POPULATION, MCH AND FP RESEARCH IN BANGLADESH

An Annotated Bibliography

Volume-Nine

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FOREWORD

Population, MCH and Family Planning Research in Bangladesh: An Annotated Bibliography, Volume-Nine is of paramount importance for proper planning of manpower at national and organizational level. This would be equally useful to the policy makers, program managers, researchers and others in order to get an information on the population and development, reproductive health as well as family planning performances, quality of care, MIS, child health, utilization of MCH-FP programs, cost effectiveness of services, women in development, nutrition, HIV/AIDS etc. The main objective of the compilation is to disseminate the results of the research studies conducted during the period of 2007 to 2010 by various organizations and institutions including individual researchers in abstract form.

Every year, an increasing number of studies are undertaken in Bangladesh, and it is often not accessible or affordable. Moreover, sharing of information in a cohesive manner will also facilitate researchers to avoid duplication and reflections of research questions in a focused manner. It is expected that this research compendium will serve the purpose of disseminating the research findings of the studies to all concerned. However, most of the researches conducted within the stated period have been included, and we convey our regrets if there have been any others that were missed in the reporting. In this context, I would encourage the active participation of professionals to contribute and use information that would be beneficial towards further development of population, nutrition, HIV/AIDS and reproductive health programs.

I express my gratefulness to those who have generously helped us by providing research reports. I also convey my heartfelt regards and thanks to the authors of this compilation particularly Dr. A. M. M. Anisul Awwal, PhD, Director (Research), NIPORT, Mohammed. Ahsanul Alam, Evaluation Specialist and Mr. Dipak Chandra Roy, Librarian who were responsible for the tedious job of compiling, abstracting and finalizing the ninth volume. Last, but not the least, thanks are due to all the authors of this document. The concerted efforts of all will be successful if the document is used by the policymakers, program managers, and researchers. Your creative criticism would help us in further development of this bibliography.

(K. C. Mondal)

ACKNOWLEDGEMENT

This state-of-the-art series of annotated bibliography is the most comprehensive and users friendly document so far available in this country on most of the issues of population, demography, family planning activities, child health and nutrition, male involvement in FP activities, met and unmet needs of contraceptives, HIV-AIDS, population in-migration etc. Most of the national and international professionals and organizations working in Bangladesh helped us in collecting studies, reports, articles, and seminar papers for the preparation of Population, MCH and Family Planning Research in Bangladesh: An Annotated Bibliography - Ninth Volume**.** Though it is not possible to acknowledge individually, nonetheless, it is my holy responsibility to extend my heartfelt regards to all of them to provide support in publishing this valuable document.

I express my deep sense of appreciation to Mr. K. C. Mondal, Director General NIPORT for his continuous encouragement, timely guidance and strong support in finalizing this annotated bibliography. In this regard, I would like to extend my heartfelt thanks to Mr. Babul Chandra Roy, Director (Admn, and Training: in-charge) for his support and encouragement. I express my sincere gratitude to all the officers of research unit of NIPORT particularly to the members of the committee Mohammed Ahsanul Alam, Evaluation Specialist and Mr. Dipak Chandra Roy, Librarian, NIPORT for compiling and editing the annotated bibliography with extreme care, caution and dedication. My regards and thanks is also due to Md. Nazmus-Sa-Adat, Library Assistant, NIPORT for providing sincere secretarial services.

It would be highly appreciated if you provide us any suggestions for further improvement of this publication in the future.

(Dr. AMM Anisul Awwal, PhD)
Director (Research)
NIPORT

Contents

ACRONYMS

AIDS	-	Acquired Immune Deficiency Syndrome
ARI	-	Acute Respiratory Infection
AFLE	-	Adolescent Family Life Education
AMC	-	Alternative Medical Care
ANC	-	Antenatal Care
ART	-	Assisted Reproductive Technology
BARD	-	Bangladesh Academy for Rural Development
BBS	-	Bangladesh Bureau of Statistics
BCCP	-	Bangladesh Centre for Communication Programs
BCC	-	Behavioral Change Communication
BDHS	-	Bangladesh Demographic and Health Survey
BIRDEM	-	Bangladesh Institute of Research and Rehabilitation, Diabetes, Endocrine and Metabolic Disorders
BIRPERHT	-	Bangladesh Institute of Research for Promotion of Essential Reproductive Health and Technologies
BMMS	-	Bangladesh Maternal Mortality Survey
BPHC	-	Bangladesh Population and Health Consortium
BRAC	-	Bangladesh Rural Advancement Committee
BSMMU	-	Bangabandhu Sheikh Mujib Medical University
BWHC	-	Bangladesh Women's Health Coalition
BMI	-	Body Mass Index
CSMF	-	Cause-specific Mortality Fraction
CCHP	-	Chakaria Community Health Project
CS	-	Civil Surgeon
CC	-	Community Clinic
CHW	-	Community Health Workers
CSBA	-	Community Skilled Birth Attendant
CAR	-	Contraceptive Acceptance Rate
CPR	-	Contraceptive Prevalence Rate
CBR	-	Crude Birth Rate
DBRHCP	-	Demand Based Reproductive Health Commodity Project
DSS	-	Demographic Surveillance System
DCC	-	Dhaka City Corporation
DPT	-	Diphtheria Pertussis Tetanus
ECP	-	Emergency Contraception Pill
EMC	-	Emergency Contraception
EMOC	-	Emergency Obstetric Care
EOC	-	Emergency Obstetric Care

ELLISA	-	Enzyme Linked Immno-sorbent Assay
FP	-	Family Planning
FPAB	-	Family Planning Association of Bangladesh
FWA	-	Family Welfare Assistant
FWC	-	Family Welfare Centre
FWV	-	Family Welfare Visitors
FGD	-	Focus Group Discussion
FBT	-	Full Brest-feeding Trajectory
GB	-	Grameen Bank
GK	-	Ganoshasthya Kendra
GDP	-	Gross Domestic Product
GOB	-	Government of Bangladesh
HA	-	Health Assistant
HDSS	-	Health and Demographic Surveillance System
HFWC	-	Health and Family Welfare Centers
HNPSP	-	Health, Nutrition & Population Sector Program
HDN	-	Hemolytic Disease of Newborn
HBV	-	Hepatitis B Virus
HCV	-	Hepatitis C Virus
HIV	-	Human-immuno Virus
IDU	-	Injecting Drug Users
IMR	-	Infant Mortality Rate
IEM	-	Information Education and Motivation
ICMH	-	Institute of Child and Mother Health
IPH	-	Institute of Public Health
IMCI	-	Integrated Management of Childhood Illness
ICDDR,B	-	International Centre for Diarrhoeal Disease Research, Bangladesh
ICPD	-	International Conference on Population and Development
IFT	-	Intermittent Feeding Trajectory
IPC	-	Inter-personal Communication
IUD	-	Intra-uterine Device
IDA	-	Iron Deficiency of Anemia
KAP	-	Knowledge, Attitude and Practice
LSE	-	Life Skills Education
LBW	-	Low-Birth Weight
MIS	-	Management Information System
MWRA	-	Married Women of Reproductive Age
MCH	-	Maternal and Child Health

MCHTI	-	Maternal and Child Health Training Institute
MCWC	-	Maternal and Child Welfare Centre
MMR	-	Maternal Mortality Rate
MR	-	Menstrual Regulation
MDG	-	Millennium Development Goal
MOHFW	-	Ministry of Health and Family Welfare
MOYS	-	Ministry of Youth and Sports
MICS	-	Multiple Indicator Cluster Survey
NID	-	National Immunization Day
NIPORT	-	National Institute of Population Research and Training
NIPSOM	-	National Institute of Preventive and Social Medicine
NNP	-	National Nutrition Program
NGO	-	Non-Government Organization
NLB	-	Non-Live Birth
NBH	-	Normal Birth Weight
NTBA	-	Non-trained Traditional Birth Attendants
NVD	-	Normal Vaginal Delivery
NEP	-	Nutrition Education Program
ORP	-	Operations Research Project
OC	-	Oral Contraceptives
OCP	-	Oral Contraceptive Prevalence
ORS	-	Oral Re-hydration Solution
ORT	-	Oral Re-hydration Therapy
OPD	-	Out-Patient Department
PRA	-	Participatory Rapid Assessment
PNC	-	Postnatal Care
PPH	-	Postpartum Hemorrhage
PRSP	-	Poverty Reduction Strategy Paper
PSU	-	Primary Sampling Unit
PST	-	Problem Solving Test
PPS	-	Proportionate for Size
PEM	-	Protein Energy Malnutrition
RH	-	Reproductive Health
RTI	-	Reproductive Tract Infection
RTM	-	Research Training and Management
SRS	-	Sample Registration System
SC	-	Satellite Clinic
SBA	-	Skilled Birth Attendant
STD	-	Sexually Transmitted Diseases

STI	-	Sexually Transmitted Infections
SMC	-	Social Marketing Company
SD	-	Standard Deviation
SACMO	-	Sub-Assistant Community Medical Officer
TT	-	Tetanus Toxoid
TFR	-	Total Fertility Rate
TIMR	-	Total Infant Mortality Rate
TBA	-	Traditional Birth Attendant
UMIS	-	Unified Management Information System
UHFWC	-	Union Health and Family Welfare Centre
UNFPA	-	United Nations Fund for Population Activities
UNICEF	-	United Nations Children Emergency Fund
UHC	-	Upazila Health Complex
UESD	-	Utilization of Essential Service Delivery
VA	-	Verbal Autopsy
VAC	-	Vitamin - A Capsule
WHO	-	World Health Organization

CHAPTER– I

INTRODUCTION TO THE BIBLIOGRAPHY

The present volume is the 9th state-of-the-art series of annotated bibliography that has been prepared with the same objective of previous bibliographies to document population and family planning studies for further dissemination of the findings to the decision makers, program managers, researchers etc. The document includes the key findings of the research works conducted during 2007-2010 by various organizations, institutions and individuals. Based on 248 studies, this annotated bibliography would provide information on population, maternal and child health and family planning activities conducted by different national and international organizations and individuals.

During preparation of this document, maximum care was taken to include all the institutions, organizations, NGOs and other entities that have had studies that satisfy our needs and objectives of publishing the document. Accordingly, 113 individual organizations including university/departments/institutions/NGOs were communicated using various means to collect the study reports that have been conducted from 2007 to 2010. Altogether 248 reports were collected from various organizations and individuals, and all have been included in this bibliography.

During selection of the studies, emphasis was given on those studies which capitalized primary source of data to prepare the study reports. Considering the importance and relevance of the papers, some study reports/articles/seminar papers were prepared from secondary data sources that are also included in this bibliography.

In this annotated bibliography, the findings of the studies have been prepared in abstract form by a cohesive manner. However, all the topics were reviewed separately, and classified as per area of domain of interest. Twelve broad areas identified through analyzing the findings and overall situation of population and family planning studies conducted during 2007-2010. The broad areas are:

- Population dynamics (fertility, mortality, morbidity etc.)
- Family planning (contraception, methods, side effects, follow-up, etc.)
- Reproductive health (maternal health, adolescent health, antenatal, post natal, delivery care, etc.)
- Child health (nutrition, breastfeeding, immunization, diarrhea, etc.)
- Utilization of health service facilities (satellite clinics, FWC, THC, EPI, etc.)
- Behavioral Change Communication (BCC)
- Management Information System (participatory management, registration, record keeping, monitoring, supervision, etc.)
- MCH-FP Personnel Evaluation (training, human resources development, performance of the workers, etc.)
- Women in development (gender issues, domestic violence, women role in decision making, mobility, etc.)

- Cost-benefit analysis - MCH & FP Services (contraceptive prices, cost-effectiveness, sustainability, etc.)
- Nutrition
- HIV/AIDS/STDs

Out of the 248 studies, 46 cover the issue of population dynamics, 26 on family planning, 46 on reproductive health, 15 on child health, 21 on utilization of health service facilities, 1 on behavioral change communication, 5 on management information systems (MIS), 5 on MCH-FP Personnel evaluation, 9 on the related issue of women in development, 10 on cost-benefit analysis-MCH-FP services, 44 on nutrition, and 20 on HIV/AIDS/STDs.

Among these studies, there are national level surveys, intervention/operation research, innovative studies, evaluative studies, journal articles, secondary data analysis and surveys.

This bibliography contains abstracts of research findings and bibliographical citations of the reports. It is arranged in an author-alphabetic order under each broad heading, e.g. citations are arranged alphabetically by the name of the first author and then by the title of the report. All the reports cited in the bibliography include abstracts. Whenever an abstract was prepared, every effort was made to include information on the objective, methodology, findings / results and recommendations of the study. An author and subject indexes are appended at the end of the main text for easy search by co-authors' name and specific subject. The numbers cited in the co-author and the subject indexes refer to the sequential numbers of the citations.

CHAPTER - II
Abstracts

2.1 POPULATOPN DYNAMICS (fertility, mortality, morbidity etc.)

001 Alam N; Haq MZ; Streatfield PK. Spatio temporal patterns of under five mortality in Matlab HDSS in rural Bangladesh. *Global Health Action*. Supplement 1, 2010; doi: P10.3402 gha. V 310.5252.

The study objective was to identify villages and periods of high under-five mortality in Matlab, Bangladesh. Estimating mortality risks in high risk villages, adjusting for village level education and economic status is another objective of the study. The HDSS in Matlab a rural area of Bangladesh, provided data on yearly number of deaths and children aged below 5 years for each of 90 villages during 1998-2007, along with village location points, longitudes and latitudes. Kulldorffs space time scan statistic was used to identify villages and periods that experienced high mortality risks in the HDSS area with a statistical significance of $p<0.001$. Logistic regression was conducted to examine if village level education and economic status explained village level mortality risks. There were 3,434 deaths among children aged below 5 years in the HDSS area during 1998-2007 with am average yearly rate of 13 deaths per 1,000 under five child-years. The mortality rate showed a declining trend with high concentration in 1998-2002, but not in 2003-2007. Two clusters of villages had significantly higher mortality risks in 1998-2002, but not later and the mortality risks in the high risk clusters reduced little, but remained significant after controlling for adult education and economic status at village level. The reduction is also indicated by the deviance between the two log likelihood, which is distributed as chi-square and is found significant. In conclusion, the findings indicated that spatial disparity observed in childhood mortality in the HDSS area in 1998-2002 has disappeared in recent years in which there have been lower mortality rates.

002. Alam N; Ginneken JKV; Bosch AM. Infant mortality among twins and triplets in rural Bangladesh in 1975-2002. *Tropical Medicine and International Health*. 2007 Dec.; 12 (12): 1506-1514.

This study was undertaken to investigate the incidence of multiple births (MB) and related factors; levels and trends in infant, neonatal and post neonatal mortality of twins and triplets; and determinants of infant, neonatal and post neonatal mortality of twins and triplets. The study used population based, longitudinal data derived from the Health and Demographic Surveillance System in Matlab, Bangladesh, from 1975 to 2002. Logistic regression was applied to determine the impact of a number of variables on mortality among MB in the first year of life. The study revealed that multiple births averaged 2% of all live births but contributed 10% to all infant deaths. Infant mortality among PIB was ore than five times higher than among singletons. Mortality among Matlab Baseline decline by 27% in 1975-2002, considerably less than the 51% mortality decline among single tons in the same period. Infant mortality among twins and triplets was particularly high among children who were born to young mothers (<20 years), who were the first live birth, who were born after a short birth interval (<24 months) and whose mothers were unschooled. Mortality of MB was lower in the area with easy accuse to high quality maternal and child care services. The infant mortality of twins and triplets was nearly seven times higher than that of single tons (356 vs. 53 per 1000 live births in 1995-2002), and it was eight times higher in the neonatal period. The study made two recommendations on future studies on determinants of infant mortality. The first is that the variable type of pregnancy on delivery be included; the

second is that such studies pay more attention to antenatal and intrapartum factors and birth weight. More over good maternity and newborn care will improve the survival of multiple births.

003. Alo D; Shahidullah M; Mannan MA; Noor K. Effect of parenteral amino acid supplementation in preterm low birth weight newborn. ***Mymensing Medical Journal.*** **2010 July; 19(3): 386-390.**

This study was undertaken to determine the effect of parenteral amino acid supplementation on weight change, biochemical effect and incidence of sepsis in preterm low birth weight newborns during their hospital stay. It was carried out during time period of June 2006-May 2007 in the newborn unit of a tertiary care hospital of Bangladesh. Sixty preterm (28-34 weeks), low birth weight (I000-I800g) AGA (appropriate for gestational age) newborns were enrolled within 24 hours of birth. Intervention and control newborns were matched in terms of birth weight per and gestational age. Samples were volunteers. Parental amino acid (5%) supplementation in addition to usual nutritional management until central feeding reached three-fourth of total calorie intake as mortality rates of these high risk preterm newborns continue to fall; optimizing nutritional care has become an important topic of clinical research[3]. Special considerations regarding nutrient needs of premature infants arise at birth because of limited body stores. Usual nutritional management was 10% intravenous dextrose and subsequent enterable weight change was observed by two parameters such as mean percentage of maximum postnatal weight loss and mean days to reach birth weight, both were significantly lower in intervention than control group ($p<0.05$). Biochemical effect of parenteral amino acid supplementation investigated in this study has been shown to have no effect. There was no difference in incidence of sepsis between intervention and control group ($p>0.05$). Improved nutritional supplementation with parenteral amino acids resulted in better growth as evident by lesser degree of weight loss and earlier regaining of birth weight in the early neonatal period. Biochemical parameters are not affected by potential amino acid supplementation. It is therefore imperative that anemia control program in vulnerable population groups are to be augmented.

004 Amouzou A; Richard SA; Friberg IK; Bryce J; Baque AH; Arifeen SE; Walkar N. How well does list capture mortality by wealth quintile? A comparison of measured versus modeled mortality rates among children under five in Bangladesh. ***International Journal of Epidemiology.*** **2010 ; 39: 1186-1192.**

The aim of this study was to determine whether list products valid estimates for wealth subgroups within a population, allowing users to compare alternative program scenarios based on the extent to which they would differently prevent child deaths among the poorest populations. The study used list to model neonatal and under-5 mortality level, among the highest and lowest Health Quintiles in Bangladesh based on national and, wealth quintiles specific coverage of child survival interventions. The cause of death structure among children under 5 was also modeled using the coverage levels. Modeled rates were compared to the rates measured directly from the 2004 Bangladesh Demographic and Health Survey and associated verbal autopsies. The study results indicated that modeled estimates of mortality within wealth quintiles fell within the 95% confidence intervals of measured mortality for both neonatal and post neonatal mortality. List also performed well in predicting the cause of death structure for these two age groups, for the poorest quintile of the population but less well for the richest quintile, Agreement for the wealthiest quintile was less good, with the modeled estimate of deaths due to asphyxia falling 17.1% point below the measured estimates and the modeled estimates for death due to pre maturity and other causes falling 6.3 and 8.6 percentage prints above the measured estimates respectively. With list predicting 17.1 percentage points more pneumonia deaths than measured and 14.5 percentage

points fewer diarrhea deaths. The study results recommended that program planners can consider alternative scenarios and List to assess the extent to which they are pro-poor and will contribute to readdressing in equities in mortality by wealth status.

005 Anonymous. Health and demographic surveillance system-Matlab vol. 40: registration of health and demographic events 2006. Dhaka: ICDDR, B, 2008. (Scientific report; no. 103)

The objective of the HDSS of Matlab was to estimate the registration of births, deaths, and migrations, in addition to carrying out periodical censuses. This report presents the vital registration and maternal and child health data gathered from Matlab, Bangladesh in 2006. The data were collected by the health and demographic surveillance system of ICDDR, B. In the surveillance area, as a whole, fertility remained the same in 2006 compared to 2005. Then crude birth rate was 22.8 per 1000 population and total fertility rate (TFR) was 2.7 per woman in 2006, almost similar to 2005 rates. In the ICDDR, B service area CBR was 22.9 and TFR was 2.7 and in Government service area, CBR and TFR were 22.7 and 2.8 respectively. The crude death rate was 6.3 per 1000 population in the ICDDR, B service area and in the Government service area it was 6.4 in 2006. The infant mortality rate was 29.7 per 1000 live births in the ICDDR, B service area; post-neonatal mortality decreased in the ICDDR, B service area and in the Government service area it was 40.4. The neonatal mortality fell in both areas; post neonatal mortality decreased in the ICDDR, B service area and increased in the Government service area. The mortality rate among children aged less than 5 years has decreased from 45.3 in 2005 in the ICDDR,B service area to 41.9 in 2006, and in the Government service area, the reduction was from 60.2 in 2005 to 50.7 in 2006.The rate of natural increase in population size was 16.5 per 1,000 in 2006. The rate of migration increased 43.5 per 1,000 populations in 2006 from to 35.7 in 2005, and the rate of out-migration also increased to 57.3 in 2006 from 53.3 in 2005. The overall annual population growth rate was 0.3%. The marriage rate was 13.9 per 1,000 populations and the divorce rate was 99.2 per 1,000 marriages.

006 Anonymous. The annual reports of the Chakaria Health and Demographic Surveillance System (Chakaria HDSS). Dhaka, ICDDR, B 2008.

The purpose of this study was to make awareness of the health and demographic surveillance system of Chakaria. Chakaria is one of the 465 upazilas (Sub-districts) in Bangladesh. It is located between latitudes 21”34 North and longitudes 91”54’ and 92”13’ East in the southeastern coast of the Bay of Bengal. Administratively, it is under Cox’s Bazaar district with a population of around 410,770 in 2006. The highway from Chittagong to Cox’s Bazaar passes through Chakaria. The focus of the activities has been to facilitate local initiatives for the improvement of health of the villagers in general and of children, women, and the poor in particular. Thus, the activities of the project have been participatory with emphasis on empowering the people by raising awareness about health, inducing positive preventive behavior through health education, and providing technical assistance to any health initiatives taken by the village-based indigenous self-help organizations. The Chakaria HDSS covered 8 unions Baraitali, Kayerbil, Bheola Manik Char, Paschim Boro Bheola, Shahar bil, Kakara, Harbang, and Purba Boro Bheola. Of these, the last two unions formed the comparison area, and the first 6 formed the intervention area. In 1999, 106,320 people were living in 20,252 households in the intervention area and 34,418 people were living in 6,727 households in the comparison area. The Chakaria HDSS started in 1999 covering all the households in 8 unions; data collection was interrupted during 2001-2003. Since 2004, quarterly data collection has resumed and data are being collected from 3,727 and 3,315

systematically randomly-chosen households in the intervention and comparison areas respectively. 24 field-trained workers collected data during 2006. The data collectors were provided with written instructions for specific questions that required added explanations. Six supervisors supervised the data-collection process. To detect any anomalies, the supervisors re-visited 5% of the households, chosen randomly, within 2 days of data collection by the field workers. The age-sex composition is similar for all age-groups excepting the 20-24 years age group (55% male vs. 45% female). One of the possible causes of the low proportion of females in the 20-24 year age group is the out migration of women of this age group from Chakaria. The health –related activities of ICDDR, B in Chakaria included facilitation of provision of safe motherhood services by the trained midwives who were based in the seven village health posts that had been established and managed by the villagers since the late nineties. The services provided by these midwives were not strictly restricted to the intervention area. The women from the comparison area also availed their services to some extent. A facility level index for the users' households was calculated from the asset data obtained from the users, using the weights associated with various assets derived from the Chakaria HDSS household data collected in 2006. The households of the users of the facilities were also divided into five groups on the basis of asset index scores using the cut off points of quintiles for the community. Proportions of users of the facilities in various asset quintiles were compared with those of the communities.

007 Arifeen SE. Child health and mortality. *J Health Popul Nutr.* 2008 Sep; 26(3): 273-279.

This paper was written to examine the situation of child health and mortality in Bangladesh. Bangladesh has the target to achieve the Millennium Development Goal (MDG) 4 relating to child mortality. There have been very rapid reductions in mortality, especially in recent years and among children aged over one month. However, this rate of reduction may be difficult to sustain arid may impede the achievement of MDG 4. Neonatal deaths now contribute substantially (5 7%) to overall mortality of children aged less than five years, and reductions in neonatal mortality are difficult to achieve and have been slow in Bangladesh. There are some interesting attributes of the mortality decline in Bangladesh. Mortality has declined faster among girls than among boys, but the poorest have not benefited from the reduction in mortality there has also been a relative absence of a decline in mortality in urban areas. The age and cause of death pattern of under-five mortality indicate certain interventions that need to be scaled up rapidly and reach high coverage to achieve MDG in Bangladesh. These include skilled attendance at delivery postnatal care for the newborn, appropriate feeding of the young infant and child, and prevention and management of childhood infections. The latest. (2007) Bangladesh Demographic and Health Survey showed that Bangladesh has made sustained and remarkable progress in many areas of child health. More than 80% of children are receiving all vaccines. The use of oral rehydration solution for diarrhea is high, and the coverage of vitamin A among children aged 9-59 months has been consistently increasing. However, poor quality of care, misperceptions regarding the need for care and other social barriers contribute to low 1es of care-seeking for illnesses of the newborns and children. Improvements in the health system axe essential for removing these barriers, as are effective strategies to reach families and communities' with targeted messages and information. Finally, there are substantial health-system challenges relating to the design and implementation, at scale, of interventions to reduce neonatal mortality.

008 Ashrafunnessa; Khatun S; Islam MN; Rashid MH. Seroprevalence of cytomegalovirus antibody in antenatal population in Bangladesh. *Bangladesh Med Res Counc Bull*. 2009; 35:110-116.

The study was undertaken to analyze the cytomegalovirus antibody in antenatal population in Bangladesh, This kind of virus shedding occurs in different components of the body find as saliva, urine, few blood semen cervical section and breast milk. For conducting this study, blood was randomly collected from 420 pregnant women of age between 15-45 years (irrespective of gestational age) attending the obstetrics outpatient department from July 2002 to May 2003. Samples were analyzed for cytomegalovirus antibodies (IgG and IgM) by Enzyme Linked Immunosorbent Assay (ELISA) in the virology Department of BSMMU, Data analysis was done by using SPSS. Statistical test (x) were performed and p value <0.05 were considered significant. Among the 420 pregnant women, 288 (68.6%) were cytomegalovirus IgG sero-positive and 21 (5.0%) women were cytomegalovirus IgG seropositive cases 19 (6.6%) were also seropositive for cytomegalovirus IgM. Two of the 132 seronegative cases for cytomegalovirus IgG were positive for cytomegalovirus IgM. The prevalence of cytomegalovirus IgG antibody was 66.7% by the age of 15 to 20 years. It gradually increased with age and became 71.4% in the age group of 26-30 yrs. Then the seropositivity showed some decline to 66.1% in the age group of > 31 years and above. High seroprevalence (68.6%) of cytomegalovirus infection among the study population indicates the necessary of good sanitary and hygiene practices among the pregnant population. In this study, 32% of the women were cytomegalovirus IgG seronegative and were susceptible to primary cytomegalovirus infection during pregnancy. As age, education, occupation, parity socioeconomic condition does not have significant association with cytomegalovirus seroprevalence; all women of reproductive years need counseling. The study suggested that pregnant women should avoid public places and maintain good hygiene.

009 Baqui AH; Ahmed S; Arifeen SE; Darmstadt GL; Mannan I; Rahman SM; Begum N; Mahmud ABA; Seraji HR; Williams EK; Winch PJ; Santosham M; Black RE. Effect of timing of first postnatal care home visit on neonatal mortality in Bangladesh: an observational cohort study. *BMJ*. 2009;339:2826.

The objective of the study was to assess the effect of the timing of first postnatal home visit by community health workers on neonatal mortality. Analysis of prospectively collected data using time varying discrete hazard models to estimate hazard ratios for neonatal mortality according to day of first postnatal home visit. Data from a community based trial of neonatal care interventions conducted in Bangladesh during 2004-2005. The study found in the results that 9211 live births were included here Among infants who survived the first day of life, neonatal mortality was 67% lower in those who received a visit on day one than in those who received no visit (adjusted hazard ration 0.33, 95% confidence interval 0.23 to 0.46; p< 0.001). For those infants who survived the first two days of life, receiving the first visit on the second day was associated with a 64% lower neonatal mortality than in those who did not receive a visit (adjusted hazard ration 0.36, 0.23 to o.55; p<0.001). First visits on any day after the second day of life were not associated with reduced mortality. In developing countries, especially where home delivery with unskilled attendants is common, postnatal home visits within the first two days of life by trained community health workers can significantly reduce neonatal mortality.

010 Bhuiya A; Hanifi SMA; Mahmud SS. Chakaria health and demographic surveillance system focusing on the poor and vulnerable: demographic profile, family-planning use, and safe motherhood practices-2005. Dhaka: ICDDR'B. 2007.

The primary purpose of this surveillance system is to monitor the impact of intervention with equity focus and generate relevant health, demographic and socioeconomic information for further research. This report presents data collected through the HDSS during 2005. However, data on safe motherhood practices and family planning indicators cover the period from April 2004 through December 2005. The Chakaria HDSS started in 1999 covering all the households in 8 Unions, data collection was interrupted during 2001-2003. Since 2004, quarterly data collection has resumed, and data are being collected from 3,727 and 3,315 systematically randomly-chosen households in the intervention and comparison areas respectively. For 2005 Chakaria HDSS, 24 field-trained workers collected data and six supervisors supervised the data collection process. The major demographic indicators and safe motherhood related practices have been tabulated for the various asset quintiles. The study results found that a declining trend in the mortality and fertility indicators and natural rate of increase has been observed during 1999-2005 with an exception in growth rate. The crude death rate for the intervention and comparison areas in Chakaria when considered together was 6.1 per 1,000 populations in 2005. The rate was higher in the comparison area than in the intervention area. Infant mortality rate for all the villages in the intervention and comparison areas was 48.9 per 1,000 live-births with a lower rate in the intervention area than in the comparison area. Child mortality rate was 6.6 per 1,000 children aged 1-4 years. Data showed that the number of people migrating in and out during 2005 was almost equal in both the areas. In Chakaria, 37% 0f 4,975 currently married couples of reproductive age used modern family planning methods in 2005. This was a considerable increase from 25% in 1999. During 2005, 59% of 2,349 pregnant women in Chakaria received at least one antenatal check up. The percentage of women receiving ANC was higher in the intervention area (65%) than in the comparison area (52%). An analysis of rate of under-5 mortality by their socioeconomic status showed that the rate decreased with increasing socioeconomic status and that it was higher among the lowest socioeconomic group (104 per 1,000 live-births). Regarding the use of antenatal care services, the concentration index in the comparison are 0.11, which was higher than (0.9) of the intervention area.

011 Bhuiya A; Hanifi SMA; Urni F; Iqbal M. Chakaria health and demographic surveillance system focusing on the poor and vulnerable: demographic events and safe motherhood practices - 2007. Dhaka: ICDDR'B, 2008. (Scientific report; no. 105).

The primary purpose of this surveillance system is to monitor the impact of intervention with equity focus and generate relevant health, demographic and socioeconomic information for further research. This report presents data collected through the HDSS during 2007. However, data on safe motherhood practices and family planning indicators cover the period from 2004 through 2007. The Chakaria HDSS started in 1999 covering all the households in 8 Unions, data collection was interrupted during 2001-2003. Since 2004, quarterly data collection has resumed, and data are being collected from 3,727 and 3,315 systematically randomly-chosen households in the intervention and comparison areas respectively. For 2007 Chakaria HDSS, 26 field-trained workers collected data and six supervisors supervised the data collection process. The major demographic indicators and safe motherhood related practices have been tabulated for the various asset quintiles. The study results found that a declining trend in the mortality and fertility indicators and natural rate of increase has been observed during 1999-2007. The crude death rate for the intervention and comparison areas in Chakaria when considered together was 6.0 per 1,000

populations in 2007. The rate was higher in the comparison area than in the intervention area. Infant mortality rate for all the villages in the intervention and comparison areas was 48.0 per 1,000 live-births with a lower rate in the intervention area than in the comparison area. Child mortality rate was 4.6 per 1,000 children aged 1-4 years. Data showed that the number of in-migrants was lower than of out-migrants during 2007 in both the areas. In total, 819 marriages took place in the surveillance households in Chakaria during 2007. During 2007, 64.9% of 1,208 pregnant women in Chakaria received at least one antenatal check up. The percentage of women receiving ANC was higher in the intervention area (67.3%) than in the comparison area (61.7%). It was observed that only 40% of the pregnant women received at least one postnatal care (PNC) during 2007. In Chakaria, the Traditional Birth Attendants (TBAs) were more popular than the skilled birth attendants (SBAs) for assisting deliveries. Eighty one percent of 1208 deliveries in Chakaria were assisted by the TBAs as opposed to 19% of the deliveries assisted by the SBAs (e.g. nurses/doctors, FWVs, midwives). The percentage of deliveries assisted by the TBAs was slightly higher in the comparison area (81.8%) than the intervention area (79.6%). The women from the households in the highest asset quintile had a much higher rate of facility based delivery than those from the lowest quintile.

012 Bhuiya A; Rahman MS. A Simple analysis of recent trends in total fertility rates in Bangladesh: what can the family planning program do to reinitiate fertility decline. Dhaka: ICDDR, B, 2007. (Scientific report; no. 98).

This study was confirmed to examine the proportion of unwanted births and use of family-planning methods among couples with less than four and four or more living children in rural and urban Bangladesh. The study used the data from the Bangladesh Demographic and Health Surveys (BDHS) and Health and Demographic Surveillance System (HDSS) of Matlab ICDDR, B program. The paper is also based on data from all currently-married women aged 10-49 years included in the surveys for the analysis of trends. Analysis of factors associated with use of family planning was based on data from 2.184 rural and 413 urban women with three or more surviving children at the time of the 1999-2000. Results of the study showed that 95% couples with more than three living children did not want an additional child. The contraceptive use rate among them was only around 50%. Thus, by catering to the needs of this motivated group of high-parity couples who contribute to 30% of total births in the country, the total fertility rate can be reduced to around 2,5. In this context, establishing frequent contacts with couples can be of help us as was the case with increasing the overall use of family planning methods. Targeting high parity couples will require identification of couples, which should be straightforward. The possible strategies for targeting high-parity couples through the existing service delivery system are also discussed in the paper. It would however, be important to monitor the rate of family planning use among low-and high-parity couples to discover any unexpected shift in use rates if greater attention is given to high-parity couples.

013 Bhuiyan RH; Rahman S; Sattar MA; Rashid MA; Shamsuddoha M; Latif KA; Kabir-uddin S. Factors related to early marriage in rural Bangladesh. Dhaka: NIPORT & ARTCOP, 2010.

The study was conducted with the specific objectives to: i) examine socio-economic factors related to early age at marriage, ii) assess the level of awareness among community about consequences of early marriage, iii) assess attitude of the community about early marriage, and iv) suggest appropriate ways and means to reduce early age at marriage. Study population has considered all the married women aged below 18 years, adolescent girls 12-19 years,

father/mother of the married young women and community members (teacher, religious leader, UP Chairman, Member (male and female) local elite etc. The study has taken total of 1056 samples (352 married women of age below 18 year, 352 adolescent girls of age 14-18 years, 352 father/mothers) have considered for interview. The study resumes that the estimates of interest has within 0.05 of the true value with a Cl of 95%. The study showed that less than 20 years of married women's mean age at marriage is 15.73 years and more than 20 years women is 20.50 years. About 73% women married between 20-24 years, but 74.6% women of fewer than 20 years of were found between 15-19 years. Overall mean age at marriage is 17.77 years. One fifth of the respondents were illiterate, 35% had primary education and 30% had secondary level. Respondent's occupations are mostly house wife (90.0%) for married women. Mean monthly family income of the adolescent respondent's is 12,000 Taka and mean yearly income is 56,000 Taka. A good majority (61.0%) of under 20 years respondent said that 15-19 years is the best time of marriage but 57.9% (>20 years) noted that 20-24 years was the most appropriate time of marriage. According to the govt. rule mean age at marriage is 21.6 for boys and 19.4 for girls. Regarding early marriage more than 16% under 20 years respondent not heard about early marriage but more that 20 years almost all (97.5%) respondent are aware about early marriage in the community. Highest majority (61.9%) of adolescents heard about early marriage from Radio/TV sources. Second majority (29.8%) is the UHC/FWC. Findings also showed that majority respondents (84%) identify that poverty is the main cause of early marriage in our society. Problems of early marriage, interesting findings have been observed that excessive bleeding/rupture of uterus/burning in uterus/displacement of uterus is the more or less common adolescent problems (11.2%). On specific major service centre form where the respondents usually get services were FWC 952%), UHC (48%), Satellite Clinics/Clinics (25%), BRAC center (25%), and *Surjer Hashi* (19%). Quality health service may also helps to reduce/stop early marriage. The study recommended that awareness pf the community people should be increased and female education, women empowerment, participation of the school teachers/imam/elite to uphold the people's sentiment against the stalking. Awareness should be grown up through mass media, print media, etc. to understand bad affect and health problems of young women/mother and finally, law should be imposed in a more effective way to prevent early marriage.

014 Black MM; Baqui AH; Zaman K. Arifeen SE ; Black RE. Maternal depressive symptoms and infant growth in rural Bangladesh. *American Journal of Clinical Nutrition.* 2009; 89 (Supple): 1S-7S.

The study was initiated to examine the association of maternal depressive symptoms and infant growth among infants in rural Bangladesh and to examine how the relation is affected by infant irritability and care giving practices. Infant growth was measured among 221 infants at 6 and 12 months. Mothers reported their depressive symptoms and perceptions of their temperament, and a home observation of care-giving was conducted. The study results showed that at 6 mo, 18% of infants were stunted (length-for-age<-2 z scores) At 12 mo, 36.9% of infants were stunted; infants of mothers with depressive symptoms had a 2.17 higher odds of being student (95% CI: 1.24, 3.81; P=0.007) than did infants of mothers with few symptoms (45.3% compared with 27.6%). In a multivariate regression analysis, maternal depressive symptoms were associated with 12-mo length-for-age, adjusted for 6-mo length-for-age, maternal education, infant sex, birth order, receipt of iron and zinc, months' breastfed, maternal perception of infant temperament, and care-giving observations. Maternal depressive symptoms were not related to 12-mo weight-for-length. The relation between depressive symptoms and infant growth was not moderated by maternal perceptions of infant temperament, but was partially mediated by care-giving. The findings of the study also showed that infants of mothers with depressive symptoms in Bangladesh experience

poor linear growth may extend to other low-income countries with high rates of food insecurity. Interventions to promote growth in infants should include prevention or treatment of maternal depressive disorders and strategies to ensure adequate food security.

015 Chowdhury HR; Thompson S; Ali M; Alam N; Streatfield PK. Causes of neonatal deaths in a rural sub-district of Bangladesh: implications for intervention. *J Health Popul Nutr.* 2010 Aug; 28 (4): 375-382.

This paper describes the results of a vernal autopsy study, particularly the direct cause of death and its timing carried out on all neonatal deaths during 2003-2004 in a rural sub-district of Bangladesh. The study was carried out in Matlab, a rural sub-district in eastern Bangladesh, where a population based demographic surveillance system, run by the ICDDR,B, recorded live births and neonatal deaths during 2003-2004 among a population of 224,000 living in Matlab, Bangladesh. Deaths were investigated using the INDEPTH/WHO verbal autopsy. Three physicians independently reviewed data from verbal autopsy interview to assign the cause of death. There were 11,291 live births and 365 neonatal deaths during the two-year period. The results of the study showed that the neonatal mortality rate was 32.3 per 1,000 live births. Thirty-seven percent of the neonatal deaths occurred within 24 hours, 76% within 0-3 days, 84% within 0-7 days, and the remaining 16% within 8-28 days. Birth asphyxia (45%), pre-maturity/low birth weight (15%), sepsis/meningitis (12%), respiratory distress syndrome (7%), and pneumonia (6%) were the major direct causes of death in the early neonatal period while meningitis/sepsis (48.3%) was the single largest category in the late neonatal period. The high proportion of deaths during the early neonatal period and the far-higher proportion of neonatal death caused by birth asphyxia compared to the global average (45% vs. 23-29) indicate the lack of skilled birth attendance and newborn s and management of low-birth weight/premature babies need to be at the core of neonatal interventional packages in rural Bangladesh. Therefore, substantial reduction in neonatal mortality requires health programs combined with other socio-economic development activities for the population that facilitate individual and community control over factors determining health.

016 Chowdhury HR; Thompson SC; Ali M; Alam N; Yunus M; Streatfield PK. A Comparison of physicians and medical assistants in interpreting verbal autopsy interviews for allocating cause of neonatal death in Matlab, Bangladesh: can medical assistants be considered an alternative to physicians?. *Population Health Metrics.* 2010; 8(23): 1-22.

This study was undertaken to assess the agreement between medical physicians in their interpretation of verbal autopsy (VA) interview data for identifying causes of neonatal deaths in rural Bangladesh. The study was carried out in Matlab, a rural sub-district in eastern Bangladesh. Trained persons conducted the VA interview with the mother or another family member at the home of the deceased. Three physicians and a Medial Assistant (MA) independently reviewed the VA interviews to assign causes of death using the International Classification of Disease-Tenth Revision (ICD-10) codes. A Physician assigned cause was decided when at least two physicians agreed on a cause of death. Cause-specific mortality fraction (CSMF), kappa (k) statistic, sensitivity, specificity, and positive predictive values were applied to compare agreement between the reviewers. The study findings showed that of the 365 neonatal deaths reviewed, agreement on a direct cause of death was reached by at least two physicians in 339 (93%) of causes. Physician and Medical Assistant reviews of causes of death demonstrated the following levels of diagnostic agreement for the main causes of deaths: for birth asphyxia the sensitivity was 84%, specificity 93%, and kappa 0.77. For prematurely/low birth weight, the sensitivity, specificity, and kappa

statistics were respectively, 53%, 96%, and 0.55, for sepsis/meningitis they were 48%, 98%, and 0.55, and for pneumonia they were 75%, 94%, and 0.51. This study revealed a moderate to strong agreement between physician- assigned and Medical Assistant assigned major causes of neonatal heath. A well-trained MA could be considered an alternative for assigning major uses of neonatal deaths in rural Bangladesh and in similar settings where physicians are scarce and their time costs more. A Validation study with medically confirmed diagnosis will improve the performance of VA for assigning cause of neonatal death. However, the study did not examine the factors affecting the MA's performance and this could be explored at greater in future research. Much larger numbers of trained MAs need to be assessed for their capability to do this before their employment in such positions would be justified.

017 Chowdhury ME; Ahmed A; Kalim N; Koblinsky M. Causes of maternal mortality decline in Matlab, Bangladesh. *J Health Popul Nutr.* 2009 April; 27 (2): 108-123.

The objective of the study was to investigate the possible causes of the maternal mortality decline in Matlab. The study analyzed 769 maternal deaths and 215,779 pregnancy records from the Health and Demographic Surveillance System (HDSS) and other sources of safe motherhood data in the ICDDR, B. and government service areas in Matlab during 1976-2005. The major interventions that took place in both the areas since the early 1980s were the family-planning program plus safe menstrual regulation services and safe motherhood interventions (midwives for normal delivery in the ICDDR, B service area from the late 1980s and equal access to comprehensive emergency obstetric care [EmOC] in public facilities for women from both the areas. National programs for social development and empowerment of women through education and micro-credit programs were implemented in both the areas. The quantitative findings were supplemented by a qualitative study by interviewing local community care providers for their change in practices for maternal healthcare over time. After the introduction of the safe motherhood program, reduction in maternal mortality was higher in the ICDDR, B service area (68.6%) than in the government service area (50.4%) during 1986-1989 and 2001-2005. Reduction in the number of maternal deaths due to the fertility decline was higher in the government service area (30%) than in the ICDDR, B services area (23%) during 1979-2005. In each area there has been substantial reduction in abortion-related mortality–86.7% and 78.3%-in the ICDDR, B and government service areas respectively. Education of women was strong predictor of the maternal mortality decline in both the areas. Possible explanations for the maternal mortality decline in Matlab are: better access to comprehensive EmOC services, reduction in the total fertility rate, and improved education of women. To achieve the Millennium Development Goal 5 targets, policies that bring further improved comprehensive EmOC, strengthened family-planning services, and expanded education of females are essential.

018 Chowdhury ME; Botlero R; Koblinsky M; Saha SK; Dieltiens G; Ronsmans C. Determinants of reduction in maternal mortality in Matlab, Bangladesh: a 30-year cohort study. *Lancet.* 2007 Oct; 370: 1320-1328.

The study aim was to assess the contribution of intervention strategies, such as skilled attendance at birth, to the recorded reduction in maternal mortality in Matlab, Bangladesh. It was also intended to examine and compare trends in maternal mortality in two adjacent areas over 30 years, by separate analyses of causes of death, underlying socio-demographic determinants, and areas and time periods in which interventions differed. The study analyzed survey data that was routinely collected between 1976 and 2005 for about 200,000 inhabitants of Matlab, in Bangladesh, in adjacent areas served by either the ICDDR, B or by the government. It used

logistic regression to assess time trends in maternal mortality and separately analyzed deaths due to direct obstetric-causes, abortion-related causes, and other causes. The study findings showed that maternal mortality fell by 68% in the ICDDR, B service area and by 54% in the government service area over 30 years. Maternal mortality remained stable between 1976 and 1989 (crude annual OR 1.00 [0.98—1.01]) but decreased substantially after 1989 (OR 0.95 [0.93-0.97]). The speed of decline was faster after the skilled-attendance strategy was introduced in the ICDDR, B service area in 1990 (p=0.09). Abortion-related mortality fell sharply from 1990 onwards (OR 0.91 [0.86-0.95]). Educational differentials for mortality were substantial; the OR for more than 8 years of schooling compared with no schooling was 0.30 (0.21-0.44) for maternal mortality and 0.09 (0.02-0.37) for abortion mortality. The fall in maternal mortality over 30 years occurred despite a low uptake of skilled attendance at birth. Part of the decline was due to a fall in abortion-related deaths and better access to emergency obstetric care; midwives might also have contributed by facilitating access to emergency care. Investment in midwives, emergency obstetric care, and safe pregnancy termination by manual vacuum aspiration have clearly been important However additional policies, such as those that bring about expansion of female education, better financial access for the poo1 and poverty reduction, are essential to sustain the successes achieved to date.

019 Chawdhury RH; Chowdhury Z. Maternal mortality in rural Bangladesh: lessons learned from Gonoshasthaya Kendra program villages. *Asia-Pacific Population Journal*. 2008; 23 (1): 55-78.

The Purpose of this monograph was to highlight the achievements of maternal and child health related MDGs targets and their underlying factors, particular by in reducing maternal mortality and to examine differences in levels and trends of maternal mortality. In this monograph, a panel data sot was used to examine the patterns, causes and determinants of maternal deaths. The panel data consist of those who had conceived and delivered between 15 April 2002 and 14 April 2005. The data were collected by Gnoshosthya Kendra (GK) field level health workers as apart of routine monitoring. The study findings revealed that non availability of required services at the first level health care facility explains more than 50% percent of PPH and eclipse-related death underscores the need for stronger first level health care facilities (union health and family welfare centers) with appropriately trained staff and basic emergency obstetric services The findings again confirmed that one third of the maternal deaths due to pregnancy and childbirth related complications result from a delay in seeking care underscore & the need to raise community awareness, including that of family decision makers on the likely adverse consequences of pregnancy and child birth if timely carries not sought. The findings showed that over 80 percent of births are being delivered safely by trained birth attendants at home clearly indicates that much can be achieved in the absence of skilled birth attendants on doctors in rural setting if well-trained low-cost traditional birth attendants. This highlights the importance of trained traditional birth attendants in improving maternal and child health in rural settings. Of the 616 adult female deaths 86 (14 percent) were identified as maternity related that is occurring during pregnancy or within 42 days of the end of the pregnancy, Over three out of five pregnant women (60.5%) died during the postpartum period, nearly one in three (32.5%) during pregnancy most (27.9%) at 24 weeks or later and the remaining 7% during the labor. Compared with GK area ANC related services at national level are considerably lower, For example, all pregnant mothers (100%) in GK area received ANC services during their last pregnancies, compared with only 47.6% for the country as a whole. Only 21% pregnant women in Bangladesh received three or more ANC visits, compared with 91% woman in GK area for the last pregnancy. So therefore the grassroots level government health officials should be engaged in rendering basic maternal and child care services similar to

those performed by GK paramedics under the close supervision of elected local government officials. In another thing could be noted that these govt. paramedics (and their supervisors) must be hold accountable to the communities they serve.

020 Darmstadt GL; Choi Y; Arifeen SE; Bari S; Rahman SM. Evaluation of a cluster randomized controlled trial of a package of community-based maternal and newborn interventions in Mirzapur, Bangladesh. *PLos One.* 2010 March; 5(3): 1-13.

The study was conducted for determining a cluster-randomized controlled trial to examine its impact on knowledge and practice of newborn care and neonatal mortality. The study was done at Mirzapur in Bangladesh. All eligible women of reproductive age were participated in this study. In the intervention arm, community health workers identified pregnant women; made two antenatal home visits to promote birth and newborn care preparedness; made four postnatal home visits to negotiate preventive care practices and to assess newborns for illness; and referred sick neonates to a hospital and facilitated compliance. Primary outcome measures were antenatal and immediate newborn care behaviors, knowledge of danger signs, care seeking for neonatal complications, and neonatal mortality. A total of 4616 and 5241 live births were recorded from 9987 and 11153 participants in the intervention and comparison arm, respectively. The findings of the study revealed that high coverage of antenatal (91% visited twice) and postnatal (69% visited on days 0 or 1) home visitations was achieved. Indicators of care practices and knowledge of maternal and neonatal danger signs improved. Adjusted mortality hazard ratio in the intervention arm, compared to the comparison arm, was 1.02 (95% Cl; 0.80-1.3) at baseline and 0.87 (95% Cl; 0.68-1.12) at end-line. Primary causes of death were birth asphyxia (49%) and prematurely (26%). No adverse events associated with interventions were reported. Lack of evidence for morality impact despite high program coverage and quality assurance of implementation and improvements in targeted newborn care practices suggest the intervention did not adequately address risk factors for mortality. The level and cause-structure of neonatal mortality in the local population must be considered in developing interventions. Programs must ensure skilled care during childbirth, including management of birth asphyxia and prematurely, and curative postnatal care during the first two days of life, in addition to essential newborn care and infection prevention and management. Barriers to care seeking for illness must be addressed and adaptation of intervention for extremely preterm infants for use at community clinic must be prioritized. .

021 Eneroth H; Persson LA; Arifeen SE; Ekstrom EC. Infant anemia is associated with infection, low birth weight and iron deficiency in rural Bangladesh. *Acta Paediatrica.* 2010; 10: 1-6.

The study was conducted to estimate the prevalence of infant anemia and its association with iron deficiency, growth, infection and other micronutrient deficiencies. The study used the data from MINIMat, a randomized maternal and micronutrient supplementation trial, the study assessed the associations between anemia (hemoglobin<105g/L) in 580 infants at 6 months and deficiencies of iron, vitamin A, vitamin B12, zinc and folate, infection and anthropometric indices. Variables associated with anemia in bivariate analyses were evaluated in logistic regression models, adjusting for potential confounders. The results of the study found that anemia was found in 46% of the infants, and among these, 28% had iron deficiency (plasma ferritin <9 µg/L). Elevated C-reactive protein (>10 Mg/L) (OR=2.7, 95% CI: 1.6, 4.7), low birth weight (OR=2.3, 95% CI: 1.5, 3.5) and iron deficiency (OR=2.2, 95% Cl; 1.4, 3.6) were independently associated with increased risk for anemia. The study also observed a seasonal variation in anemia not mediated through the other factors studied. In a cohort in rural Bangladesh, anemia at age 6 months was common and associated with infection, low birth weight and iron deficiency. Thus in low income setting where

neither screening for low birth weight nor for ID is feasible, additional strategies to iron supplementation appear to be needed. Delayed cord clamping can reduce risk of anemia in infancy and may be one way forward. However, considering the importance of LBW and infection for anemia, there is needed for greater attention to their prevention to control the observed high prevalence of anemia in infancy.

022 Halder AK; Gurley ES; Naheed A; Saha SK; Brooks WA; Arifeen SE; Sazzad HMS; Kenah E; Luby SP. Causes of early childhood deaths in urban Dhaka, Bangladesh. PLOS ONE/ www.plosone. Org. 2009 Dec; 4 (issue 12): 1-7.

The objectives of this analysis were to estimate the rates and causes of death among children under age 5 years in the catchments population of these hospitals in urban Dhaka, Bangladesh, and to compare the under 4 child mortality rates derived from two recall periods, one year preceding the interview versus the four years preceding the recent one year, Data on causes of early childhood death from low income urban areas are limited. The nationally representative Bangladesh Demographic and Health Survey 2007 estimates 65 children died per 1,000 live births. The study authors investigated rates and causes of under five deaths in an urban community year two large pediatric hospitals in Dhaka, Bangladesh and evaluate the impact of different recall periods. They conducted a survey in 2006 for 6971 households and a follow-up survey in 2007 among eligible remaining households or replacement households. The initial survey collected information for all children under five years old who died in the previous year, the follow up survey on child deaths in the preceding five years. They compared mortality rates based a 1 year recall to the 4 years preceding the most recent 1 year. The study results showed that the initial survey in 2006 identified 58 deaths (20 [34%] neonatal and 38 child) among children under age 5 years in the one year prior to the survey data, compared with 61 deaths (32 [53%] neonatal and 29 child) in the 2007 survey. The five year recall period prior to survey data during the follow up survey identified 267 under five deaths (means 53 deaths per year, SD±7.3) in which 56% were neonatal deaths. In the one year prior to the two surveys the neonatal mortality rate was 15.1 (95% CI: 11.5, 19.9) and under five mortality rate was 34.0 (95% CI: 284, 40.8) per 7000 live births. The leading cause of under-five death was respiratory infections (22%). The mortality rates among children under 4 years old for the two time periods (most recent 1 year recall and the 4 years proceeding the most recent 1 year) were similar (36 versus 32). The child mortality in urban Dhaka was substantially tower than the national rate. Mortality rate were not affected by recall periods between 1 and 54 years. From the analysis of the study results, it may be suggested that less than five child survival is better in this study community in urban Dhaka than in the country as a whole. However, the mortality is still high. Improving child survival in Bangladesh will require reducing serious child respiratory disease, redialing neonatal deaths and extending effective health services to both rural and urban areas.

023 Hale L; DaVanzo J; Razzaque A; Rahman M. Which factors explain the decline in infant and child mortality in Matlab, Bangladesh? *J Pop Research.* 2009; 26:3-20.

This paper investigated the roles of changes in key variables in the first two sets of factors in explaining the reduction in infant and child mortality in Matlab. The paper used data from the Matlab Demographic Surveillance System on nearly 94,000 singleton live births that occurred between 1987 and 2002 to investigate the extent to which the change in mortality over this period can be explained by changes in reproductive patterns and socio-economic characteristics. Here, it is estimated Cox proportional hazards models for four sub-periods of infancy and childhood. The review showed the results that changes over time in reproductive patterns (maternal age, parity

spacing) and in the socio-economic characteristics, it consider (e.g. maternal education, SES) explain between 10 and 40% of the decline in mortality rates. Changes in maternal educational explain the largest portion of the reduction in infant and child mortality over time that they are able to explain, followed by reductions in the incidence of short inter-pregnancy intervals. In the other direction, decreases in fertility over time led to increases in the proportion of births that were first births, putting upward pressure on mortality. The increase in the proportion of births that were first births would have made infant mortality rates higher in the later period than in the earlier period. As countries develop, women's educational levels increase while fertility falls. The former change leads to decreases in infant and child mortality, but the latter increases the proportion of all births that are first births, which have higher risks of infant mortality, and, during the first year of life, this offsets to some extent the beneficial effects of improvements in women's education. Future research should investigate the roles of other factors not considered here that are likely to be contributing to the decline in infant and child mortality rates, such as changes in environmental condition (e.g. sanitation, potable water), breast-feeing and improved quality of and access to health care.

024 Hanifi SMA; Haq MZ; Aziz RR; Bhuiya A. High concentration of childhood deaths in the low-lying areas of Chakaria HDSS, Bangladesh: findings from a spatial analysis. *Global Health Action*. Supplement 1, 2010; doi: P10.3402/gha. V30.5274: 70-76.

The goal of this paper is to see the spatial distribution of childhood deaths in an HDSS area located in the southern coastal area of Bangladesh. In a data analysis was done of 339 deaths among nearly 24,500 children under the age of five during 2005-2008. On ward the lowest of administrative unit, was the unit of spatial analysis. Data from 24 wards were analyzed. The discrete Poisson probability model was used to identify the clustering deaths. Deaths were concentrated with 12 wards located in the low lying deltaic flood plains of the Chakaria HDSS area. The risk of death in the low lying areas was statistically significantly higher 1.5 times than the non low-lying areas ($p<0.02$). The overall death rate was 13.9 per 1,000 person years of under-five children for the period between 2005 and 2008. Childhood mortality decreased steadily between those years. The death rate is statistically significantly higher ($p<0.0005$) in the low lying area than in non low-lying area (16.6 versus 11.3 per 1000 person years). The children of low-lying area have significantly poorer survival experience compared to the children of the non low lying area ($p<0.001$). It is also unknown causes of deaths for the babies who died within 2 days after birth showed a higher proportion of death cases in the low lying area compared to the non low lying area. Therefore to reduce mortality and morbidities, better health services are necessary. Better health services can be achieved when these services are monitored regularly. Spatial analysis can be also useful tool for identifying high risk mortality areas.

025 Hashizume M; Hagatsuma Y; Hayashi T; Saha SK; Strestfield PK ; Yunus M. The Effect of temperature on mortality in rural Bangladesh: a population based time series study. *International Journal of Epidemiology.* 2009; 38: 1689-1697.

This study was conducted to undertake time-series analyses to characterize the daily temperature-mortality relationships in rural Bangladesh. A generalized linear poison regression model was used to regress a time-services of daily mortality for all-cause and selected causes against temperature, controlling for seasonal and inter-annual variation, day of week and public holidays. A total of 13,270 all-cause deaths excluding external causes for residents under demographic surveillance in Matlab, Bangladesh were available between January 1994 and December 2002. The study findings revealed that there was a marked increase in all-cause depths and deaths due to

cardiovascular, respiratory and prenatal causes at low temperatures over a lag of 0-13 days. Every 1°C decrease in mean temperature was associated with a 3.2% (95% CI 0.9-5.5) increase in all-cause mortality. This s comparable with those observed in a study conducted urban cities of low-latitude countries including Delhi, Monterrey, Mexico City, Bangkok and Sao Paulo i.e. a 2.5-6.95 increase in all- cause mortality for every 1 C decrease in temperature below the threshold; and stronger than the cold effects observed in mid- to high-latitude cities like Sofia (0.7%) and London (1.4%). However, there was no clear heat effect on all-cause mortality for any of the lags examined. This study also found that daily mortality increased with low temperatures in the preceding weeks, while there was no association found between high temperatures and daily morality in rural Bangladesh. Preventive measures during low temperatures should be considered especially for young infants.

026 Hossain MZ. Factors associated with maternal prenatal care status in urban slums of Dhaka City, Bangladesh. *South Asian Journal of Population and Health.* 2009 July; 2(2):143-149.

The main goal of this study was to identify the factors which affect the maternal health during pregnancy of the city slums. In this paper an attempt was also made to focus on maternal health care during pregnancy in the urban slums of Dhaka city. The data used in this paper were collected by personal interview through the interview schedule of the slum dwellers in Dhaka city, using house to house visit with the head of households during the period spanned June 2003 to September 2003. Bivariate analysis as well as logistic regression analysis had been performed to determine the factors influencing maternal health care during pregnancy in some slum areas. From the analytical result it has been found that most of the slum women are illiterate and their food, treatment facilities, economic status etc. are below a certain standard. The role of education of respondents and their partners were found to be significant in receiving proper care during the period of pregnancy. Household status in terms of food and necessary consumption has significant contribution to receiving prenatal care during pregnancy of slum women for giving birth. The women who used family planning method faced fewer complications because of receiving proper care during pregnancy than the women who did not. Also it is observed that the Muslim slum women visit hospital or doctor for receiving prenatal care during pregnancy less than the women of other religions because of religious dogmas. However, maternity care in the slum area is essential, but women at high risk of complications with unexpected problems need more care than the health workers can provide. Modern health care services should be rendered for those mothers' sake.

027 Islam A. Our population program needs radical realignment. In: Monograph series; no. 11. Dhaka: BRAC University, James P. Grant School of Public Health, 2009.

This article was written to examine and review the population programs and what is to be needed for radical realignment. In this article, the author discussed that if the total fertility rate (TFR) 2.7 in 2006 does not decline further and soon Bangladesh, population is going to double by 2050 reaching a staggering 280 million. The author estimated those selves to be 71.3 million strong in 1974 as we emerged ours an independent nation. The first census conducted in independent Bangladesh (1981), put the figure at 89.9 million, however, the population growth rate declined somewhat to 2.35 percent during the decade following independence. It didn't further 2.17 percent during 1981-91 to 1.51 percent during 1991-2001. If the TFR does not come down to the replacement level by 2010, as was hoped for by our ever optimism population policy, we will continue to add more than 70 million people every five years. Even if we achieve a replacing level

fertility by 2015 or so as it is currently believed by most population experts are population will continue to increase till about 2025 before it starts on a declining mode. Over the years our target oriented population program distributed more condoms and pills than what the results show. Family planning workers also had targets how many condoms and pills to be distributed in a given month in a given village or upazila with little regard for the health of the target population women in reproductive age 15 to 49 years old. More importantly, as it remained exclusively focused on fertility control, the program failed to improve the critically important idea of health timing and spacing of pregnancy not to got pregnant before reaching the age of 18 and to keep a gap of at least two to three years between pregnancies healthy timing and sparing of pregnancy is essential to protect and promote the health of the pregnant women as well as that of the newborn, It is important that the higher the infant mortality rate, the higher would be the fertility rate. In short if we fail to ensure equality health care for the mother and newborn, we cannot expect women to restrict their pregnancy. If the IMR decline the TFR is also likely to go down further, In conclusion, our population program must be more holistic in better understanding and accommodating such inter connectedness of social, cultural, economic and demographic factors. It is also imperative that we make our population program an integral part of our overall integrated health and development effort.

028 Islam KM. Patriarchy and public policy: critical reflections on population policy in Bangladesh. *Dhaka University Journal of Development Studies*. 2010; 1(1):193-201.

The paper intents to examine and locate the presence of patriarchal perspectives, policy- measures and values which are embodied in public policies in a country like Bangladesh. The paper takes the case of population policy 2003 of Bangladesh in order to analyze various aspects of patriarchy in the process of governance. By using content analysis and qualitative interviews, the paper was examined that embedded institutions and power relation dominates the policy content despite significant powers from international actors. Despite the lack of sufficient resources Bangladesh has achieved significant health gains in recent years in terms of life expectancy; decline in fertility and infant and child mortality. However challenge still remains. Maternal mortality 194 per 100,000 (BMMS 2010) live births is still quite high. Bangladesh has highest rate of low birth weight and also remarks quite high in respect of malnutrition among children and women in the world. Anemia caused by in on deficiency among women and adolescent girls in one of the major health concerns. Here in this paper, women's reproductive health has been made limited to the contraceptive choice without ensuring the quality of contraceptives. Overall, the policy is a document of implicit and explicit resonance of the core values of the patriarchy. This essence of patriarchy is clearly visible in the text of the population policy 2003. The policy process again demonstrates that the traditional policy making always aim making in credential changes and not structural changes. Therefore, finally it would not be an overstatement if we say that the population policy 2003 is overwhelmed by the influence of prevailing patriarchal values and attitudes of the society in general.

029 Istiak KM. A Socioeconomic analysis of the maternal mortality in Bangladesh. *The Journal of Social Development.* 2008; 20(1): 105-122.

The Objective of this paper is to provide definition of maternal mortality; different economic, social and cultural factors affecting the maternal mortality in Bangladesh; Some policies to reduce maternal mortality in Bangladesh. This paper, in its study, follows the thesis, study report, working paper and published article of well-known academicians in this field. Maternal Health is a major public health problem in developing countries like Bangladesh. The most recent health

statistic relapsed in October 2007 jointly by UNFPA. WHO, UNICEF and the World Bank reveal that women continue to die of pregnancy-related cause at a rate of one minute? Maternal mortality ratio in 2007 of Bangladesh was 3.51 deaths per 1,000 live births at the national level. Maternal death is heartbreaking outcome of continuous reflect of women's health, their unequal access to economic freedom and other social advantages like life saving Emergency Obstetric Care (EOC) and their lack of division making power in families. To ensure adequate resources that promotes reproductive and child health and foster safe motherhood. To respect the rights of women to have access to education, health care and to take critical decisions affecting their lives. To formulate a make report accurately on maternal mortality and neonatal morbidity and progress of various programs. Women and husbands, partners, neighbors, college vest and leader need to become more actively involved in supporting women in making choices and taking actions to improve their health and well being.

030 Kabir A; Kabir M. Does community factor matter to influence infant and child mortality in rural Bangladesh? *Journal of Statistical Studies*, 2010; 29: 47-56.

The main objective of this paper is to investigate the influence of community characteristics on infant and child mortality in rural Bangladesh. The specific objective of the paper as to assess the interaction among community, individual and demographic characteristics. The present study used data dried from the BDHS 2004. The 2004 BDHS samples a stratified multistage cluster sample consisting of 361 PSUs (primary sampling units). Among the clusters 239 were in the rural area. A systematic sample of 10,811 households was then selected. All over married women in the selected households were interviewed to collect birth and death history data. To identify the effects between individual and community characteristic were also estimated. It is to be mention here that third is not straight forward relation between community characteristics and infant child mortality community infrastructural development is operational zed as close proximity to hospital family welfare center pharmacy, distance to MBBS doctor, District to Upazila and community mothers who are the members of Grameen Bank. The infant and child mortality rates with community characteristics are shows in expected patterns. The mother of the child with longer birth internal with three years and more and these who have access towers media have lower infant and child mortality rates, Bivariate analysis showed that the individual and community variables is significantly associated with infant and child mortality. The log linear model and the estimated exponentiation parameters show that the common type of transportation and distance to MBBS doctors are found to be significantly associated in infant and child mortality. For instance community education level may affect child mortality by influencing norms and attitudes regarding child care and reproductive behavior. At the community level mass media such as TV also plays a significant role in disseminating the various child health and reproductive health care matters. The analysis supports that the closer is the health facilities and accessibility of the professional doctors the higher is the likelihood that community members take their child to there in the doctors of serious sickness.

031 Koblinsky M; Anwar I; Maridha MK; Chowdhury ME; Botlero R. Reducing maternal mortality and improving maternal health: Bangladesh and MDG 5. *J Health Popul Nutr.* 2008 Sep; 26(3): 280-294.

The study was conducted to examine the reducing of maternal mortality and how would improve the maternal health and how to achieve Bangladesh the MDG 5 targets. Bangladesh had signed for achieving the Millennium Development Goals (MDGs) by 2015. Bangladesh is on its way to achieving the MDG 5 targets of reducing the maternal mortality ratio by three quarters between

1990 and 2015. But the annual rate of decline needs to triple although the use of skilled birth attendants has improved over the past 15 years. It remains less than 20% as of 2007 and is especially low among poor, uneducated rural women. Increasing the numbers of skilled birth attendants, deploying them in teams in facilities, and improving access to them through messages antennal care to women, have the potential to increase such use. The use of caesarean section is increasing although not among poor, uneducated rural women. Strengthening appropriate quality emergency obstetric care in rural areas remains the major challenge. Strengthening other supportive services, including family planning and delayed first birth, menstrual regulation and education of women are also important for achieving MDG 5. The way forward to achieve MDG 5 in Bangladesh depends on improvements in the health systems. This is not just a technical debate; it will require the buy-in from top political stakeholders to improve facilities and staff and supply them adequately. Moving to this level of debate is the next step in achieving MDG 5.

032 Mabud MA. Health sector reform in Bangladesh: achievements and challenges. In: Health sector reform: lessons from developing countries/ed by Ubaidur Rob and Md. Noorunnabi Talukder. Dhaka: Utsho Prokashan, 2007.

The study was undertaken to assess the rate of health sector in Bangladesh and role of Government and NGOS. The health sector of Bangladesh has demonstrated a remarkable success, measured in terms of reduction of mortality rates, increasing life expectancy at birth, the spread of family planning activities, and substantial reduction in fertility rate since 1980s despite its low socio-economic environment. Bangladesh's population was estimated to be 138 million in 2004 and growing at the rate of 1.5 percent annually. About 48 percent of the population was below 15 years of age. Infant and maternal mortality rates were reportedly 65 and 3.2 per 1000 live births respectively. Life expectancy at birth was 61 years in 2004. The population density was estimated 870 persons per square kilometer. There are two large units in the Ministry of Health and Family Welfare (MOHFW) of Bangladesh – the Directorate General Family Planning and the Directorate General Health Services. Health and family planning and the services had traditionally been separate vertical programs under the MOHFW, but operated together at the field level under separate management and control. Besides the government's efforts, around 300 NGOs are working in the health sector. Some of them are playing pro-active roles in the promotion of health and population activities. These NGOs are implementing innovative programs such as community health care project, maternal and child health-family planning service delivery programs, doorstep service through female service provider, installation of water-sealed latrine, health insurance scheme and cost recovery scheme. The role of NGOs in the health and population sectors has been constantly expanding. A large number of NGOs have been working in the health sector, but the most prominent three NGOs are namely, Grameen Kalyan, BRAC and Gonoshasthya Kendra which have been playing a most pro-active role for the promotion of health and population activities. These organizations have initiated many innovative projects and provided required information to policy formulation. The foregoing discussions suggested that reforms undertaken in the health sector prior to 1990 in Bangladesh were intended to ensure equity in access to the health services. Most of the health and family planning infrastructures in the areas of service delivery and family planning infrastructures in the areas of service delivery and human resources development were established during this period. The review shows that introduction of malaria eradication program, community focused MCH-based family planning program, and EPI prior to 1990 have demonstrated considerable output in terms of reduction of mortality and fertility. Health sector investment has also increased almost five folds since 1975, showing positive results in terms of increasing life expectancy at birth. The main policy strategies pursued during this period were: doorstep services.

033 Mostafa MG; Rahman MM; Alom MJ. Adolescent fertility behavior in Bangladesh. *South Asian Journal of Population and Health*. 2008 July; 1(2): 171-183.

The present study was initiated to investigate the various issues of adolescent's fertility in Bangladesh. It was conducted by using Bangladesh Demographic and Health Survey (BDHS) 2004 data. In this study, the target population is married adolescents of age range 10-19 years. The analysis revealed that the mean number of children ever born to the adolescent mothers is 0.67 and the average number of living children is 0.61. It also indicated that childbearing begins early in Bangladesh with a mean age at first birth for adolescent mothers of 15.65 years. Age at marriage, education, membership of NGOs appear as the most important factor determining the mean number of children ever born among adolescents. It was also indicated from the study that 2 children would be preferable among adolescents (72.0%) as the ideal number of children in their family. The study showed that 49.8 percent adolescents' wives do not discuss with their husband the number of children they desired. Children, ever born, place of residence, respondents' education and current age appeared as the significant factors for discussing with husband the number of children they desired. The study findings recommended that it should create awareness about the reproductive right of choosing the number of children in their family and right to discuss with their husband desiring children among the women.

034 Naher L; Akhter S. Impact of village theatre on unsafe abortion and postpartum hemorrhage related to maternal death in rural Bangladesh. Dhaka: NIPORT & BIRPERHT, 2010.

The study was initiated to have a better understanding of existing level of knowledge and practice of general people especially in rural settings about postpartum hemorrhage, unsafe abortions and its consequences. This operations research adopted a non-experimental baseline survey, intervention (village theater) and post intervention survey design and non-equivalent control group survey which was conducted through village theatre on around 3 months intervention upon unsafe abortion & its consequences and PPH & its consequences. A total of 1330 samples were interviewed as study intervention and control group in the baseline and post evaluation data collection phase. A total of 703 mothers (337 in control & 366 in intervention area) and 627 husband & mother-in-law (306 in controls & 321 in intervention area) were interviewed through structured questionnaire by trained interviewer. The study findings indicated that statistically significant shift have been achieved through the intervention program especially in intervention area on most of the issue related to MR, Safe abortion and PPH. After intervention no such statistically significant change was observed in control area before and after intervention but in intervention area it is almost double. After intervention among the mother-in-laws and husband in the control area no apparent shift in response regarding complication of unsafe abortion was evident. The pattern of response was almost similar before and after the intervention. In the intervention area correct response like menstrual regulation (41% to 47%), abortion (46% to 49%) was apparent ($P<.05$). By perception about post partum hemorrhage the study showed that before intervention almost sixty five percent mother of both control and intervention area knew as bleeding after delivery. Bleeding with 24 hours of delivery mention by 12-16%, but one fourth in control and one fifth in intervention area mentioned bleeding within 42 days of delivery. No such difference is observed between the areas. Increased awareness through publicly was found more among the husband and mother-in-laws. Interestingly the number of respondents who were completely unaware about the preventive measure was reduced after intervention in intervention area. On the basis of the findings it should be made awareness campaign and BCC to dispel misunderstanding and negative attitude about safe abortion, MR, postpartum hemorrhage by using

print media and electronic media for reaching the millennium development goal (MDG 5) concerning the reduction of maternal mortality. Facilities related to safe abortion should be made available to the clients and it should have to be created environment for women and couple to access to safe abortion services and stronger social service mechanism.

035 Naved RT; Chowdhury S; Arman S; Sethuraman. Mobility of unmarried adolescent girls in rural Bangladesh. *Economic and Political Weekly*. 2007 Nov.3; 63-70.

The objective of this analysis was to examine patterns of mobility and restriction among unmarried adolescent girls. The methodology used for this study, was to design as a part of the larger three-site study and a common protocol was developed collaboratively by the research partners. The analysis presented here centers on data collected on unmarried adolescent girls in two regions of rural Bangladesh: Matlab and Mirzapur. The analysis was based on data from in-depth interviews with 20 unmarried adolescent girls and form FGDs with such girls and eight with parents of such girls. Checklists and guiders for the interviews and FGDs were developed collaboratively with research partners. The survey results indicated that two third of the 20 unmarried adolescent girls interviewed were 14-15 years old. All girls had reached menarche. The majority had at least a primary education; however, two girls had none, while one was attending college. Eleven girls had dropped out of school. Most of the girls came from nuclear families. Form families had only two children, but the majority had more. The interviewed sample in the two regions differed in certain aspects. Relative to their counterparts in Mirzapur, the girls in Matlab generally were older more educated and more of ten from non poor families. Because socioeconomic states differed considerable between the sites, data were pooled and analyzed by socioeconomic status rather them by site. Most adolescent girls, whether from poor or non-poor families, reported that their mobility was far more restricted after monarch. However, this level of mobility varied five girls had low mobility. Three had high mobility and 12 had medium mobility. The parents seen here are consistent with findings from larger quantitative surveys in many aspects. This finding is important in several respects. They suggest that although gender discrimination and restrictions are widely prevalent, at the community level, there are opportunities for change because not all families adhere strictly to the rules of social expectations. Moreover in some cases, girls are skilled at challenging existing social practices and at negotiating for more freedom. These insights may help inform efforts to encourage parents to allow their daughters to continue their education, delay their marriage and develop life skills critical for their well being in the future.

036 Rahman A; Vahter M; Ekstrom EC; Rahman M; Mustafa AHMG; Wahed MA; Yunus M; Persson LA. Association of arsenic exposure during pregnancy with fetal loss and infant death: a cohort study in Bangladesh. *American Journal of Epidemiology*. 2007; 165(12): 1389-1396.

The aim of this study was to assess the effect of individual arsenic exposure through drinking water on fetal and infant survival. The authors evaluated the effect of arsenic exposure on fetal and infant survival in a cohorts of 29, 134 pregnancies identified by the health and demographic surveillance system in Matlab, Bangladesh, in 1991-2000. Arsenic exposure, reflected by drinking water history and analysis of arsenic concentrations in tube well water used by women during pregnancy was assessed in a separate survey conducted in 2002-2003. Data on vital events, including pregnancy outcome and infant mortality, were colleted by monthly surveillance at the household level. The risk of fetal loss and infant death in relation to arsenic exposure was estimated by a Cox proportional hazard model. The study results showed that the mean age at

pregnancy was 27 years and about half of the pregnancy cohort consisted of list sate women. Twenty-six percent of the pregnant women were prim gravid. No women in the study are smoked on used alcohol. The 29,134 pregnancies resulted in 2,444 fetal losses, 1,096 induced abortions, 850 neonatal deaths, and 523 post neonatal deaths. Drinking tube-well water with more than 50 μg of arsenic per liter during pregnancy significantly increased the risks of fetal loss. There was a significant dose response of arsenic exposure to risk of infant death (p=0.02). Therefore there is an urgent need to strengthen arsenic mitigation programs and to prioritize women in reproductive age in that process.

037 Rahman F. An investigation into early marriage in Bangladesh. *Dhaka University Journal of Development Studies.* 2010; (1):155-16.

The broad objective of this study is to identify the causes and effect of early marriage on the lives of girls. The specific objectives of the study are; (a) to delineate the levels and patterns of the early marriage and, (b) to identify the determinant of early marriage. A rural and an urban areas were selected for the study for rural study area village Mirjapur of Raipara thana in Narsingdi district was purposively selected and for urban study area Rampura of Dhaka city was selected. A structured interview schedule was prepared to collect the required information (data). Data was collected through face to face interviews. The study revealed that the mean age at marriage for girls is 15-69 years as a whole and it is lower (15-21 years) in rural area than that of urban area (17-13 yrs). These readings confirm that early marriage still exists. In relation to patterns most of the marriages amongst the study population is found to be 'arranged' (87.8%) and by the guardians/parents (89.5%). Among the study population, about 99% are currently married, 2 respondents (one in urban and one in rural area) are found widowed while 2 respondents of urban area are divorced and one in rural are is separated. The majority (97%) of the respondents are involved in household work and there works do not regard as income generating activities in the family. The percentage of this category is 97.3 and 85.0 respectively for the rural and urban area. It was found that age at first marriage of the respondent is 27.3% in the rural and 18% of the husband in urban area. Regarding the education of the respondent's husband, 40% have education in 6-8 years of schooling in rural area whereas in urban area, the majority (34%) has 10-12 years of education. It is found that in most cases the marriages are arranged (87.8%) by the parents/guardian. Amongst the rest 11% falls in love before marriage category. In dowry issue, the study indicates that more than two–third (70%) of the marriage took place with dowry and about 30% without dowry. It is observed that socio-economic demographic and programmatic variables are the determinants of the dependent variable (early marriage/age at marriage). So, from these identified variables, an idea can be made about the level and pattern of marriage in both rural and urban areas.

038 Razzaque A; Streatfield PK; Gwatkin DR. Does health intervention improve socioeconomic inequalities of neonatal, infant and child mortality?: evidence from Matlab, Bangladesh. *International Journal for Equity in Health*. 2007; 6:4 (doi: 10,1168/1475-9276) 6-4) 1-14.

The present study was examined the issue further by adding two more birth cohorts with longer observation period along with more breakdown of age. The study also emphasized whether health intervention programs reduced socioeconomic inequalities of neonatal, infant and child mortality and whether the inequalities home changed overtime, As study methods, four birth cohorts (1983-85, 1988-90, 1993-95, 1998-00) were followed five years for death and out migration in two adjacent areas (ICDDR,B service and government service) with similar socioeconomic but differ

health services. Based on asset quintile, inequality was measured through both or rich ration and concentration index. The study fount that the socioeconomic inequalities of neonatal, infant and under five mortality increased over time in both the ICDDR,D service and government services areas but it declined substantially for 1-4 years in the ICDDR,B service area. The study contended that usual health intervention programs (non targeted) don not reduce poor rich gap, rather the gap increases initially but might decrease in long run if the programs is very intensive. The study results indicated that mortality is declining in both the areas and there is evidence that the socioeconomic inequality might decline in future as documented in the ICDDR,B services area for child mortality. But health intervention in the ICDDR,B service area in so intensive that it might not be possible to replicate it at the national level, however, can guide the policy planner in formulating appropriate health policy.

039 Ronsmans C; Chowdhury ME; Koblinsky M; Ahmed A. Care seeking at time of childbirth, and maternal and perinatal mortality in Matlab, Bangladesh. *Bull World Health Organ.* 2010; 88: 289-296.

The study aim was to examine the nature of the relationship between the use of skilled attendance around the time of delivery and maternal and prenatal mortality. The study analyzed the health and demographic surveillance system data, collected between 1987 and 2005 by the International Center for Diarrhea Disease Research, Bangladesh (ICDDR, B) in Matlab, Bangladesh. According to study results, it was recorded 59,165 pregnancies, 173 maternal deaths, 1,661 stillbirths and 1,418 early neonatal deaths in its service area over the study period. During that time, the use of skilled attendance during childbirth increased from 5.2% to 52.6% More than half (57.8%) of the women who died and one-third (33.7%) of those who experienced a prenatal death (i.e. a stillbirth or early neonatal death) had sought skilled attendance. Maternal mortality was low among women who did not seek skilled care (160 per 100,000 pregnancies) and was nearly 32 items higher (adjusted odds ratio, OR: 31, 66: 95% confidence interval, CI: 22.03-45.48) among women who came into contact with comprehensive emergency obstetric care. Over time, the strength of the association between skilled obstetric care and maternal mortality declined as more women sought such care. Prenatal death rates were also higher for those who sought skilled care than for those who did not, although the strength of association was much weaker. It also sought that the high maternal mortality ratio and prenatal mortality rate among women who sought obstetric care. Therefore, more work should be needed to ensure that women and their neonates receive timely and effective obstetric care. Reductions in prenatal mortality will be required strategies such as early detection and management of health problems during pregnancy.

040 Ronsmans C; Chowdhury ME; Dasgupta SK; Ahmed A; Kablinsky M. Effect of parent's death on child survival in rural Bangladesh: a cohort study. *Lancet.* 2010; 375: 2024-2031.

The study investigated the effect of the death of the mother or father on the survival and rates of age-specific death up to age 10 years in rural Bangladesh. The study used the data from population surveillance during 1982-2005 in Matlab, Bangladesh. Here, it is used Kaplan Meler and Poisson regression analysis to compute the cumulative probabilities of survival and rates of age-specific death up to age 10 years, according to the survival status of the mother or father during that period. The study findings showed that there were 144861 live births, and 14868 children died by 10 years of age. The cumulative probability of survival to age 10 years was 24% in children whose mothers died (n=1385) before their tenth birthday, compared with 89% in those whose remained alive (n=143473). The greatest effect was noted in children aged 2-5 months

whose mothers had died (rate ratio 25.05, 95% CI 18.57-33.81). The effect of the father's death (n=2691) on cumulative probability of survival of the child up to 10 years of age was negligible. Age-specific death rates did not differ in children whose fathers did compare with children whose fathers were alive. The devastating effects of the mother's death on the survival of the child were most probably due to the abrupt cessation of breastfeeding, but the persistence of the effects up to 10 years of age suggest that the absence of maternal care might be a crucial factor. The death of a mother not only affects the survival of her child in the immediate maternal period, as embodies in the Millennium Development Goal 5, but also throughout the life cycle of the child and into the next generation. The future for children will not be safe without sustained investments to ensure that a mother is healthy throughout the life of her child.

041 Ronsmans C; Chowdhury ME; Alam N; Koblinsky M; Arifeen SE. Trends in stillbirths, early and late neonatal mortality in rural Bangladesh: the role of public health interventions. *Pediatric and Perinatal Epidemiology*. 2008; 22: 269-279.

The study was undertaken to examine in a cohort study of stillbirths and early and late neonatal deaths in Matlab, a rural area of Bangladesh between 1975 and 2002, using routinely collected demographic surveillance data. Main outcome measures were stillbirths per 1000 births, early neonatal deaths per 1000 live births, and late neonatal deaths per 1000 children surviving after 1 week. It performed a logistic regression examining trends over time and between two areas in the three outcome measures, controlling for the effects of parental education, religion, time, geography, parity, maternal age and birth spacing. The findings showed that there was a marked decline in stillbirths, early and late neonatal mortality over time in both areas, though the pace of decline was somewhat faster in the ICDDR, B (International Centre for Diarrhoeal Disease Research, Bangladesh) service area. Stillbirths declined by 24% overall in the ICDDR, B service area (crude OR comparing 1996—2002 with 1975—81:0.76 [CI 0.68, 0.84]), compared with 15% in the Government service area (crude OR comparing 1996—2002 with 1975—81: 0.85 [0.76, 0.94]). The overall seduction in early and late neonatal mortality comparing the same periods was 39% and '73%, respectively, in the ICDDR,B area, compared with 30% and 63%, respectively, in it Government service area. Adjusting for socio-economic or demographic factors did not substantially alter the time or area differentials. The dramatic decline in neonatal mortality was, in large part, due to a fall in deaths from neonatal tetanus. The pace of line was faster in the area receiving intense maternal and child health and family planning interventions, but stillbirths, early and late neonatal deaths also declined in the area not receiving such intense attention, suggesting that factors outside the formal health sector play an important role.

042 Sharmin S; Mahbub A; Bari W. Impact of early marriage and early motherhood on fertility and their correlates: a study on BDHS 2004. *South Asian Journal of Population and Health.* 2009 July; 2(2):131-141.

This paper attempts to examine the contribution of these two proximate determinants on the level of fertility in Bangladesh based on the data from BDHS 2004. The selected determinants are further analyzed in relation to women's and their husbands' socio-demographic characteristics. It is found that an increase in the female age at marriage and age at motherhood can significantly reduce the level of fertility. Most of the variables considered showed statistically significant association with both age at marriage and age at motherhood. However, education of the respondents showed the most pronounced association. Among other variables studied, husbands' education, both respondents' and husbands' occupation and exposure to television also showed significant association with both the proximate determinants. Also increased participation of women in paid workforce should be encouraged. Above all, the government should take all

necessary steps so that the law regarding legal age at marriage for both male and female is implemented in right calmest in all corners of the country.

043 Streatfield PK; Karar ZA. Population challenges for Bangladesh in the coming decades. *J Health Popul Nutr*. 2008 Sep; 26(3): 261-272.

This review article was written to examine the population challenges of Bangladesh in the coming decades and what the existing situation that may what measures may be taker to overcome the barriers to reach the MDG goals. Bangladesh currently has a population approaching 150 million and will add another 100 million before stabilizing, unless fertility can soon drop below replacement level. This level of fertility deckling will require a change in marriage patterns, which have been minimal so far, even with increasing female schooling. It would also benefit from a long-awaited shift to long term contraception. In addition to the consequence of huge population size, the density of population is already five times that of any other "Mega" country (>100 million), a very challenging situation for an agricultural society. Most of the future growth will be urban, increasingly in slums. Numbers of young people will not increase, but numbers of older people will increase 10-fold this century, creating a large burden on the health system, especially for chronic illnesses. High density of population means that agricultural land is virtually saturated, with very limited capacity to expand food production. Climate change may have dramatic impacts on agriculture, through flooding and drought resulting from weather changes and geopolitical influences on Transporter Rivers. Rising sea-levels and consequent salinity will affect crops and required shifts to alternative land use. Serious long term planning is needed for meeting the growing needs of the population, both for distribution and consumption.

044 Vanzo JD; Hale L; Razzaque A; Rahman M. The effects of pregnancy spacing on infant and child mortality in Matlab, Bangladesh: how they vary by the type of pregnancy outcome that began the interval. *Population Studies*. 2008:62(2): 131-154.

The study was undertaker to investigate the effect on mortality of the inter-outcome intervals by the type of outcomes that began the interval and to assess how the effects of intervals of various lengths vary with the age of the child; the extent to which the effect of longer inter-birth intervals is a consequence of a non-live births (NLB) between the two births. The study was conducted by using high quality longitudinal data on 125,720 singleton live births in Matlab, Bangladesh. The study also assessed the effects of duration of intervals between pregnancy out comes on infant and child mortality and how these effects vary over sub-periods of infancy and childhood and by the type of outcome that began the interval. Controlling for other correlates of infant and child mortality, it found that shorter intervals are associated with higher mortality. Interval effects are greater if the interval began with a live birth than with another pregnancy outcome. In the first week of the child's life the effects of short intervals are greater if the sibling born at the beginning of the interval died; after the first month, the effects are greater if that sibling was still alive. Many relationships found are consistent with the maternal depletion hypothesis, and some with sibling competition. Some appear to be due to correlated risks among births to the same mother. So, future research should try to explain the role that breastfeeding (and its intensity) plays in the relationship between birth spacing and infant and child mortality. Inter-birth intervals also may be associated with confounding socio-economic factors associated with both short intervals a high infant and child mortality.

045 Yusuf HR; Akhter HH; Chowdhury ME; Rochat RW. Causes of death among women aged 10-15 years in Bangladesh, 1996-1997. *J Health Popul Nutr*. 2007 Sep; 25(3): 302-311.

The study was carried out to assess and identify the causes of death among female adolescents and women aged 10-15 years in Bangladesh. During 1996-1997, health-service functionaries in facilities providing obstetric and maternal and child-health services were interviewed on their knowledge of deaths of women aged 10-15 years in the past 12 months. In addition, case reports were abstracted from medical records in facilities with in-patient services. The study cov ered 4,751 health facilities in Bangladesh. Of 28,998 deaths reported, 13,502 (46.6%) occurred due to medical causes, 8,562 (29.5%) due to pregnancy-related causes, 6,168 (21.3%) due to injuries, and 425 (1.5%) and 259 (0.9%) due to injuries and medical causes during pregnancy respectively. Cardiac problems (11.7%), infectious diseases (11.3%), and system disorders (9.1%) were the major medical causes of deaths. Pregnancy-associated causes included direct maternal deaths (20.1%), abortion (5.1%), and indirect maternal deaths (4.3%). The highest proportion of deaths among women aged 10-19 years was due to injuries (39.3%) with suicides accounting for 21.7%. The largest proportion of direct obstetric deaths occurred among women aged 20-29 years (30.5%). At least one quarter (24.3%) of women (n=28,998) did not receive any treatment prior to death, and 47.8% received treatment either from a registered physician or in a facility. More focus is needed on all causes of deaths among women of reproductive age in Bangladesh.

046 Zaman K; Breiman RF; Yunus M; Arifeen SE; Mahmud A; Chowdhury HR; Luby SP. Intussusceptions surveillance in a rural demographic surveillance area in Bangladesh. *The Journal of Infectious Diseases.* 2009; 200: S271-6.

This study was undertaken to estimate the background incidence rates of intussusceptions among children aged <2 years, using retrospective and prospective studies in a rural demographic surveillance area in Bangladesh. All hospital charts of children aged <2 years who presented to the Matlab Hospital and 2 other treatment centers of the ICDDR,B, during January 2001 - August 2004 were reviewed retrospectively. A prospective surveillance was performed from August 2004 through December 2006 at the 3 treatment centers of ICDDR, B serving Matlab, 4 district and sub district government hospitals, and 3 district-based private clinics, to determine population-based rates of intussusceptions with use of Brighton Collaboration case definitions. All suspected cases of intussusceptions were referred to the Matlab Hospital by community health research workers for further assessment by a trained medical officer, including performance of an ultrasound examination. The study results found in total 2856 charts of children aged <2 years were reviewed retrospectively, and 4 probable cases and 19 possible cases of intussusceptions were identified. In the prospective surveillance, of 1508 potential cases, including 41 referred by community health research workers, only 2 cases met the case definition of probable intussusceptions, and 1 case met the definition of possible intussusceptions. A total of 123 patients had ultrasound examinations performed. The population-based rates of probable and possible cases of intussusceptions among children aged <2 years were 0-17.8 and 17.7-81.7 cases per 100,000 children per year, respectively. In the retrospective and prospective surveillance, the rates were 0-18.7 and 0-97 cases per 100,000 children per year, respectively. The incidence of intussusceptions was low among children in Bangladesh. A surveillance system for intussusceptions has been fully established in the Matlab surveillance area to diagnose, treat, and refer potential cases. This study provides useful information for detection of intussusceptions during future studies of new-generation rotavirus vaccines and also provides background incidence rates for comparison when rotavirus vaccines are introduced.

2.2 FAMILY PLANNING (contraception, methods, side effects, follow-up, etc.)

047 Al-Sabir A. Determinants of contraceptive use across regions in Bangladesh. Dhaka: NIPORT & Population Council, 2008.

The objectives of this study were to examine the variation in use of contraceptive methods from a geographical region level perspective, to identify the important factors responsible for regional variation and to recommend appropriate ways to minimize deviation in the regional use of contraceptive methods. The 2004 BDHS data set has been used in the analysis. In analyzing the data, appropriate statistical methods, including logistic regression, have been employed. The result of the study indicated that Sylhet and Chittagong regions are characterized by low contraceptive use. This low use of contraceptive methods is likely to be associated with the two divisions, higher demand for children and health and family planning program weakness. The lower fieldworker visitation in Sylhet and Chittagong is a clear indication of program weakness in these regions. Exploratory analysis also indicates that majority of the districts in Sylhet and Chitagong divisions are characterized by lower than average levels of contraceptive use. The logistic regression results showed that a substantial regional variation of contraceptive use remains even after controlling the effect of various types of variables. There is no sufficient explanation why such a variation exists. However, some programmatic actions can be speculated. Supply, defined as fieldworker visitation, is extremely significant in the sense that women who do not receive visits from the fieldworker are much less likely to use contraception. Moreover realizing the fact that the programmatic weakness in low performing regions should be minimized or removed in order to increase the use of contraceptives, the focus should also be on how to strengthen the program. Accordingly, it can be hypothesized that the increased demand for services will encourage the health and family planning programs to improve the accessibility and quality of services. Therefore it remains a challenge for the Bangladesh Health, Nutrition and Population Sector Program to increase utilization of services, in general and in the low performing regions in particular. The demand for services can be increased by making people more aware of the need for services, along with ensuring the availability of quality services. The program should also remain ready to deliver services asked for, by improving quality of services and efficiency of the program.

048 Anonymous. Assess factors related to acceptance or non-acceptance of permanent or long-term family planning methods. Dhaka: NIPORT & GUS, 2010.

The main objective of the study was to assess factors related to acceptance or non-acceptance of permanent or long-term family planning methods in Bangladesh. The study followed a cross sectional statistical design, an integrated approach combine with both qualitative and quantitative methods were adopted to conduct the study. Interview and focus group discussions were initiated to obtain study information. In addition, available secondary data were analyzed for the purposes. For statistical representation multi-stage sampling procedure was considered in deciding sample size. Information was directly obtained from the community. The study found that a large majority (97.9%) of long term method users have heard about family planning methods from the field workers, Service centers (2.8%), husband (1.4%). Neighbors (1.4%) were other reported sources from were permanent method users heard about family planning methods. Permanent method users were satisfied with the services of the service providers because they maintained the privacy of the clients, sterilized the instruments and have taken all the necessary steps to provide them the method. The study further indicated that 1.4 percent was affected by side affect or

complication after receiving the method. However, they got proper treatment for side effect or complication. It also found that a large majority of the non-users were motivated by FWA to accept permanent or long term method but they did not go for any family planning method as they have heard about the side affect/disadvantages of family planning method. More than half of the service providers believed that the numbers of the long term method users are being comparatively decreasing day by day. A large number (83.3%) of the service providers believed that publicity in print and electronic media focusing the advantages of long term method/permanent methods might be useful to grow interest among the probable long term method users. It is recommended that proper training (both theoretical and practical) program should be arranged for the service providers and field workers to increase their knowledge and skill to provide such services. Steps should be taken to increase the amount given for incentives.

049 Anonymous. Role of men in health care participation in rural Bangladesh. Dhaka: NIPORT & ACPR, 2010.

The study was conducted to explore the role of men in health care participation in rural Bangladesh. The study used a cross sectional design. An integrated approach combine with both qualitative and quantitative methods were adopted to conduct the study. Interview and focus group discussions were initiated to obtain study information. In addition, available secondary data were analyzed for the purposes. For statistical representation multi-stage sampling procedure was considered in deciding sample size. Information was directly obtained from the community. Interview and focus group discussions were initiated to obtain study information. Survey instruments mainly includes format for updating household lists and survey questionnaire. Respondent questionnaire used for interviewing married men age 15-54. The findings revealed that men need more information about family planning, contraceptive methods, and reproductive physiology. The study found that among husbands who were not using a contraceptive method themselves, about 90% knew that they could help their wives avoid pregnancy by abstaining from sexual relations or by allowing their wives to use contraception. Only few, however, could identify the time in a women's cycle when she is fertile and only half could identify a symptom of pregnancy complications. From the focus group studies in rural areas found that married men's knowledge was limited to the IUD, Pill, and condom. They expressed about the health effects of the pill and the IUD and said they needed more information about safety and about other contraceptive choices. Majority of the men had no discussion on family planning. Only 8% of men discussed family planning with their wife and very few discussed family planning with workers or neighbors. It seems men are not playing their role in making family planning popular in the community. Most of the women are using FP methods like oral pill, female sterilization, IUD, injectables and implants. Few males are using male methods like condom and male sterilization. It seems male participation in use of contraception is low. Use of condom is important in reducing STDs. Only 3.3% are using condom for preventing birth. A very few only 2% are using it for avoiding STDs. Most women with unmet need probably have a number of reasons for not using contraception's. Majority of men are in favor of having antenatal care of his wife during pregnancy even she is sick. More one-fourth of the husband was presence in the house of hospital during their delivery. Receiving postnatal care for women and children is also very low. The study finally recommended the following six important issues for effective male participation. These issues are: i) use of the mass-media to communicate with men; ii) reach out to young and unmarried men; iii) encourage couple communication; iv) bring information to where men gather; v) offer information and services that men want; and vi) counsel men with respect and sensitivity.

050 Anonymous. Future of family planning program in Bangladesh: issues and challenges- workshop report. Dhaka: Population Council, 2010.

The goal of the workshop was to identify issues and develop action-oriented future strategies for improving the national family planning program, which would cater the future needs of the population. The workshop was organized by the Population Council 0n 16 October 2010 in Dhaka. It was a half- day long workshop and divided into two sessions: keynote paper presentation, thematic discussion session. The workshop was an apex-level event which brought together key policymakers, program managers, researchers and academicians involved in, and relevant to, the issue of national family planning program. A total of 69 participants attended the workshop. The total fertility rate (TFR) declined rapidly until mid-nineties in Bangladesh. Over the last decade, the country has been experiencing slow pace in fertility decline with a small increase in contraceptive prevalence rate. During 1975 to 1994, TFR decreased significantly from 6.3 to 3.3followed by a period of negligible decline of only 0.6 from 1994 to date. This slow pace in fertility decline is causing serious concern in reaching replacement level fertility by 2015. Several factors slowed the fertility decline in Bangladesh like early age at marriage, reliance on temporary methods of contraception, decline in the use of long-acting and permanent methods, discontinuation in the use of contraceptives, unmet need for family planning and regional variation in fertility. Some recommendations prioritized at the workshop are given below. Higher demand for children and less accessibility to quality family planning services are accounted for low performance of family planning program in Sylhet and Chittagong divisions. It is necessary to undertake special program in these two low-performing divisions. There is a great problem regarding vacancy of human resources. Under DGFP, about 40 percent post of doctors is vacant. The last recruitment of Family Welfare Visitors (FWVs) was in 1996. Filling up the vacant posts of service providers and reviving the training program for FWVs is an important area of immediate attention. Government's initiative to introduce vital registration system could be effective to prevent early marriage of girls. Implementation of this recommendation will require huge investment in the population sector. It is important to note that only 3% of the gross domestic product (GDP) is devoted to the health sector from which less than 20% goes to the population sector. Along with the increased funding it is also necessary to ensure program efficiency through optimum use of facilities infrastructure and personnel.

051 Anonymous. Study on unmet need for family planning in Bangladesh. Dhaka: FPAB, 2010.

This study was undertaken to assess the unmet need for family planning in Bangladesh and to explore significant determinants of unmet need for family planning. The study estimates unmet need for family planning used both conventional and unconventional definitions. Limiting and spacing needs are considered as conventional while poor contraception and health-risk needs are considered as unconventional. The study used data of BDHS 2004. The survey followed a two-stage sample design based on the 2001 census. The analysis was done through multinomial logistic regression model. The finding revealed that the services for method choice for fertility regulation and ensuring safe pregnancy and delivery are also emphasized. Like most of other countries, the conventional estimates of unmet need are available in all Demographic and Health Surveys (BDHS) conducted in Bangladesh. Individual fertility preference and contraceptive use are two basic considerations of these estimates. During last decade, contraceptive prevalence has increased 13 percentage points (from 45 percent in 1993-94 to 49 percent in 1996-97 and 54 percent in 1999-2000 to 58 percent in 2004), whereas the proportion of currently married women who wish to regulate childbearing has increased 6 percentage points. The unmet need has declined

from 19 percent in 1993-94 to 16 percent in 1996-97. According to conventional estimates the unmet need for family planning in Bangladesh is comparatively low mostly due to steady increase of contraceptive prevalence. However, poor contraception is virtually a quality-related issue of national family planning program. Use of condom especially by limiter may be less protective in regard to fertility preference because in Bangladesh its discontinuation rate is the highest (72 percent within a year); pregnancy rates also the highest (25 percent within 24 months) and failure rate more than two times higher than oral pill. Among different traditional methods successful use of periodic abstinence depends on correct knowledge of ovulatory cycle because without that women may experience unintended pregnancy. In Bangladesh, conventional limiting and spacing unmet needs and unconventional health-risk unmet needs vary significantly across administrative divisions. Unmet need is also related to the sex composition of living children. Women who have only girl are significantly more likely to have spacing unmet need, while limiting unmet need is more among women who have both boy and girl. However, the program can intervene into this communication process by directly approaching to males (husband) as for women.

052 Anonymous. The annual reports of the Chakaria Health and Demographic Surveillance System (Chakaria HDSS). Dhaka, ICDDR, B 2008.

The purpose of this study was to make awareness of the health and demographic surveillance system of Chakaria. Chakaria is one of the 465 upazilas (Sub-districts) in Bangladesh. It is located between latitudes 21”34 North and longitudes 91”54’ and 92”13’ East in the southeastern coast of the Bay of Bengal. Administratively, it is under Cox’s Bazaar district with a population of around 410,770 in 2006. The highway from Chittagong to Cox’s Bazar passes through Chakaria. The focus of the activities has been to facilitate local initiatives for the improvement of health of the villagers in general and of children, women, and the poor in particular. Thus, the activities of the project have been participatory with emphasis on empowering the people by raising awareness about health, inducing positive preventive behavior through health education, and providing technical assistance to any health initiatives taken by the village-based indigenous self-help organizations. The Chakaria HDSS covered 8 unions Baraitali, Kayerbil, Bheola Manik Char, Paschim Boro Bheola, Shahar bil, Kakara, Harbang, and Purba Boro Bheola. Of these, the last two unions formed the comparison area, and the first 6 formed the intervention area. In 1999, 106,320 people were living in 20,252 households in the intervention area and 34,418 people were living in 6,727 households in the comparison area. The Chakaria HDSS started in 1999 covering all the households in 8 unions; data collection was interrupted during 2001-2003. Since 2004, quarterly data collection has resumed and data are being collected from 3,727 and 3,315 systematically randomly-chosen households in the intervention and comparison areas respectively. 24 field-trained workers collected data during 2006. The data collectors were provided with written instructions for specific questions that required added explanations. Six supervisors supervised the data-collection process. To detect any anomalies, the supervisors re-visited 5% of the households, chosen randomly, within 2 days of data collection by the field workers. The age-sex composition is similar for all age-groups excepting the 20-24 years age group (55% male vs 45% female). One of the possible causes of the low proportion of females in the 20-24 year age group is the out migration of women of this age group from Chakaria. The health –related activities of ICDDR, B in Chakaria included facilitation of provision of safe motherhood services by the trained midwives who were based in the seven village health posts that had been established and managed by the villagers since the late nineties. The services provided by these midwives were not strictly restricted to the intervention area. The women from the comparison area also availed their services to some extent. A facility level index for the users’ households was calculated from the asset data obtained from the users, using the weights

associated with various assets derived from the Chakaria HDSS household data collected in 2006. The households of the users of the facilities were also divided into five groups on the basis of asset index scores using the cut off points of quintiles for the community. Proportions of users of the facilities in various asset quintiles were compared with those of the communities.

053 Anonymous. Assess reasons for non-use of contraceptive in demand based reproductive health commodity project areas. Dhaka: NIPORT, DBRHC Project and ACPR, 2007.

The Study was designed to investigate the reasons for non-use of contraceptive and as well as to identify major potential barriers to contraceptive use in DBRHCP areas to reduce the level of non-use of family planning. A cross sectional design used in this study to obtain information from the primary and secondary sources. Moreover, the study design tried to determine the factors related to use or non-use of contraception. Integrated approaches combining both qualitative and quantitative methods were adopted to conduct the study in two operations research Upazilas (Nabiganj Upazilla of Habiganj district and Raipur Upazilla of Lakshipur district). The study findings showed that the social environment of Raipur and Nabiganj are different. There were the electric supply, drinking water from deep/shallow tube well, sanitary latrine facilities, pit latrine, modern toilet and households' income facilities. But it had some different also. Level of education was also different in between two upazilas. The respondents in Raipur areas were much more likely than Nabiganj to have experience food deficit, sometimes or during the year. In general, Raipur respondents live in households with a higher living standard than Nabiganj respondents. The lack of formal education was more common among Nabiganj than Raipur women. Men were more likely to have attended school than women. The methods that most women knew were oral pill, injectables and female sterilization. Lower portion of women heard about traditional methods. Comparatively, Nabiganj women are less likely to have knowledge of family planning methods than Raipur women. Oral pills were most commonly used method, with about 55% of women in Raipur mentioning that they had even used oral pills while only 29% of women in Nabiganj had used this method. Even use of sterilization was low, with only 2.5 in Raipur and 1.3% in Nabiganj. Among husbands of Raipur 82% considered the decision to adopt as mainly a joint decision. No much difference was observed between the Nabiganj and Raipur respondents. The reason was given slightly more often of pill, injectables and IUD use, but it was the most frequently cited reason for the choice of the pill and injectables. Substantial proportions of users began dropping out within a short period of time after starting use. The principal reason for discontinuation of all methods was side effects of health concerns. Around two-thirds of discontinuations were attributed to side effects or health concerns. Many of the users who discontinued indicated that they stopped because they believed that they were no longer at risks of becoming pregnant because the husband was away. They were having sex in frequently, or they were unable to become pregnant for other reason. Almost half of the women became pregnant after abandoning use, while 5-7% returned to using contraception again. Choice of family size is still high since more than half of the respondents in Nabiganj and Raipur chose family sizes of three or more children. In both the areas, roughly, 90% of women who wanted another birth (soon or later) and about three-quarters of women who wanted no more births perceived that their husband felt the same. The other main reasons for non-use were unawareness of family planning methods/supply source, or suspected sub-fecundity because of long interval between births. Staffing, accessibility, infrastructure, contraceptive supplies and logistics, information, education and communication materials and quality of care are very much related to the readiness of service facilities. The study recommends that the results point to a number of actions that the family planning program should consider in efforts to reduce the level of unmet need in the areas. It is

also necessary to assemble provides and services that are convenient and acceptable to clients and should be able to respond to clients related health need.

054 Anonymous. Factors affecting family planning service in Char, Haor-Dip and Hill area. Dhaka: NIPORT, IDRF & CWS, 2010.

The study was intended to assess the affecting family planning services in Char, Haor, Dip and Hill areas of Bangladesh and to identify the determinants of use of contraceptives in the Char, Haor, Dip and Hill areas. Integrated approach combining both the qualitative and quantitative methods were adopted in study. Interview technique was adopted for canvassing the couple questionnaire. Female enumerators were generally engaged to get more accurate information from the female partner of the couple. One to one supervision was made to ensure accuracy and proving in asking questions. FGDs were held at the union and also at the upazila level to get information through discussion and consensus basis. The target population for this study were the eligible couples of disadvantaged areas namely char, haor-dip and hill areas. A total of 200 hundred households were listed from that area of around each UHFWC for further investigation of this study. The study finding showed that the peoples living in the char, haor-dip and hill areas are still suffering from different types of health hazards without having health care services and also family planning services from the UHFWC established at the union level although Government of Bangladesh has taken positive steps to reduce growth of population. The study reveals necessity for recommendation for establishment of UHFWC at the center of all the union of these areas with MO (preferably female and local) and trained staff such as FWVs, FWAs, SACMO, and Nurses Etc. The community suffers from inadequate services from them because of shortage manpower, short supply of materials. The FP field workers do not visit house to house to motivate the clients and distribute the FP materials at their residence. As a result the pace of FP programs has lost its momentum at the community level, particularly at the char, haor, dip and hill areas of Bangladesh. Study also revealed that the FP workers do not stay at their place of work always. As a result, the clients became deprived from the services at the time of need. FGD supported 21.2% failure in delivery of service and poor delivery of services. The FGD observed shortage of manpower (15%), backward communication (19%), irregular supply of family planning material (20%) etc. Therefore, the success of family planning activities depends not only on the raising of manpower, massive motivational activities, regular supply of contraceptive materials, regular follow up of supplies and services to remote areas but also on social mobilization, education and economic participation and solvency and empowerment of women. In the light of study findings, it is recommended to construct one or more UHFWC to each union as proportional to population and communication facilities and to renovate and or shift the UHFWC to the locally which is easily communicable secure and have all the essential facilities including privacy, regular water supply and toilet facility. It should be filled up all vacant posts of SACMOs, FWVs by females one and recruit at least one MBBS doctor for every two unions who will cover the both the unions by rotation.

055 Anonymous. Assess current unmet need of family planning and develop policy recommendation. Dhaka: NIPORT & Siam Health Care, 2010.

The major objective of this study was to review current unmet need for family planning with an aim to develop functional program strategies to reduce need for family planning services. An integrated approach combine with both qualitative and quantitative methods were adopted to conduct the study. The study used a cross sectional design to estimate unmet need for family planning and testing appropriate screening methods for identifying unmet need at community and

facility level. The study was implemented in two upazilas, one randomly selected high performing upazila-Manirampur of Jessore district (CAR more than 80%) and one randomly selected low performing upazila–Brahmanbaria Sadar (CAR 60% or less), Four unions from each of the selected upazila were selected randomly and a sampling frame was prepared. The sampling size from each of upazila was estimated as 486 (maximum). The present study observed that the proportion of unmet need is much more than the conventional estimate. One-third of currently married women have unmet need for family planning. This segment of women requires permanent or longer-acting method to fulfill limiting unmet need. But they have problem with method choice and due to that they need effective family planning services to avoid poor contraception unmet need. The study also observed that doorstep access to fieldworkers can significantly reduce spacing and health risk unmet need, which is almost half of total unmet need. In all respect Chittangong and Sylhet divisions have higher unmet need because contraceptive prevalence in both divisions is comparatively low. Very high prevalence of health-risk unmet need in both Sylhet and Chittagong division along with rural areas in Bangladesh may also be explained by socio-cultural hindrance belongs to the society. All these findings reflect unmet need related to sex preference and improper method choice. At present almost half of the method users are getting supplies from market sources without proper counseling and advice. Therefore, never users have significantly high unmet needs for limiting, spacing and health-risk, they should be educated about their problems and at the same time they should be motivated to accept contraception according to their need. Husband wife communication about FP can also help to reduce health risk, unmet need. The program can intervene into this communication process by directly approaching to males (husband) as for women.

056 Awwal AMMA; Ahmed T; Gias-uddin MS; Alam A; Bhadra SK; Sultana S; Abdullah AKM. Why east and west divide exists in family planning program outcome in Bangladesh: what needs to be done to further strengthen the family planning program? Dhaka: NIPORT, 2010.

The overall objective of the study was to critically examine the differential performances of family planning program that divides East and West through a systematic analysis of its proximate determinants. The study used data from Bangladesh Demographic and Health Survey (BDHS) 2007. The survey followed a stratified two-stage cluster sample design based on the 2001 census. At the first stage, 361 primary sampling units (PSU) were selected consisting of 239 rural units and 122 urban units with probability proportional to size (PPS). At the second stage, a random sample of households was selected from each of the PSU and all ever-married women of the selected households were interviewed, which in turn, successfully interviewed 10,996 ever-married women age 10-49. The study results showed that an average age was same in both the areas with 29±9 years. More than half a child was higher to the women of East as opposed to the West. The average education was same in both areas. The wealth index showed that respondents from East were relatively richer than the respondents from the West. For example, over 11% respondents were classified as the poorest in the East as compared to almost double in the West. This also showed that West had already achieved replacement fertility (i.e. 2.2). Inter quartile range was high for the East indicating that range of fertility was occurring high in the East than that of the West. This also shows that West had already achieved replacement fertility (i.e. 2.2). Inter quartile range was high for the East indicating that range of fertility was occurring high in the East than that of the West. The Q1, Q2 and Q3 showed the distribution of births in each quartile and the findings imply that in each quarter occurrence of births were higher in the East than that of the West. The average number of children ever born was higher in the East than that

of the West. The average children ever born were 2.7 children per woman in the East as opposed to 2.1 children per woman in the West. In the East, about 24 % women reported that they had no living children. The comparable percentage in the West was about 26%. Similarly, about 17% women in the East mentioned that they had two living children as against 24% in the West indicating that high mortality of the children may be one of the reasons for high fertility in the East. The average number of children dead in the East was 0.35 children as opposed to 0.24 children in the West. In the East, about 24 % women reported that they had no living children. The comparable percentage in the West was about 26%. Similarly, about 17% women in the East mentioned that they had two living children as against 24% in the West indicating that high mortality of the children may be one of the reasons for high fertility in the East. The average number of children dead in the East was 0.35 children as opposed to 0.24 children in the West. The percentage of women who desired more children was also high in the East than in the West (38 % as against 32%). The average desired number of children was higher in the East than that of the West (2.6 children in the East compared to 2.1 children in the West). With the increase in desired fertility, the discrepancy between actual and ideal children was low in both the areas. The percentage of women who desired more children was also high in the East than in the West (38 % as against 32%). There was a large variation in the use of contraception by East and West. In 1993-94 in the East 29.3% were current users of contraception and this has increased to about 41 % in 2007 an increase of 11.5%. Availability of family planning services at outreach areas had significant association with current contraceptive use in the West, but not in the East. Visit by family planning workers was strongly associated with current use of contraception in both East and West. Access to electricity was also associated with the current use of contraception in both areas. Although unmet need for contraception was significantly higher in the East than that of the West, it was difficult to reach women with family planning because of hard to reach areas in Sylhet and Chittagong. Detailed analysis shows that the clusters where unmet need was 25% - all (95%) were from the East (Sylhet and Chittagong). Age at marriage is still low in both the regions. This should be increased to legal age at marriage which is 18 years. In addition, women should be motivated to increase birth interval, particularly first birth interval. Teen age marriage and teen age fertility need to be socially discourage due to high risks involved with both health and fertility. Son preference is also a factor why women in the East are not adopting contraception. IEC materials and mass media should focus this issues with emphasis that son is no more a family wealth due to social, economic and cultural changes.

057 Awwal AMMA; Ahmed T; Gias-uddin MS; Alam A; Bhadra SK; Sultana S; Abdullah AKM. Unmet needs of family planning and its impact on growth rate in Bangladesh. Dhaka: NIPORT, 2010.

The aim of this analysis was to examine levels and trends in unmet need and the demand for family planning in Bangladesh and to identify factors associated with unmet need. The study used data from the BDHS 2007. This was a probability sample of 11000 ever married women of reproductive age. This is accomplished by means of logistic regression analysis. The mean age of the respondents was about half a year higher in the urban area than that of the rural area. About 58 % of the respondents had two or less living children at the time survey. However, roughly one in 10 women had no living child at the time survey with a mean number of children 2.4 children per woman. About one third of the respondents had no education; 91% were Muslims and only 9% from other religions. Similarly about one third of the women reported they are currently working; 38% were involved with NGO membership; 32% mentioned that they have exposure to TV and about 45% reported that they have access to electricity. Wealth quintiles show that poorest category is slightly less represented in the sample than that of the richest. Son preference

is still strong in Bangladesh and the number of living sons is known to have strong effects on the couple's motivation to use family planning. Over one fifth of the women reported they experienced child loss. This percentage is higher in rural area than in the urban area – not only because mortality is higher in rural areas but also fertility is also higher in the rural areas. The unmet need for contraception is also classified by poor contraception of unmet need of users and unmet need for health risk of non-users. And these two components also increased between 2004 and 2007 BDHS. About 48% were modern method users and the remaining over 8% were traditional method users. Non-users intend to use in future was 31% and over 13.2% respondents reported that they do not need to use family planning methods. In future, unmet need for family planning has increased between 2004 and 2007 BDHS. For example, unmet need for contraception increased from over 11.3 % in 2004 BDHS to little over 17 % in 2007 BDHS. The unmet need for contraception is also classified by poor contraception of unmet need of users and unmet need for health risk of non-users. About 17% of women have an unmet need for family planning and 27% have no need for family planning. Among those having a need, almost 24% have an unmet need. As evident with the increase in age of the respondents, the unmet need for family planning also declines. Unmet need is the highest for the age group 15-19; mothers with no living child; Sylhet division, rural women, The programmatic factors such as number of FWCs should be increased along with the recruitment of FWVs and FWAs to reduce unmet need for contraception in the hard to reach areas. Some women had no demand due to health reason and poor contraception; it may be recommended that IEC materials should be developed for these women to create demand for modern family planning methods. Husband and wife communication and approval of the use of family planning are low in the East and that of the West. In order to reduce unmet need for contraception husband's participation is crucial and mass media can play a significant role in changing the attitude of the man.

058 Azam SS; Ahmed MM; Bhuiyan MMR; Khan AW; Karim R. Contraceptive acceptance among selected low socio-economic group having at least-two children. ***Bangladesh Med Coll J.*** **2007; 12(2): 67-71**.

The objective of this study was to estimate the contraceptive among selected low socio-economic group having two children. This cross sectional study war carried out among 129 respondents where male respondents were between 20-50 years and families were between 15-49 years. The Study was conducted during 1 Jun–30 November 2002 at Tejgaon, Kapasia, and Gazipur. Information was collected from respondents by face to face interview through pre-tested questionnaire. Data was analyzed by the assistance of SPSS version 11.5. The study results showed that mean age of the male and female respondents was 30.2 & 4.2 years and female 29.7 ± 5.2 years. Acceptance of any contraceptive method was 93.7% and 8.0% among female and male respondents respectively. Temporary method was used by 84.5% female partners and only 4% by male partners. Among temporary method most of the female respondents used injectables (33%), and then oral pill (20%), CU-T (14%), Norplant (11%) and safe period method (6%), only 4% of the male respondents use condoms. Permanent methods (tubectomy and vasectomy) were adopted by 8.9% female respondents and by male respondents 4% only. Main causes for not adopting permanent methods were fear of operation in 13.1% female and in 42.2% male. Despite the higher rate of CPR, the TFR still more than the national data.

059 Bhuiya I; Rahman M; Rob U: Khan ME; Zahiduzzaman KM. Increasing dual protection among rickshaw pullers in Bangladesh. Dhaka: Population Council, 2007.

The main objective of the study was to increase contraceptive use among rickshaw pullers (RPs), with special emphasis on condom use. The study, conducted in six urban clinics of Dhaka Division, tested two strategies for delivery of information and services. A total of 5,494 RPs attended at least one educational session, 71 percent of these attended at least two sessions, and 43 percent attended all the three sessions. The first session, on family planning methods including condoms, was the most highly attended (75%), with 68 percent of RPs attending the session on other FP methods, and 66 percent attending the session on STIs and HIV. The study findings found that rickshaw pullers' knowledge on contraceptive methods increased significantly in both the experimental sites compared to the control site, with a greater overall improvement in the site of strategy. Knowledge of the dual role of condoms increased across all sites, but the change was significantly higher for Strategy I. Knowledge of consistent and correct use of condoms increased significantly in the experimental sites compared to the control site. Knowledge of prevention of STIs increased significantly in Strategy I, while knowledge of the transmission and prevention of HIV increased significantly in both the experimental site while no change observed in the control site. Use of any contraceptive method increased significantly in experimental sites, and condom use increased significantly in Strategy I, while no improvement was observed in the control site. However, translation of acquired knowledge about condoms into changes in risky behaviors does not seem to have happened as evidenced by the increase in extramarital sex across all groups. While this may represent a measurement issue rather than lack of behavior change, the need to focus on behavior change and not only information communication requires special attention during scale-up of the interventions. Therefore, the suggestions may be made that RPs should be given the opportunity to act as change agents, providing RH information and condom sales to their passengers and program managers should address missed opportunities by marketing the condom as an effective method for preventing both pregnancy and transmission f STIs.

060 Haider SJ; Ahammed MF; Chowdhury RMS; Islam MN; Chowdhery SS. Factors affecting use of temporary methods. Dhaka: NIPORT & READ, 2007.

The main objective of the study was to identify the factors influencing the acceptance of different temporary modern methods. Data for the study were collected using both qualitative and quantities techniques. The study used in formation mostly from female respondents, i.e. currently married women aged 10-49. This study also used secondary data from BDHS 2004 to supplement the primary data. Multistage sampling procedure and interview methods were used to obtain data. The respondents of the study were the current users of three temporary methods, such as oral pills (70%), injectables (20%) and condoms (10%). It is evident that the oral pill and injectable users by their average monthly family income belong close to either poor or lower income group (Tk. 5894 to Tk. 6390), while the users of condom by similar criteria belong to a little higher income group i.e., Tk. 8076.00 per month. The minimum monthly income of the users demonstrates that the users also belong to the poorest of hardcore poor group with monthly income between Taka. 600 to Taka. 1000 only. The usage of indictable has not been adopted by those who belong to very well off or the upper middle class. Knowledge about the three temporary methods, such as condoms, oral pills and injectable among the respondents in almost universal (93-100%). Nearly two third (63-70%) of the respondents know about ligation and IUD: Copper-T. Particularly slightly little more than one third of the oral pill users (39%) know about Norplant. Discouragingly very few respondents (temporary method users: wives) are aware of vasectomy (10 to 18%). About a quarter of respondents (27.7%) desired to switch the method that they are

currently using to a different method of F.P., meaning that three fourths of the current issuers do not intend to switch method that they are using. In the decision making process, about 4% of the wives felt that the decision to used method in future depended on husbands' desire. Almost all the respondents (96%) said that they consulted their husbands or use of FP method. About a half of the oral pill (47%) and injectable (48%) users said that they consulted their husbands after the birth of their first child. The findings reflecting that only 14% of the temporary method users ever considered using a long acting method of family planning. Majority of the FGD participants (56%) termed the quality of services in the family planning service centers as 'fair' or somewhat good while 44% termed it as bad and none identified it as very good. Training and retraining of FWAs, FPls and FWVs may be emphasized as measures to improve skills, commitments and job performances on the areas where these field personnel are currently assigning lower priorities. Field personnel may coordinate increasingly with the community leaders on planning, mobilizing and implementing services or consulting or side effects of family planning method users and MCH care to the pregnant mother. So, it is recommended that more in-depth investigations may be conducted to unfold the actual level of awareness about some of the methods of family planning, such as vasectomy and Norplant among the currently married eligible couples

061 Halder SJ; Ferdous S; Gias-uddin S: Alam H; Chowdhury SS; Nashir-uddin. Examine quality of care initiatives to improve the access of reproductive health including family planning care for people living in poverty. Dhaka: NIPORT & READ, 2010.

The specific objectives of the study were to: (i) ascertain the actual quality of care received by reproductive health and family planning rich and poor clients; (ii) analyze the current preparedness of service providers and facilities to deliver quality health and family planning service for the people living in poverty; (iii) assess the client satisfaction and utilization of health and family planning services; (iv) suggest ways and means for ensuring quality of care in health and family planning services for people living in poverty. This study used cross-sectional statistical design to obtain information from the primary, secondary and tertiary sources. Integrated approach combining qualitative and quantitative methods were adopted to conduct the study. Quantitative technique was applied through catchments area sample survey per selected (sample) service centers. Data collection period was January to February, 2010. Hundred percent of the targeted quantitative interviews (at household level) were completed. The study findings showed that 82% mothers received ANC during their last pregnancy. Highest proportion of ANC visits commenced in the FWCs (41%) followed by UHCs (14%), and MCs (12%). Majority of the respondents were examined physically during ANC visits. The proportion of deliveries performed by the untrained hand was higher in the rural areas (FWCs: 80%) than the urban (MCs: 60%); DHs: 59% and MCWCs: 60%) and semi urban areas (UHCs: 67%). More than one-third of the mothers (41%) received PNC after their last delivery. Majority of the respondents 33% (2-41%) received PNC at their residence of those who received PNC, 31% received it from the field level workers (FWA/FHA). About a quarter of the mothers received PNC from a doctor (24%). Out of which about two-third (68%) of the abortions occurred spontaneously, while the rest one-third (32%) were induced by the mothers themselves. More than two-third (71%) of the respondents were observed to receive child health care from different service facilities. The contraceptive prevalence rate observed in the current study is 65%. Acceptance of FP methods was slightly varied by poor (68%) and non-poor (62%). About one-third of the respondents (36%: 32-37%) opined that the counseling services rendered was insufficient. About two-third (70%: 57-76%) of the mothers were visited by field workers at their residence within last 3 months prior to the survey. The major recommendations ascertained analyzing the implications of the survey findings are: raise awareness among pregnant women through BCC and advocacy in the catchments of

service facilities targeting both poor and non-poor on; safe delivery as institutional delivery as well as improved ANC-PNC means ANC-PNC by skilled hands promote quality of contraceptive services particularly reducing drop outs of oral pills and advocating (intensive counseling) use of long acting and permanent methods as means to reduce TFR. Finally, the knowledge and skills of service providers and the institutional capacities of the service facilities (ensuring adequate logistics support) at various levels have to be further improved to render quality care with optimum levels of client coverage both at pre and post service stages.

062 Islam MA. Consistency in reporting contraception between spouses in Bangladesh: a multivariate analysis. *Journal of Statistical Studies*, 2010; 29:1-8.

This research paper was taken to investigate the extent of inconsistency in reporting of contraceptive use and hence identify the significant determinants of such in consistencies. The study used the couple dataset (N=2249) based on the 1999-2000 Bangladesh Demographic and Health Survey (BDHS) 2001.l The couple data set was generated by linking the spouses for the mole data set constituting a sample of 2556 currently married men aged 15-49 years and that from families which has a sample of 10,544 over married women aged 10-49 years. A two level random intercept binary logistic regression model will be fitted to identify the significant determinants of the response variable, as well as, to identify probable community level variation in the data. The study result revealed that among the couples, 76.5% provided a consistent response, in that both partners said thought they were either currently using the same method or not using any method during the survey period. About 65% of husbands, among the couples, reported that they were using a FP method compared with 59.5% of wives. Most of the discrepancies are observed when husbands report using the methods while wives report non-use of the methods. The reasons behind husbands report of pill use while wife reported non-use may be that husband paid for the pill or collected the pill, or knew that his wife have started using pill. In the table two, relationship of consistent reporting of contraception with some important socio-economic and demographic characteristics of husbands, wives and couples. Both current use and non use are considered in measuring the consistent reporting. Husbands from Rajshahi division provided the highest level of consistency in reporting of contraception (80.4%) where as Khulna division exhibited the lowest level (70.3%). Surprisingly consistent reporting is high among rural husbands. Regarding the analysis of data, there is a considerable amount of inconsistency in the use reports of contraception between spouses in Bangladesh. Couple communication regarding FP may help reducing the inconsistency in reporting of contraception between spouses. There should be a separate study to investigate if some husbands are reporting condom use outside of married. Divisional, rural/urban and community level variation were observed in the data which required policy attention.

063 Kabir H; Gazi R; Ashraf A; Saha NC. Impact of an in-built monitoring system on family planning performance in rural Bangladesh. *Human Resources for Health*. 2007; 5:16, doi :10.1186/1478-4491-5-216.

These interventions were aimed at improving the planning mechanisms and for reviewing the problem solving processes to build an effective monitoring system of the interventions at the local level of the overall system of the MOH&FW, Government of Bangladesh. The interventions included development and testing of innovative solutions in service-delivery, provision of door-step injectables, and strengthening of the management information system (MIS). The impact of an in-built monitoring system on the overall performance was assessed during the period from June 1995 to December 1996, after the withdrawal of the interventions in 1992. The intervention

results of the assessment showed that Family Welfare Assistants (FWAs) increased household-visits within the last two months, and there was a higher use of service-delivery points even after the withdrawal of the interventions. The results of the cluster surveys, conducted in 1996, showed that the selected indicators of health and family-planning services were higher than those reported by the Bangladesh Demographic and Health Survey (BDHS) 1996-997. During June 1995 - December 1996, the contraceptive prevalence rate (CPR) increased by 13 percentage points (i.e. from 40% to 53%). Compared to the national CPR (49%), this increase was statistically significant ($p<0.05$). In fine it may come into a conclusion that the in-built monitoring systems, including effective MIS, accompanied by rapid assessments and review of performance by the program managers, have potentials to improve family planning performance in low-performing areas.

064 Khan TI; Naher L; Akhter S. Knowledge and practices of emergency contraceptives among the newly married couples in Bangladesh. Dhaka: BIRPERHT, 2009.

The study was initiated to identify the level of knowledge gap and practice of Emergency contraceptive pill (ECP) among the newly married couples in Bangladesh. It was a cross sectional survey and was conducted among the newly married couples. Data were collected from thirty-six unions of twelve Upazilas under six districts of six administrative divisions of Bangladesh. A total of 2293 newly married women and 1635 husbands were interviewed through structured questionnaire by trained interviewer. In the study 289 service providers from the study sites were also interviewed. The study findings revealed that education of the couples concerned in the study, secondary level of education was higher among the women (61.4%) than their counterpart, where it was account for 47%. Majority of the women marred at the age between (15-19) years and half of the husband's married at the age between 2—25 years and 29.7% married at the age between 25-30 years. Pertaining to contraceptive use, it was found that half of the respondents used contraceptives and another half did not use any sort of contraceptives. Among the non user, 60% are still undecided. Regarding knowledge about contraceptive in emergency was reported comparatively higher in Barisal (36%), Chittagong (34.3), Dhaka (29.8%), Rajshahi 22.7%) and Sylhet 17.2) respectively. Lowest percentage was found in Khulna (8.8%). With in the division the knowledge about ECP is found slightly higher in non sadar upazila (14.9%) than in sadar upazila (12.7%).The use of ECP is found little higher among the women of non sadar upazila than the sadar upazila. More than three fourth (76%) of the respondents reported that heath worker visited their home. About media exposure 60% women never listen to radio and only one third listen sometimes. In the light of the current research findings, priority should be given to newly couple in immediate need of contraceptive services, i.e., those who are at the most fertile period and do not want any children yet. To educate the newly married couples about the ECP as back-up support of family planning method. Proper knowledge about ECP and source of availability of supply or services may directly increase acceptance of ECP. Existing family planning program should be strengthened appropriately in the less contraceptive prevalence areas like Chittagong and Sylhet.

065 Khan TI; Naher L; Akhter S. Report on knowledge, attitude and practice of emergency contraception among the Government and Non-Government services providers. Dhaka: NIPORT & BIRPERHT, 2008.

This study was conducted to assess the service providers' knowledge on different types of emergency contraceptive methods, their attitude and practice on emergency contraception and to remove the barriers of providing emergency contraception to the acceptors. The study was a cross

sectional survey and was conducted among the health and family planning service providers of both government and non-government sectors as well as drug seller and quack physicians. A total of 4652 respondents were interviewed through structured questionnaire by trained interviewer. In the study population, 3285 were service providers and 1367 were drug seller/pharmacists. The findings of the study showed that it was found 90% of the service providers provided advice to their client unprotected sex for prevention of conception and the proportion was higher among the govt. service providers (96.3%) compared to non-govt providers (82.9%). Among the service providers 95% heard the name ECP. From the study findings it found that the provider had knowledge about ECP but in some instances are there for exiting some gaps. The gaps are about time initiation of ECP and its contraindication. Regarding the barriers to introduction of ECP in Bangladesh, majority of the service providers opined that lack of poor publicity 95.5% followed by less familiarity of the ECP 91.3%, lack of correct information 89.4%, less supply 33.5%, less eagerness of the client 30.4% and any other information 2.3%. Regarding the drug sellers, majority of the respondents had no academic degree. Only 8.5% had LMF followed by pharmacist certificate degree 6.6% and very few had RMP, DMA degree. Most of the respondents mentioned that they think it is used for family planning purposed followed by to regularize the menstruation an d15% had no knowledge at all. In fine, it may be suggested that the measures should be taken for creating knowledge and awareness about the emergency contraception pill and its uses widely.

066 Mahabub-ul-Anwar M; Arifeen A; Hena IA; Rahman MM. Rational use of modern contraceptive methods during the reproductive life cycle. Dhaka: Population Council, DBRHCP, 2009.

The aim of the study was to test a behavioral change communication and service-delivery model designed to increase the rational use of modern contraceptive methods among rural women. The study was conducted in two low-performing rural areas (Nabigonj and Raipur) in Bangladesh. To test the hypotheses, a quasi-experimental, nonequivalent control group design was used in this study. Data were collected through pre- and post-intervention surveys of eligible women and service providers. Readiness of health facilities was also assessed through inventory and observation. To measure the impact of the interventions, currently married women aged 18-45 years, who had ever-used modern contraceptives, were interviewed. The findings of the study showed that the capacity of the service providers was improved through various training programs. After the raining, the service providers were more likely to inform clients about all available contraceptive methods and the probable side-effects of each method. This strategies intervention helped increase awareness of FP and RH issues and availability of services for the community, resulting in increased use of those services by the community people. They contacted community members in one to one sessions and in group sessions and motivated to accept appropriate family planning methods. There was a variation in the performance of peer promoters in conducting BCC sessions across the study areas, with overall performance being relatively better in Nabiganj than in Raipur, mainly due to differences in the educational level of the peer promoters. The level of knowledge of respondents about modern contraceptive method was quite high in both intervention and control areas, with some variations. However, their knowledge on all the modern contraceptive methods was not uniform in all the areas. There was a significant increase in the use of LA/PMs in the intervention areas, while little change was observed in the control areas. In Raipur, the use of LA/PMs increased from 5.8 to 10.0 percent, which could be attributed to higher use of Norplant and sterilization. In Nabiganj, the proportions of sterilization and IUD acceptors increased from 4.2 to 6.9 percent and from 2.3 to 4.4 percent respectively, while no significant change was observed in the control areas. The discontinuation rates of pill, IUD, injectables and condom were relatively higher in Raipur than in Nabiganj. The overall

discontinuation rate of the IUD and injectables reduced over the intervention period, while the opposite trend was observed for the pill. Clients in a friendly manner, counseling on FP methods, maintaining confidentiality, using BCC materials, and requesting follow up visits suggest improvement in the intervention areas; this improvement was relatively higher in Raipur than in Nabiganj. However, there was yet room for further improvement of the quality of services in both the areas.

067 Naher L; Akhter S. Assessment of attitude, belief and acceptability of religious leaders about family planning, maternal and child health care services. Dhaka: NIPORT & BIRPERHT, 2010.

The study was conducted to determine the attitude, belief and acceptability of religious leaders about family planning, maternal and child health care services. The study was a community based cross sectional survey and was carried out on a representative sample of Bangladeshi religious leaders in the greater four divisions of Bangladesh which involves face to face interviews. The eligible respondents were interviewed through structured questionnaires administered by well trained male interviews prior to obtaining appropriate consent. The study found that most of the religious leaders have knowledge about oral pill (98.3%) and condom (90.8%) as contraceptive method. Among the respondents more than 55% religious wives use oral pill. Nearly 8.3% practice withdrawal method and 9.5% maintain safe period. Oral pill was found most preferable method among the religious leaders. Nearly two-third of the respondents was found having positive attitude towards family planning methods use. However, 16% religious leader opined that contraceptive use is forbidden in the religion and few of them do not use family planning method due to religious restriction. Discouragement of contraception is more both in alias and kawami madrasa education and quite less in Bangla and technical medium. The difference is found to be statistically significant (P<.05). Majority of the respondents (70%) gathered information about contraceptive methods through mass media such as radio and television. Nearly 60% religious leaders opined that mass media should be involved largely to enhance publicity of contraceptive methods. Majority of them reported that family planning methods are available at pharmacy. Others reported source of contraceptive methods are FWA (52.7%), Heath Assistant and H&FWC (30%). Regarding the knowledge about the danger sign of pregnancy, 50.4% said excessive bleeding, 26.8% said high blood pressure, 31% said High Fever, 57.7% said Eclampsia/Convultion, 48% said leg edema and 26.2% said severe headache. However, two-third of the religious leader's wife received ANC during last pregnancy. Regarding problems that hiders effective MCH service, 8.8% said about transport problem, 12.4% said about lack of doctor, 8.4% said about long distance of the health facility, 9.2% said about scarcity of medicine/instrument at facility. However, 64.6% said, there is no problem. Abort the peri-natal death, 46.9% mentioned tetanus, 20.8% said fever, 46.1% LBW, 9.5% reported jaundice, 35.1% diarrhea and 80.6% pneumonia. In the conclusion, it is suggested that more orientation and training program should be undertaken to improve their attitude about the family planning and seminar/workshops may be arrange in the village level there could also be approached the religious leaders about the FP program. Family planning in the religious education must be incorporated for eradication of misconception about the family planning and they must be attended in the advocacy program also.

068 Rob U; Talukder MN; Khan AKMZU. Urban family planning program: issues and challenges. Dhaka: Population Council, 2010.

The workshop was organized to identify issues and challenges facing family planning in the urban area and to develop future course of the urban family planning program. It was carried out to take appropriate planning activities and impact of issues and challenges. Bangladesh has one of the highest rates of growth of urban population among developing countries. Between 1990 and 2000, the urban population in Bangladesh experienced an annual growth rate of 5.6 percent. By the year 2030, approximately 40 percent of the country's population is expected to live in urban areas, where the demand for an affordable health system will be critical. For this teeming urban population, there is no structured family planning service. For ensuring continuous family planning services in urban areas in the context of upcoming mammoth future urban population, it is critical to develop a sustainable primary health care structure with the thrust on family planning services. However, there are several challenges to do that. The critical one is the absence of a "strategy" for providing primary health care and family planning services to the urban population. The fertility among women living in slum areas is higher compared to women living in non-slum areas. Total fertility rate is 2.5 per woman in the slum while it is 1.9 in the non-slum area. Fifty-eight percent of the women in the slum area using any contraceptive methods compared to 63 percent of the women in the non-slum. In the urban area, the majority of users obtain their methods from non-government medical sources. Pharmacies play a lead role in the urban family planning services. One-fifth of the acceptors get their methods from non-governmental organization (NGO) sector. On the basis of the findings from the workshop, priority areas for future program have been identified, which include: Inadequate coordination between MOHFW and MO-LGRDC is the major challenge. Considering the large urban population of the country, and the mode of operation of the government machinery, development of an urban primary health care and family planning was main headache to formulate an urban family planning policy. The fundamental problem of urban family planning program is the absence of a comprehensive service delivery structure. It is necessary to develop physical infrastructure to provide services as a way to ensure sustainability of the urban program. Slums are growing in huge numbers; therefore, demand for health and family planning services among slum dwellers will be intense. NGOs play an important role in providing subsidized health and family planning services to a limited proportion of the slum population.

069 Rob U; Talukder MN. Strengthening health and family planning services in low performing and hard-to-reach areas of Bangladesh: workshop report. Dhaka: Population Council, 2008.

The objective of the workshop were to: i) review the current and emerging health and family planning issues particularly in low performing and hard-to-reach areas; ii) identify areas of deficiency in the service delivery; and iii) develop strategies for improving the performance of the health and population sector in low performing and hard-to-reach areas. Deliberations and discussions at the workshop were centered on three broad areas: i) human recourse and infrastructure; ii) BCC and advocacy; iii) supplies and logistic. Bangladesh has made significant prepress in redwing infant and child mortality. Bangladesh is performing well in several of the targets of health related MDG. However, principal health development challenges which include: *) Attaining the replacement level fertility *) Reducing maternal and neonatal deaths. Several human resources issues were identified at the workshop, which are considered as barriers to providing quality health and family planning services in rural areas. The key problem identified was the inadequate number of vacant posts at the field level has been identified as the major

weakness in the service delivery. A special program for two years should be undertaken to address the issues of immediate concern. Strengthening the public health and family planning sectors should be the foremost priority, as public sector makes cheaper service available across country. Human resource situation can be improved by filling up the vacant posts of service providers and field workers. Special attention should be given to "Char" areas with special incentives.

070 Saha UR; Bairagi R. Inconsistencies in the relationship between contraceptive use and fertility in Bangladesh. *International Family Planning Perspectives*. 2007; 33(1): 31-37.

The study was conducted to examine the lack of change in fertility and to determine relationships among contraceptive prevalence, the abortion ratio, desired fertility and total fertility. Data from the 1999-2000 Bangladesh Demographic and Health Survey and from the Matlab Demographic Surveillance System area collected between 1978 and 2001 were analyzed to deforming the lack of change in fertility and relationship between contraception with fertility situation. In the DSS community health workers have colleted data on births, deaths and migration in semi-monthly home visits since 1966, and in monthly visits since 1997. The study found that maternal and child health and family planning program was initiated in part of Matlab in 1977, the total fertility rate in the intervention area declined from 4.8 in 1979 to 2.9 in 2000, while fertility in the comparison area dropped from 6.3 to 3.5. Over this period contraceptive prevalence rose from 30% to 70% and from 16% to 50% in the two areas, respectively; meanwhile, the abortion ration fell from 4.3 to 3.6 in the intervention area, but rose from around two to 8.2 in the comparison area. Trends in desired fertility in each area were similar, declining from about 4.0 children per women in 1979 to about 2.5 children in 2000. Among women at each of parity, fertility generally decreased as the number of sons increased, and fertility was highest for women without sons. Preference for male children and parental concern over infant and child mortality may partially explain the difference between desired family size and fertility. A reduction in breast feeding and an increase in use of less effective contraceptive methods might be responsible for the inconsistency in the relationship between contraceptive and fertility.

071 Sattar MA; Rashid MA; Alam MA; Rashid HA; Akhter A; Sultana J. Knowledge and attitude of pregnant women about birth planning process. *South Asian Journal of Population and Health.* 2009 July; 2(2): 151-158.

The overall objective of the study was to assess knowledge and behavior of pregnant women about birth planning process in rural Bangladesh. The study followed a cross sectional statistical design. Multistage random sampling procedure was used to select samples. Both quantitative and qualitative methods were used to collect information. Specifically data were collected through in-depth interview using semi-structured questionnaire. The study finding clearly showed that in practice, no respondents have complete knowledge about different steps of birth planning process. After prompting some of the respondents gave partially positive answers regarding the steps and events of birth planning process. About 68 percent women have correct knowledge about government sanctioned age of marriage. Most women (74%) were aware about government encouraged age at first birth. Knowledge about contraceptive methods was universal among the pregnant women. However, only 67 percent pregnant women had used any contraceptive method before current pregnancy. About 83 percent women viewed that the first pregnancy happened according to their desire and more than two-thirds (68%) women had their first pregnancy within 1-3 years of marriage. About 68 percent pregnant women could say the consequences of early marriage, while 70 percent pregnant women have understanding on major complications supposed to face during pregnancy. About two-thirds pregnant women were aware about availability of services. However, 30 percent mothers have knowledge about care of mother and child. The most

common source of service is government service providers and field workers (87.9 %) and 85.9 percent women identified public facilities as the key service center. So, it is clear from the study that many field workers need training. The supervisor should give importance on the job oriented training when they visit centers/field. The training should be field oriented and practical.

072 Talukder MN; Rob U; Rahman M. Improving the quality of family planning and reproductive tract infection services for urban slum populations. Dhaka: DBRHCP, NIPORT & Population Council, 2009.

The aim of this study was to test a service delivery model to deliver client-centered FP and RTI services in order to improve the reproductive health of couples living in urban slums. This study used a separate sample pretest-posttest design with selected NGO clinics providing services in slums of Dhaka city. The target population was married women aged 18-45 years who had received services from the selected static and satellite clinics and lived in the catchments slums of these static and satellite clinics. Shimantik clinic in Khilgaon and Marie Stopes's clinic in Mohammadpur were selected as intervention clinics. The sample size was estimated to be 600 married women aged 18-45 years who received FP or RTI services from the selected clinics. The study results showed that there is improvement in counseling; some service providers do not follow the standard screening criteria for modern contraceptive methods. It also found that a remarkable improvement in the service providers competence in screening related to clients fears/misconceptions about contraceptive methods almost all the clients (97%) were asked this information while it was only 34% before the interventions. Approximately 80% of the clients were provided services immediately, given appointment and/or referred. The proportion of the cages where service providers used BCC materials increased from 13% to 51%. Service providers' unwillingness in using BCC materials during counseling was identified, which needs special attention of the service providers and effective supervision. For achieving expected level of quality in services effective supervision and encouragement from senior ossified is necessary. Couples who have completed their desired family size should be motivated to use long term methods.

2.3 REPRODUCTIVE HEALTH (maternal health, adolescent health, antenatal, post natal, and delivery care, etc.)

073 Akter D; Chowdhury S; Rahman A. Health seeking behavior of women with obstructed labor attending in tertiary level hospitals of Dhaka city. *ICMH Journal*. 2010; 1(1): 5-10.

The study was conducted to explore the knowledge, attitude and practices of mothers/caregivers contributing to obstructed labor, to determine the causes of obstructed labor and to find out the mode of delivery and to identify the maternal consequences and foetal outcome. This was a cross-sectional study done in two tertiary level hospitals (ICMH and DMCH) over a period of 6 months from July to December 2002. One hundred patients with obstructed labor attended consecutively were included in this study. Structured questionnaire was used for data collection. One hundred pregnant women with obstructed labor have been studied. The study revealed that fifty percent of patients came from rural area, 72% were living in the kaccha house, 52% of them had no formal education, and 82% of patient's husbands were day labor and cultivator. Primigravida were 52%, 95% of patients had no knowledge about pre-connectional health cheek up. Fifty percent had no knowledge about antenatal care, 96% had no knowledge about the consequences of obstructed labor. Eighty percent of the patients had negative attitude towards hospital delivery. In 65% cases delivery were tried on bare floor without sheet, per-vaginal examination was done by ungloved hand in 93% cases, 90% deliveries were attended by TBA, P/V examination was done 5-8 times in 55% cases, 57% cases used unhygienic material as a lubricant during P/V examination, drugs used for augmentation of labor in 52% cases, seventy percent of patients attended in the hospital after 24 hours of labor pain, 89% presented with foetal distress and 90% patients were delivered by caesarean section, maternal morbidities were rupture uterus (5%), VVF (2%), puerperal sepsis (20%), wound infection (84%) and one patient was died due to ruptured uterus. Fifty two percent newborn were asphyxiated, 43% were stillborn and prenatal mortality were 53%. The result showed poor birth preparedness for safe delivery, poor antenatal attendance and unhygienic practices by unskilled birth attendance during delivery and high foetal morbidity and mortality and high maternal morbidities.

074 Alam MA; Nahar S; Yasmin N; Lahiry S; Karim N. Newborn care practice among the tea plantation workers in Bangladesh. *SUBJPH*. 2009 -2010; 2(2)-3(4):7-14.

The present study aimed to examine the newborn care practice and rituals of the tea plantation workers and to know their health seeking behavior in post delivery period, and to find out the level of knowledge among the mothers about newborn care. The study was conducted in four tea gardens/estates of Madhabpur Upazilla of Habiganj district in Sylhet division. The purposively selected gardens are Jagadishpur, Noyapara, Surma, and Telipara Tea garden/estate. The study period was four months from May 2009 to August 2009. All the mothers having child under 1 year of old of the study area were the study population, Besides descriptive analyses chi square test were done to see whether the exposure is significant or not. The main study findings revealed that 57.8% mother has knowledge about ANC during pregnancy. Most of the mothers (96%) have knowledge about danger sign during pregnancy and TT injection during or before pregnancy. But 58.9% mother has no knowledge about newborn danger sign. Regarding newborn care most of the workers first feed honey to their babies, 62.9% workers cut the umbilical cord by blade, 33.8% cut by knife and only 3.3% cut by a telong (slice of bamboo). 47.6% use warm oil and 25% use dry goat's stool to dry the babies cord. 90.9% workers use cloth with warm water to wash the baby. About 37.1% first bath their baby within 2-4 hours and after birth while 50% workers wrapped

their baby after one hour. When babies get sick 87.3% workers go to the hospital and 27.7% get to the traditional healers. Regarding sickness pattern 40% of the newborn was found to have suffered from diarrhea, 33.33% by tetanus, 13.33% by birth asphyxia and only 6.6% from pneumonia, The present small scale study does not reflect the total scenario of newborn care practice of tea plantation workers of Bangladesh, but the findings have identified the necessity of appropriate reproductive health and hygiene program for them.

075 Ali Z. Divergent maternal and child health outcomes in Bangladesh: a Tale of two Upzilas. *The Bangladesh Development Studies*. 2010 Sept; 33(3): 113-129.

This paper had given attention to seek answer to the question why some regions being economically better off are performing poorly in respect of maternal and child health outcomes compared with those which are other wise (economically) worse of than the former. For analyzing the data obtained from two purposively selected upazilas in Bangladesh one is Rajnagar upazilla of Moulavibazar district and Saturia upazila of Manikgonj district. Structural questionnaires semi structured interview schedule and checklist for FGD instrument had been uses for data collection. It also tried to explore the factors responsible for better maternal and child health outcomes. The study found that the impact of better health service delivery system is much stronger than that of growth and the other factors on health outcomes. It also found that ensuring "accountability of the health service providers is a key factor to provide health service delivery, Maternal mortality ration in Bangladesh is also among the highest in the world although it has decline from 578 per 100,000 live births in 1990 to 400, in 2000 and 391 in 2002 (Ali and begum 2006). The observing upazillas there were considerable differences between the quality of services delivered in the two upazilla with Saturia providing better services, And these difference in services are producing different levels of outcomes in the two upazillas. From the data presented in this article, two points emerged: (i) monitoring of service delivery by the higher authority; and (ii) participation of local govt. in the delivery of health service inputs at the local levels. Knowledge and attitude may have some effect on a health outcome. The study finally recommended that for implementing an appropriate monitoring system to make the providers accountable is therefore key to ensure delivery of quality services at the local levels.

076 Anonymous. Evaluation of EOC services in MCWC. Dhaka: NIPORT and ARTCOP, 2007.

The objective of this study was to examine the extent and nature of MC-RH and family planning services provided by the service providers and their participation in providing services and management of clinics. This also assesses availability of medicine and other supplies including family planning methods. If also attempted to investigate the level of awareness and perception of community member about services provided and matter related to service provider. The study followed a cross sectional statistical design to obtain information from the primary and secondary sources which comprise all relevant categories of respondents. A total of 734 samples (72 program managers, 102 services providers and 560 pregnant women) were selected for the interview. Random sampling procedure was used to select the MCWCs. out of 30 MCWC, 15 MCWC were randomly selected for observation. Both quantitative and qualitative methods were used to collect data for the study. The results of the study showed that the average age of pregnant women was 23.7 years. In this study about 93% of women were currently pregnant. Of them 47.7% were in their 1st trimester, 30.5% in their 2nd trimester and 21.8% in their 3rd trimester of pregnancy. Largest majority of respondents were housewives (94.4%) and the majority had 6-10 years of schooling (56%). The responses of pregnant women were limited to a few services only.

On ANC services they mentioned that these included inculcation and vaccination of pregnant women (22.5%), advice or care for self and children (23%), measuring weight, height, and BP (22.5%) and advice on nutrition to pregnant women (16%). About a quarter (24.7%) had their last deliveries in the services centre. On an average, they spent Tk. 200 to 500 for the services. About 14% of the respondents visited centre for C.S. operation. More than two-third went for contraceptive services; or danger signal of pregnancy, 49% knew about toxemias, 33% bleeding per vagina and 34.5% knew about the anemia of pregnancy. Some total about delayed labor and wrong position of fetus. About 72% respondents told EOC services were good and half of the respondents told provided service were bad. The service providers (M.O, Clinical, Anesthesist, FWVs and SACMOs) informed that most of the clients went to the clinic for ANC, PNC, delivery of children and general treatment. The service providers opined that they faced the problems about to provide MC-RH service in the MCWC were poor supply of medicine (50%) fewer number of beds, shortage of health workers, shortage of physicians and accommodation problem of the health workers (16-20%). Causation of non-use of service centre were, lack of awareness of the problems related to pregnancy and their effects on them (79%) lack of information about the service centre (31%), resistance from mother in low, relatives, husbands, financial problems, lack of poor communication and lack of company to go to centre (30-60%). Program Managers informed that most clients were satisfied with the service provided in the MCWCs. Poor attendance in the centre by the pregnant mothers was lack of knowledge on danger signal of pregnancy and its effect (86%), resistance from mothers-in-law and husband. The study recommended that effort should be made to involve field workers of different agencies including NGOs involved with related to reproductive health care, field oriented training program should be conducted to improve knowledge and skill of the field worker with emphasis on training of FWVs and also the EOC team and program managers should be developed for better provision of service of EOC and finally, the effort should be made to involve the community leaders in reproductive health care in services and orientation program for them should be arranged regularly.

077 Anonymous. Antenatal care services in Bangladesh: it's effectiveness in terms of achievements and missed opportunities. Dhaka: NIPORT & Institute of Health Economics (D.U), 2010.

The study aimed to examine the current use pattern, differentials, and trends of antenatal care services in Bangladesh. Moreover content of antenatal care, providers and its relationship to care at delivery as well as missed opportunities in providing antenatal care services were reviewed. Secondary data from the last five BDHS surveys used for the trend analysis of the study. A cross sectional sample design was also adopted to obtain information for the study. An integrated approach combine with both qualitative and quantitative methods was used in the analysis. The study also used the information derived mostly from clients, and service providers. In-depth interview, case studies and focus group discussion were initiated to obtain study information. The study results found that among safe motherhood advocates, antenatal care has been downplayed in recent years as an intervention for reducing maternal mortality. Most safe motherhood programs therefore currently stress ensuring access to emergency obstetric care and ensuring that all women benefit from the care of a skilled care professional during delivery. It is not surprising that little attention has been paid to pattern and trends in antenatal care use. Yet there is ample evidence that care during the antenatal period represents an opportunity to deliver interventions that will improve maternal health, prenatal health and more than likely perinatal survival. Moreover, the HIV/AIDS epidemic has directed more attention to the antenatal period as an entry point for HIV prevention and care initiatives. In Bangladesh, as a whole, women with secondary or higher education are more likely to have antenatal care than women with no education, and the

disparities are even more marked for four or more visits. Overall, women with secondary education are twice more likely to have antenatal care than women with no education. Age does not appear to be a significant determinant of use of antenatal care; although older women do have slightly lower levels of antenatal care use than women under 35, the differences are not marked. In all divisions, the poorest fifth of the population is less likely to have antenatal care than the richest fifth. Therefore, greater efforts are needed to improve the content and quality of services offered. In addition, increased attention is needed to ensure that particular groups of women specially those living in rural areas, the poor and the less educated, obtain better access to antenatal services.

078 Anonymous. Research study on youth and adolescent: final report. Dhaka: NIPORT, UNFPA, Bangladesh and Institute of Health Economics, University of Dhaka, 2008.

The purpose of the study was to collect data to assist in the tracking of progress and to evaluate the impact of the HNPSP interventions and the comparison of the effectiveness of different strategies for empowerment of adolescent girls. The study was conducted in two phases. Firstly using available secondary data of Bangladesh Demographic and Health Survey (BDHS) were used to obtain the quantitative information while in-depth interviewed, case study and focus group discussions were done to obtain qualitative information on sexual and reproductive health of young adolescents. An integrated approach combining both qualitative and quantitative methods was adopted to conduct the study. The study results indicated that one fourth of the populations are below 10 years of age. Nearly one-third of the population fall in 10-24 years age group, which constitutes over 44 million in member - more than half of them females and 78% live in rural areas. In 2007, 55% young women and 46% of young men had attained secondary or more education compared with 3% of young women and 6% of young women twelve years age. Moreover, current data showed that, adolescent women are more likely to have some secondary level education than adolescent men. Regarding media exposure, about 54% of young women and 74% of young men watch television at least once a week, and 25% of young women and 48% of young men listen to the radio at least once a week. More than one-third of young women and 15% of young men have no exposure to mass media. Sixty-three percent of women are not involved at all in decision about seeking health care for themselves, while 66% are not involved in decision about purchasing large household items or visiting friends or relatives. Since 1975, there has bean a decline in the mean number of children ever born for women age 15-19, from 2.3 children in 1975 to 1.3 children in 2007. In Bangladesh most of the adolescents had some awareness of reproductive health including information about puberty, childbirth and pregnancy related problems. Reproductive health is not discussed in most families, and sex education is completely absent in schools. Most of the adolescent couples are unable to make their decision of their own. Most of the participants were in favor of involving adolescent man in reproductive health. They felt that socialization determines sexual behaviors, gender ideologies, social and familial roles. A very young woman is aware about the STIs. But most of adolescents are aware of HIV/AIDS, and know its modes of transmission. However, correct information on how HIV is transmitted was much lower. In Bangladesh about two-fifth of adolescent women are under-weight (BMI< 18.5 kg/m^2). The contraceptive prevalence rate among adolescent married women has increased from 25% 1993-94 to 40% in 2007. Although 30% of young adolescent do not intend to use contraceptives because of opposition to family planning by themselves, their husband, or others or because of religious prohibitions.. Overall, 69% adolescent mothers received two or more T.T. injections during pregnancy, while another 18% received one injection. The data showed that only 22% of adolescent mothers in Bangladesh received postnatal care from a medically trained provider within 42 days after delivery. The results of the study also suggested that target

communication efforts for promoting positive attitudes about women's role especially in reproductive decision making were likely not only to improve women's status but also to contribute to increased use of reproductive health services.

079 Anonymous. Reproductive health commodity projection for Bangladesh, Dhaka: NIPORT and Department of Statistics, DU, 2007.

The purpose of this exercise was to project the contraceptive commodity requirements keeping in mind the vision of the family planning program. A total of eight sets of projections and associated contraceptive commodity requirements were made using the Kaplan model. The Kaplan system of models is designed to help development planners to transform their policies into implementation and operational plans. The different scenarios were generated in this study include: fulfilling the unmet need for contraception, achieving replacement level of fertility goal by 2010, converting intends into users, increasing male participation in male sterilization, reducing proportion married among adolescents aged 15-19, increasing use effectiveness of pill and condom; elimination the unmet need for poor contraception, increasing long acting method IUD etc. These suggest that there is a scope for increasing CPR given the situation. If proportion of currently married can be reduced at adolescent ages, then it will have significant impact on the commodity requirements as well as reaching demographic goals by 2010. For instance, under the assumption of eliminating unmet need for poor contraception, the acceptors will be doubled between 2001 and 2010 as against only 30% increase if we reduce proportion married at adolescent ages. Similarly, there will be changes in the users under the two scenarios between 2001 and 2010. Since there will be fewer users if the reduction in the proportion currently married at adolescent ages is implemented, the contraceptive commodity requirements will also be lower and consequently it will be cost effective. Long acting methods like IUD is also effective for a country like Bangladesh. The increased use of male sterilization has significant effect on the achievement of replacement fertility because relatively lower CPR world be required to meet the goal. A common reason is that why couples do not use family planning services even when they need them, or are not using the method best suited to them, is unsatisfactory quality of services. Discontinuation is the highest for condom users with only third clients continue up to one year, discontinuation for IUD users would be more crucial to achieve demographic target. Men are supportive to FP but less willing to take the responsibility of using contraceptive methods. Only 4.8% of men are using male methods, 4.3% are using condom and less than 1% are using vasectomy. Husband-wife communication is an important determinant of contraceptive use. This attitudinal change can be considered while designing and implementing family planning program in future. Although fertility in Bangladesh has been declining, it is not, however, enough to reduce population growth. So, delay in age at marriage, increasing the age at first birth, spacing of births and widely dispersed newly born births may reduce population momentum. Therefore, accessibility of contraceptives is crucial to this newly married couples and adolescents to hasten the demographic transition. Program should also ensure uninterrupted contraceptive supply to them and it should emphasize in the program.

080 Anwar I; Sami M; Akhtar N; Chowdhury ME; Salma U; Rahman M; Koblinsky M. Inequity in maternal health-care services: evidence from home-based skilled-birth-attendant programs in Bangladesh. *Bulletin of the World Health Organization.* 2008; 86: 252-259.

The study aimed was **t**o explore use-inequity in maternal health-care services in home-based skilled-birth-attendant (SBA) program areas in Bangladesh. Data from a community survey, conducted from February to May 2006, were analyzed to examine inequities in use of SBAs,

caesarean sections for deliveries and postnatal care services according to key socioeconomic factors. The study findings found that out of 2164 deliveries, 35% had an SBA, 22.8% were in health facilities and 10.8% were by caesarean section. Rates of uptake of antenatal and postnatal care were 93% and 28%, respectively. There were substantial use-inequities in maternal health by asset quintiles, distance and area of residence, and education of both the woman and her husband. However, not all inequities were the same. After adjusting for other determinants, the differences in the use of maternal health-care services for poor and rich people remained substantial [adjusted odds ration (OR) 2.51 (95% confidence interval, Cl: 1.68-3.76) for skilled attendance; OR 2.58 (95% Cl: 1.28-5.19) for use of caesarean sections and OR 1.53 (95% Cl: 1.05-2.25) for use of postnatal care services]. Complications during pregnancy influenced use of SBAs, caesarean-section delivery and postnatal care services. The number of antenatal care visits was a significant predictor for use of SBAs and postnatal care, but not for caesarean sections. So, use of maternity care services was higher in the study areas than national averages, but a tremendous use-inequity persists. Interventions to overcome financial barriers are recommended to address inequity in maternal health. A greater focus is needed on the implementation and evaluation of maternal-health interventions for poor people.

081 Bhuiyan MSA; Begum J; Akhter S; Alam MS. Effectiveness of entertainment education to promote safe motherhood- Bangladesh. *JOPSOM*. 2008; 27(1): 39-49.

The study was undertaken to confirm plan, implement, and evaluate an entertainment education program to assess the effectiveness of entertainment education to promote safe motherhood-Bangladesh. It was carried out in six divisions under the city corporation. Wards of different districts, upazillas and union level were the study area. The study was conducted during September 2007 to February 2008. It was a quasi-experimental of pre-tested and post-test interventional study. A total number of 1890 married women and men aged between 15-49 years were selected as respondent. They were interviewed by using a pre-tested semi-structured questionnaire for collecting data. The findings showed that respondents' knowledge on slogans of safe motherhood increased to 91.6% after intervention which was 32.8% before intervention. Knowledge regarding slogans found no relationship with media ownership, which indicates intervention increases the knowledge. Post intervention knowledge (89.9%) on safe age of marriage was significantly higher than pre intervention (58.8%) ($p<0.001$). After intervention all the respondents can answer the danger signs, which was only 37% before intervention ($p<0.001$). Regarding respondents' preference of sources to get Information about safe motherhood, before intervention 80.7% preference of sources to get Information about safe motherhood, before intervention 80.7% preferred "doctor/health worker" 79.8% "Television" after intervention 70.6% preferred "doctor/health worker", 55.5% "radio" and 97.5% respondents preferred "television". Regarding liking of entertainment education programs, 31% said they liked it, and 68.9% said, did not like it. After intervention the liking was significantly higher the pre-intervention (95.5%) than ($p<.05$). Before intervention, only 46.5% respondents discussed about entertainment-education program with others, after intervention 65.5% respondents, 82.4% mentioned "drama" & 40.3% mentioned "cinema". After intervention their choice has changed, 99.2% respondents said that they want health Information through "drama". Most of the entertainment-education approach is acceptable to respondents. They want health Information through TV, radio, drama, music, advertisement, talk show/magazine program and cinema. Large scale study is needed with appropriate design to find out the effectiveness of entertainment education.

082 Chowdhury S. Menstrual problems of women in Bangladesh. Dhaka: BRAC University, James P Grant School of Public Health, 2008. (Monograph series; no. 5)

The aim of this literature review is to learn about local terminologies used to describe menstrual problems, to understand the practices and restriction surrounding menstruation during adolescence to learn about concept surrounding in fertility and its causes, to look at menstrual problems which result from use of contraceptives and to examine patterns of health seeking behavior of Bangladeshi women to treat their menstrual illness. The literature review was carried out by obtaining information from published reports, books and articles collected from local NGOs. Some information was also gathered from interviews with staff from local NGOs and gynecologist from Bangladesh Railway Hospital. The review found that notions surrounding menstrual blood include perceptions that it is polluted and women should not serve food during their condition on touch anyone with an eye or skin infection as it may worsen their illness, During adolescence, girls are taught about the various restrictions during menstruation such as not going outside and staying away from certain foods such as fish, eggs, meat, sour fruits. Menstrual problems as side effects of contraceptives may be tolerated in exchange for having an effective means of birth control. Expensive procedures such as D&C may be used to remove perceived fat in the uterus, which is often paid from loans; recently, on menstrual problem in Bangladesh, some study findings indicated as these problems cause ill health, subject women to social stigma and disrupt them from carrying out at daily activities. From the said findings, it may be recommended that in-depth research needs to be carried out to measure the magnitude and prevalence of menstrual problems, ways to clarify the misconception surrounding menstruation need to be explored, and information an side effects of contraceptives and the range of outputs available need to be given out to women before they adopt a contraceptive method.

083 Collin SM; Anwar I; Ronsmans CA. A Decade of inequality in maternity care: antenatal care, professional attendance at delivery, and caesarean section in Bangladesh (1991-2004). ***International Journal of Equity in Health.*** **2007; 6(9):1-24.**

This paper was attempted to answer this question by examining trends in three key maternal health indicators; antenatal care, delivery attended by a health professional (doctor, nurse, or midwife), and delivery by caesarean section. The authors used data from four Demographic and Health Surveys conducted between 1993 and 2004 to examine trends in the proportions of live births preceded by antenatal consultation, attended by a health professional, and delivered by caesarean section, according to key socio-demographic characteristics. The results found from the review that utilization of antenatal care increased substantially, from 24% in 1991 to 60% in 2004. Despite a relatively greater increase in rural than urban areas, utilization remained much lower among the poorest rural women without formal education (18%) compared with the 3 richest urban women with secondary or higher education (99%). Professional attendance at delivery increased by 50% (from 9% to 14%, more rapidly in rural than urban areas), and caesarean sections trebled (from 2% to 6%), but these indicators remained low even by developing country standards. Within these trends there were huge inequalities; 86% of live births among the richest urban women with secondary or higher education were attended by a health professional, and 35% were delivered by caesarean section, compared with 2% and 0.1% respectively of live births among the poorest rural women without formal education. The trend in professional attendance was entirely confounded by socioeconomic and demographic changes, but education of the women and her husband remained important determinants of utilization of obstetric services. Despite commendable progress in improving uptake of antenatal care, and in equipping health facilities to provide emergency obstetric care, the very low utilization of these facilities, especially

by poor women, is a major impediment to meeting MDG-5 in Bangladesh. Therefore, in striving to achieve national average targets such as MDGs, the reduction of socioeconomic inequalities in maternal health should be viewed as a rental policy and program goal. Moreover, barriers to health care access are well known, and a greater focus is now needed on implementing and evaluating interventions that benefit the poor, particularly in rural areas.

084 D'Costa SM; Low S. Unwanted pregnancy. In: Mona graph series; no. 9, Aug 2008/ed by Sjaak van der Gust et al. Dhaka: BRAC University, James P. Grant School of Public Health, 2008.

The Study was initiated to explore the perceptions and practices related to unwanted pregnancies. Preliminary a body mapping exercise was done in a focus group to stimulate discussion. There were in total two focus groups with four to six women in each group. The age range were from 19-20 and 24-30 years. In depth interviews with an experienced Dai, and a woman who had a spontaneous abortion during her fifth month of pregnancy were carried out. Keeping in mind the sensitive nature of the topic, all session were conducted in setting that offered as much privacy as possible. In the time of looking for unwanted pregnancy in this chapor, it was attempted to explore two issues. First, the causes and motives surrounding unwanted pregnancy and abortion and second, that influence the decision making process resulting in the termination of an unwanted pregnancy. The study findings revealed and found that husbands and family members play a significant role in the decision to continue or terminate a pregnancy and are usually pivotal in the selection of a provider. Most women mentioned common knowledge (regarding availability, accessibility and acceptability of service providers) previous experience or prior knowledge as well as the assurance of confidentiality as the main reasons to select a service provider. In Bangladesh abortion is illegal. However, the government has made family planning methods and MR available to curb the consequences of unwanted pregnancies. Drawing parallels in this study, it can be assumed that it could be the same in Bangladesh. Legislation of abortion may not lead to social acceptance and may not adequately address the issues of unsafe abortion. Thu the prevention of unwanted pregnancies may not be enough, and a complementary health care services, facilities for safe abortion, e.g. provision of MR and follow up services, training of health providers, post abortion counseling and confidentiality, need to be accessible to women (Bhuiya et al. 2001). Finally it is evident that a member of women turn to informal service providers due to lack of support from husbands or due to their perceived need to maintain confidentiality e.g. pre or extra marital relationships, social acceptance issues etc. Currently MR services require the husband's consent. There was a lot of apprehension about receiving enough data as we were unsure about the community's response to this subject.

085 Gazi R; Oliveras E; Saha NC; Kabir H; Jahan M; Sultana H; Rahman E. Demand-based Reproductive Health Commodity Project: end-line survey report. Dhaka: ICDDR, B, 2009.

The overall goal of the project is to improve the quality and delivery of health services, particularly RH, appropriate to the needs of the poor, in particular women and children, and to increase their access to those services. Data collected by ICDDR, B under this project are to provide evidence relating to the impact of these modifications on RH indicators. The findings can be used for developing appropriate strategies for improved RH service-delivery that are demand-based, effective, and replicable in the national program. ICDDR, B has conducted the baseline survey in the two rural project sites and one urban slum area namely Nabiganj upazila under Sylhet division, consisting of 13 unions (based on the enumeration, the total population is

323,357); Raipur upazila under Chittagong division, consisting of 11 unions (total population 260,983) and Dhaka city slum areas, consisting of ward 24, 25, 26 and 47 (total 141,912). The study results showed that the overall educational attainment of the married female respondents was low in all the areas, irrespective of two surveys. Above 48% (baseline) to 47% (end-line) of the respondents in Nabiganj and 48-45% in Dhaka had no formal education compared to 30-33% in Raipur. The proportion of women who completed secondary education or higher was the lowest (2.8-2.7%) in Nabiganj and the highest (5.6-6.5% in Raipur. In the rural areas, a higher proportion of the women in end-line compared to baseline obtained contraceptive methods from the public sector; in Raipur, it increased 37-50% while in Nabiganj, it increased 41-50%. In the rural areas, the Family Welfare Centre (FWC) was a common source for contraceptive methods in the urban areas, more women in end-line compared to baseline obtained contraceptives from the NGO clinics. The male respondents were asked if they had heard about any maternal conditions during pregnancy, during delivery, or after delivery that might be potentially life-threatening for woman. However, in end-line, higher proportions of the men compared to baseline knew in all the areas about injectables or condoms as contraceptive methods. Similarly, higher proportions of the men in end-line compared to the baseline knew about male or female sterilization in all the areas. Irrespective of the study sites, higher proportions of adolescents in end-line compared to baseline believed that using a HIV infected needle or syringe would cause HIV transmission. Similarly, higher proportions of the adolescents in end-line compared to baseline believed that receiving blood from an HIV-infected person might transmit HIV infection. Irrespective of the study areas and timing of the survey of the adolescents (64-84%) reported that television would be the most appropriate media for them to receive information on HIV/AIDS. In baseline, self-treatment was the most common reported treatment for those who had experienced an STI problem. In general, 73-96% of adolescents were aware of a health facility in their locality. Higher proportions of the urban adolescents in end-line compared to baseline knew about the NGO satellite on static clinic. In two rural areas, higher proportions of the adolescents in end-line compared to baseline knew about the government satellite clinics in their locality.

086 Giasuddin ASM; Mazhar I; Haq AMM. Prevalence of anticardiolipin antibody in Bangladeshi patients with recurrent pregnancy loss. *BMRC Bulletin.* 2010 April; 36(1): 10-13.

The objective of the present study was to see the prevalence of anticardiolipin antibody (ACA) in Bangladeshi patients (35) with recurrent pregnancy loss. Thirty seven women with normal pregnancy were included as control. Serum levels (mean ±SD) of ACA (u/ml) was significantly higher, whereas ANA (Ab-index) and anti-dsDNA (Ab-index) were similar in cases compared to controls (Cases vs Controls ACA: 31.8 ± 24.3 vs 10.5± 3.4, $p<0.001$; ANA: 1.07 ± 0.34 vs. 0.92 ± 0.15, $p>0.5$; A-dsDNA; 0.53±0.16 vs. 0.52 ± 0.18, $p>0.5$). The cases positive for ACA, ANA and anti-dsDNA were 37.1% ($p<0.001$), 20% ($p>0.05$) and 2.8% ($p>0.1$) respectively. Among the sero-positive cases 4/35 (11.4%) and 4/13 (30.8%) were positive for both ACA and ANA. In controls only 2/37 (5.4%) and 3/37 (5.4%) were positive for ACA and ANA respectively and none were positive for both ACA and ANA together simultaneously. Significantly high proportion of cases had O+ blood group (23/35: 65.7%, 10/13: 76.9%) ($P<0.01$). The prevalence of ACA varies according to population being 37.1% (13/35) in our patients with recurrent pregnancy loss and 5.4% in controls.

087 Haider SJ; Ferdous S; Giash-uddin S; Alam H; Chowdhury SS. Examine quality of care initiatives to improve the access of reproductive health including family planning care for people living in poverty. Dhaka: NIPORT & READ, 2010.

The study was undertaken to assess the quality of care received by reproductive health and family planning clients who are the rich and poor and assess the client satisfaction and utilization of health and family planning services. This study used cross-sectional statistical design to obtain information from the primary, secondary and tertiary sources. Integrated approaches combining both quantitative and qualitative methods were adopted to conduct the study. Quantitative technique was applied through catchments area sample survey per selected (sample) service centers: FWC, UHC, MCWC, DH and MC. Qualitative methods, such as intensive interviews of the service providers, FGDs, facility observations, interviews of indoor and outdoor patients/clients were applied. The study results revealed that 82% mothers received ANC during their last pregnancy. Mean of frequency of ANC visits is 3 times by the mothers irrespective of different catchments of service facilities except in the catchments of medical college hospital where it is 4 visits on average. Highest proportion of ANC visits commenced in the FWCs (41%) followed by UHCs (14%) and MCs (12%). Home was the predominant place (81%) of deliveries experienced by the respondents. Performance of delivery between home and institution was varied by catchments of different service facilities and also by socio-economic status of the respondents. The study also fond more than one-third of the mothers (41%) received PNC after their last delivery. Majority of the respondents 33% (2-41%) received PNC at their residence. Exactly a quarter of the respondents (25%; 14-37) received post abortion care form private/NGO clinics. The contraceptive prevalence rate observed in the current study was 65%. About tow-third (70%: 57-76%) of the mothers were visited by field workers at their residence within last 3 months prior to the survey. Finally, the knowledge and skills of service providers and the institutional capacities of the service facilities (ensuring adequate logistics support) at various levels have to be further improved to render quality care with optimum levels of client coverage both at pre and post service stages.

088 Hashem R. Existing reproductive and sexual health intervention to young people in South Asia-Bangladesh Chapter in: Monograph series; no.7. Dhaka: BRAC University, James P. Grant School of Public Health, 2008.

The objective of the study was to review existing reproductive and sexual health intervention to young people in Bangladesh. The report primarily relies on literature review which includes: Journals, books and articles find in the field of Bangladesh reproductive and sexual health. The review also includes information which has been gathered through interviewing the concerned persons. The literature and journals that have been reviewed were published between the periods of 1990 to 2005. In a population council report those 40% urban males and 20% of rural ales are found to be having premarital sexual activity before the age of 19. Set in contrast, evidence about premarital sexual activity among female adolescent in little although a recent sty by health providers indicated that garment workers seemed to have enforced sexual activity outside marriage and cases of pregnancy alongside is regular menstruation for single female worker is not at all rare (ICDDR,B working paper; no.65,2005). Therefore it is important to address adolescent sexual and reproductive health and rights issues in Bangladesh, regardless of gender. The report indicated that intervention addressing the adolescent group began in 1980 in Bangladesh. Family planning association of Bangladesh (FPAB) started to address adolescent initially to impart education to there which further went to introduce sexual and reproductive health education in 1990. However, various NGOs such as BRAC (1995 present) Marie Stops Clinic Society (1998-

2005), ICDDR,B as well as CARE Bangladesh and NIPORT, Engender Health (2004-preset), BCCP (1998 to date) population council, Bangladesh and UNFPA (2000-2003), UNICEF and several other organization are operating specific interventions to address adolescent reproductive and sexual health and Bangladesh. In Bangladesh nine different types of interventions, namely, Adolescent Family Life Education Program (AFLE) clinical service, awareness program and information, counseling and support activities, advocacy, mass media programs, research and training services, are operated by various national and international NOGs as per our research. The report outlines that there are more than twenty-five organizations currently working with specific interventions to address adolescent SRHR in Bangladesh. Among them a total of ten organization are providing educational services through a school based program and AFLE, six are providing clinical services, eight are inverted in counseling and support activities, about ten are actively engaged in awareness and information dissemination activities through youth friendly centre, peer networks, leaflets, handouts and posters. However the review revealed that despite increasing initiatives to improve young peoples SRH, the country is lagging behind to meet the actual need. The number of interventions is too few for meeting ASRH needs and the interventions are not effectiveness enough to address the issue in the field.

089 Hena IA; Akter F; Rob U. Baseline report of strengthening adolescent reproductive health project 2008. Dhaka: Population Council, 2009.

The study was conducted to measure adolescents' knowledge of and attitudes toward reproductive health (RH) and their health service-seeking behavior in the intervention areas of Plan Bangladesh. The study followed both qualitative and quantitative methods to collect data on RH-related knowledge, attitudes, and practice from adolescents aged 13-16 years and also from parents, school teachers, and local leaders. Information was collected from the govt. and NGO health facilities. The service providers were interviewed. The findings revealed that the adolescents in general had limited knowledge of pubertal changes. The majority of the adolescents had no correct knowledge on human reproduction. Only 40% of the male adolescents were aware that once they can ejaculate, they are able to reproduce. Such knowledge was remarkable low among the female adolescents. It was observed that 85% of the male and 62% of the female adolescents were aware of family planning (FP) methods and most of then knew amount contraceptive pills, followed by condom and injections. Knowledge about risks of adolescent pregnancy was almost universal among the adolescents but 15% of the adolescents did not know how to prevent HIV/AIDS. There is a need for removing the prevailing misconceptions about transmission and prevention of HIV/AIDS. Knowledge on the maternal health issues was high among the adolescents but danger signs and risks relation to adolescents pregnancy were known to a small number of the adolescents. Strengthened program efforts are required. Sensitization of parents is needed to create an enabling environment for the adolescents to receive RH information and services.

090 Hossain MA; Khan MA; Ahmed HU; Hannan FH. Assessment of access to and the coverage range of maternal child health and family planning services among poor women. Dhaka: NIPORT & Eusuf and Associates, 2010.

The major aim of the study was to examine access to and the coverage range of MCH-FP services among poor women. The researchers reviewed secondary documents, discussed with concerned professionals and academics, and conducted survey in all six divisions to collect primary data using semi-structured questionnaires from households, Pharmacists, TBAs, Nurses and FWAs. The study findings revealed that the access to safe drinking water (tube well) in the study area was quite high (89% household has access to tube well. 93% in rural households and 83% in urban

households). Only 6% urban households have access to running water (water supply system). Access to sanitation was poor- only 38% household use hygienic latrines. Survey noted that 265% households were indebted and generally the households have no year round food security. Antenatal care seeking behaviors of poor mothers were high as 82% women received antenatal check up during the last pregnancy- 87% rural and 80% urban mothers. Six out of every ten mothers had their antenatal check up from public hospitals/satellite clinic. Around 9% mothers had antenatal check up from untrained birth attendants (Dais) and 8% from trained birth attendants. Large majority (78%) of the deliveries took place at mother's own home – 10% mothers had their deliveries either in the public hospitals/clinics or in private clinics/hospitals and NGO clinics. The study found that satisfactory level of knowledge about family planning among the mothers. It was observed that all mothers knew al least on modern method of family planning and 89% mothers consider that female partners should adopt permanent family planning. Status of birth registration is not satisfactory – only about 50% mothers reported that births of their children were registered. The study also found that only 7% children are exclusively breastfeed and exclusively breastfeeding stop too early in 32% of infants. The data indicated that 86% children received vaccination and 86% received vitamin A capsule. Regarding the mothers' knowledge on health, 88% mothers know risks of complications during and after pregnancy, 30% know possibility of prolonged labor, 27% know about convulsion, 30% know possibility of bleeding during pregnancy, 20% know about severe headache and blurring of vision. The study also found that 80% adolescent girls had knowledge on menstrual hygiene. The study revealed that 68% adolescent girls had knowledge of family planning and around 35% girls received information on FP from FPA. It was found that 44% FWA reported that 60% to 80% couples had accepted FP methods. However, 14% FWA reported that less than 40% eligible couples had accepted FP methods. All health and family planning programs and services should be well targeted especially focusing poor women to ensure their access to the available health and family planning services to ensure social equality, effective population planning and management, and developing a healthy nation with all citizen of Bangladesh.

091 Ibrahim M; Debnath BC; Arslan I; Saha D. Effect of lead in postmenopausal hypertensive women in Dhaka city. *JAFMC Bangladesh*. 2007 June; 3(1): 17-22.

The objective of this study was to determine the association of lead with hypertension in Bangladesh, so that due attention may be attracted to keep this preventable factor in mind when the probable associated factor for hypertension is searched for. This case control study was carried out in the department of Biochemistry of Bangabandhu Sheik Mujib Medical University (BSMMU), Shahabag, Dhaka from January 2003 to December 2004. Out of 60 post menopausal women with hypertension, 30 (Group-I, controls) were residing in an area without potential source of lead pollution (B'Baria) & in group-II (cases) 30 women were residing in an area with potential source of bed pollution in air, for long duration (Dhaka). Values were presented as mean $\pm$ standard deviation. Ninety-five percent confidence limit was taken as level of significance. The study results indicated that median whole blood lead value of controls and cases were 14.75 lg/dl and 41.00 μg/dl respectively. There was significant difference ($p<0.001$) of blood lead between cases and controls. There was significant positive co relation of blood lead with serum creatinine and uric acid levels in cases. Significant positive correlation of blood lead was seen with duration of hypertension in cases but not in controls. There was also significant positive correlation of blood lead with duration of lead exposure in cases. Therefore the prolonged lead exposure may play a significant role in pathogenesis of hypertension. It is also interesting to observe that S Lead level correlate positively with serum creatinine and serum uric acid and negatively with Hb lead. Thus whole blood lead level should be an important biochemical laboratory parameter in

assessing hypertensive persons, including post menopausal women, particularly if they were residing in areas with potential lead exposure for a long period. But for conclusive evaluation further study should be carried out with large sample size and with more laboratory parameters like measurement of body lead burden (bone lead concentration), estimation of few erythrocyte protoporiphyrin or Zinc protoporiphyrin, estimation of urinary lead concentration etc.

092 Islam A. A More holistic approach to women's health issues. In: Bangladesh health system in transition: Selected articles. Dhaka: BRAC University, James P. Grant School of Public Health, 2009. (Monograph series; no. 11)

Bangladesh has made significant gains in many areas of health and social development since independence. The life expectancy of Bangladesh's is not only increased from 45 years at the time of independence to 65 years by 2005. The male-female disparity in this respect also disappeared. Infant mortality rate declines from 153 per 1,000 per 1,000 live birth to 52% per 1000, live births by 2006. So in the case with under mortality rate it declined from over 1000 per 1000 live births during the 1970s to 65 per 1,000 live births by 2007. Also we don't even seem to agree on the precise nameless of pregnant women dying during pregnancy or child birth. In order to achieve the relevant MDG, our maternal mortality ration must be reduced to 120 within the next seven year. A challenging task indeed, especially if the figure is closer to what UNICEF wants us to believe. Bangladesh has good infrastructure for maternal and child health. Across rural Bangladesh, there are more than 3,600 health and FWC, more than 400 thana/Upazila health complexes, 64 district hospitals, 14 government medical colleges hospitals, 10 post graduate institutes/hospitals and 20 specialized hospitals. In addition to there are 64 MCH at the district level covering a population of one or two million to provide health services to woman and children, including assisted delivery and emergency obstetric care. These are all part of the publicly funded health system. In other words, in dealing with women's health, our health system adopts a parochial gender perspective treating women primarily as tools for reproduction. How to make pregnancy and motherhood safer therefore, is the rallying cry of the health system. This kind of clinical approach will surely help same the lives of some pregnant women; however it will not put a serious don't or the number of new cases of pregnant women requiring such clinical intervention clinical invertors. In short such a clinical approach alone is unlikely to empower women health in the long season: Family planning program is still primarily aimed at increasing comparative use and reducing the total fertility rate and thereby, the population growth rate. It is not, unfortunately, predicted on prating and prating the health of women and the newborn. Bangladesh an hardly make programs in improving women's health and thereby, substantially reducing the maternal mortality ration often regarded as the life was test of other efficacy and efficiency of a health system a whole.

093 Islam N; Bhuiyan RH; Sattar MMA; Rashid MA; Shamsuddoha M; Latif KA; Kabir-uddin S. Integration of reproductive health services for men in Union Health anf Family Welfare Centers. Dhaka: NIPORT, Centre of Excellence & ARTCOP, 2010.

The main objective of the activity was to find out ways and means to provide appropriate services and interventions to increase the access of reproductive health services for men at UHFWCs. In this study data were collected from four categories of respondents namely; i) service provider, ii) field workers, iii) male and female reproductive age and iv) exit clients. In-depth interviews was conducted for data collection by using semi-structured questionnaire, checklist and guidelines. It was primarily targeted young and adult males and their partners in the communities where the 100 selected UHFWCs were located to conduct the baseline survey. A total six focus group

discussions were conducted to collect information on community perceptions about health centers, reasons for not seeking treatment from UHFWCs. The study findings showed that significant progress was made there are still a substantial percentage of men and women who are not using any contraceptive method. Only 30 percent of ever-married women and 50 percent of currently married men were aware of AIDS. In most cases men do not avail the service provided by the government health facilities like UHFWCs and UHCs. Even for general health care, majority of them do not seek services from trained service providers. The data further indicated that men have substantial reproductive health needs that have not been addressed in the context of the government health care delivery system in Bangladesh. Access to and use of contraceptives is two such needs. The study also revealed that a satisfactory level of communication between husband and wife on their reproductive goal and acceptance of contraceptive. This is evident from the fact that 93.3% of the males and 91% of the females advocate for discussions with their wives about their family size. More than 96% of the males find it obligatory to shoulder the responsibility of their wives when they are pregnant. Current use of contraceptive methods was almost universal (97.3%). A little more than 58% of the exit clients were reported be users of pill, followed by injection (18.8%). Only about 20% of the exit clients knew about RTI/STI, signs and symptoms of these diseases and their consequences. The study suggested that literacy rate should be increased. Field workers' training on RTI/STI/HIV/AIDS should be required. Supply of BCC materials should be increased. Counseling system of UHFWC should be strengthened and finally health education program should be strengthened..

094 Islam-uddin M; Islam MM. Sex preference and reproductive behavior in Bangladesh. *South Asian Journal of Population and Health*. 2008 June; 1(2): 149-160.

The study was initiated to examine the levels and patterns of sex preference in Bangladesh by using sex composition of living children and desire for more children. The data for the study comes from the 2004 Bangladesh Demographic and Health Survey (BDHS). The results indicate that for most Bangladeshi women, the ideal family consists of two children -one boy and one girl - with a balance sex composition. Nearly two-thirds (64.7%) of the respondents reported their ideal family size as 2, of which 63 percent said 1 son and 1 daughter as their preferred sex composition. However, as the ideal family size increases, the proportion of women desiring son than daughter also increases, indicating an overall son preference in Bangladesh. The average number of sons among those women who do not want next child is significantly greater than the same among women who want next child. Women's age, education, mass media exposure and region of residence appeared as the significant determinants for sex preference. For a particular parity, the contraceptive prevalence rate increases with the increase in the number of living sons irrespective of the number of living daughters. Among the currently married women with three living children, contraceptive prevalence rate is higher among those who have 2 sons or all the three are sons indicating that many women in Bangladesh want to ensure that they have had not only two or more sons, but also at least one daughter. Observed modern contraceptive use rate is found to be 19 percent less than the expected rate in absence of sex preference. If sex preference is eliminated, total fertility rate is estimated to decline by seven percent. However, the observed fertility level, which is 3.0 children per women, is still higher than the desired number of children. For further reduction in fertility and to achieve the replacement level of fertility, strong policy measures are needed to weaken the son preference among the couples.

095 Jashim-uddin M; Choudhury AM. Menstrual practices and reproductive health problems among adolescent girls in rural Bangladesh *South Asian Journal of Population and Health*. 2008 June; 1(2): 201-210.

The study aim was to examine the issues related to menstrual practices among rural Bangladeshi adolescent girls and to assess the association of menstrual practices with complications and reproductive health morbidity. This was a community based, cross sectional and descriptive study with combination of both quantitative and qualitative data collection techniques, both bivariate and multivariate analyses were conducted to assess the association of practice during menstruation and self-reported morbidity from STDs. The study findings revealed that forty-two percent of girls interviewed practiced harmful measures during menstruation. Only one fifth of the girls knew of any symptoms of STDs and 22% of them reported some symptoms. Findings from qualitative data showed that the girls were mainly using old cloths, and the most of them were reusing the same during subsequent periods. All kinds of old, ragged and rejected cloths are kept by girls for this purpose. Although not statistically significant, the study found a relationship between harmful practices during menstruation and self reported morbidity from STDs among adolescent girls. The paper makes a case that ignorance, false perception and harmful practices during menstruation prevail in rural Bangladesh and have implications for adolescent reproductive health. Further, the study demonstrates that among the determinants for reproductive morbidity, practices during menstruation appear to be the dominant factor. These findings reinforce the need to bring them out of traditional beliefs, misconceptions and encourage safe and hyena practices.

096 Khan TI; Naher L; Akhtar S. Study on delivery and postpartum care among the adolescent mother in Bangladesh. Dhaka: NIPORT & BIRPERHT, 2009.

The study was carried out to examine the level of knowledge and attitude of delivery and postpartum care among the adolescent mother of Bangladesh and to identify the barriers to obtain pregnancy and postpartum care of adolescent mothers in Bangladesh. The study was a community based cross sectional survey and was carried out among the adolescent mothers in 6 divisions of Bangladesh. The eligible respondents were selected randomly and interviewed through structured questionnaire by well trained field interviewers. Data were collected from sixty unions of twelve upazillas under six districts of six administrative divisions of Bangladesh. From each of the selected upazila, more than 350 respondents (adolescent mothers) were interviewed. Thus, a total 4415 respondents were the sample size. More than sixty percent (63%) adolescent mothers were found as current user of contraceptive methods. Oral pill users were found highest (37.1%) and lowest was barrier method like condom (5.8%). Adolescent mothers could identify correctly the complications of delivery i.e. delayed labor (40.2%), obstructed labor (25.4%), convulsion/eclampsia (42.7%), retained placenta (34.8%) excessive bleeding (37.0%), problem due to foetal malposition (34.8%), perineal tear (22.6%). Around 87% adolescent mothers were found to know correctly about the duration of postpartum period and 66.1% were aware of the type and need of care of mother after delivery. The study suggests that, awareness program on benefits of proper marriage time, antenatal and post natal care and selecting delivery place should be enhancing. Continuing refreshment program especially on client's perception related to contraceptive methods for field workers should be organized. Addressing adverse pregnancy outcome all necessary equipment and health resources should be ensured in all health facilities offering maternal and health especially at grass root level.

097 Kippler M; Goessler W; Nermell B; Ekstrom EC; Lonnerdal B; Arifeen SE; Vahter M. Factors influencing intestinal cadmium take in pregnant Bangladeshi Women a prospective cohort study. *Environ. Res*: 5 (2009) dol: 10.1010.j: envres 2097.006.

The aim of this study was to evaluate how various nutritional factors influence the uptake of cadmium in women, particularly during pregnancy. The study was carried out in a rural area of Bangladesh, where malnutrition is prevalent and exposure to cd via food appears elevated. The uptake of cadmium was evaluated by associations between erythrocyte cd concentrations, a marker of ongoing cadmium exposure, and concentration of nutritional markers. Blood samples, collected in early pregnancy and 6 months postpartum, were analyzed by inductively coupled plasma was spectrometry (ICPMS). Ery cadmium varied considerably (range: 0.31-5.4 μg/kg) with a median of 1.1 μg/kf (approximately 0.5 μg/l in whole blood) in early pregnancy. Data on the women's personal characteristics were collected through different questionnaires in the MINIMat trial. Postpartum the women were asked about their smoking habits during pregnancy. The study results also showed that ery- cadmium was associated with erythrocyte manganese (ery mn; positively), plasma ferritin (p-ft: negatively), and erythrocyte ca (Ery- ca; negatively) in decreasing order, indicating common transporters for cadmium, Fe and Mn. There was no evidence of cadmium uptake via Zn transporters, but the association between Ery- cadmium and p-ft seemed to be dependent on adequate Zn status. On average, Ery- cadmium increased significantly by 0.2 μg/kg from early pregnancy to 6 months postpartum apparently due to up regulated diva metal transporter 1 (DMT1). In fine intestinal uptake of cadmium appears to be influenced either directly or indirectly by several micronutrients, in particular Fe, Mn and Zn. The negative association with ca may suggest that cadmium inhibits the transport of ca to blood. Therefore it is essential to measure cadmium concentrations in different food, particularly rice and vegetables and further monitor the cadmium exposure especially among malnourished women in childbearing age and related adverse health effects.

098 Koenig MA; Jamil K; Streatfield PK; Saha T; Al- Sabir A; Arifeen SE; Hill K; Haque Y. Maternal health and care seeking behavior in Bangladesh: findings from a national survey. *International Family Planning Perspectives*. 2007; 33(2): 75-82.

The study was carried out to present and overview of key findings from the 2001 Bangladesh Maternal Health Services and Maternal Mortality Survey (BMMS) of ever-married women aged 13-49. The BMMS was conducted in all six division of Bangladesh using a two stage sampling approach. Wards and Union served as the primary sampling units in urban and rural areas respectively. In the first stage, 808 primary sampling units were chosen, from which 1,616 secondary sampling clusters were systematically selected. All ever-married women aged 13-49 were eligible; a total of 104,323 households and 103,796 eligible women were interviewed representing a response rate of 97%. The survey collected data on the prevalence of obstetric complications, Women's knowledge of life-threatening complications, treatment seeking behavior and reason for delay in seeking medical care. Data collection period was from January to June 2001. The study results showed that Bangladeshi women report low but increasing use of antenatal care, as well as low rates of delivery in a health facility or with the assistance of a skilled provider. Although almost half of women reported having one or more complication during pregnancy that they perceived as life threatening, only one in three sought treatment from a qualified provider. More than three fourths of women with the time sensitive complications of convulsions of excessive bleeding either failed to seek any treatment or sought treatment from an unqualified provider. The principal reason cited for failing to seek care for life-threatening complications was concern over medical costs, and pronounced socio economic disparities were

found for maternal care seeking behavior in both urban and rural Bangladesh. In spite of this gap in access to skilled delivery and effective emergency obstetric care, some progress has been made in reducing maternal mortality levels. Improved obstetric care and declining levels of fertility and unwanted pregnancy may have played critical roles in addressing the maternal health care needs of Bangladeshi women. Therefore, more research on the decline in maternal mortality levels in Bangladesh and its underlying factors is clearly warranted.

099 Kozara KM. Reproductive health & behavior change communications: situational analysis existing interventions in Bangladesh. Dhaka: BRAC University, James P. Grant School of Public Health, 2008. (Monograph series; no.8)

This study aimed to review the extent of communications approaches to health education and reproductive health education, in particular. Another objective was to identify Bangladesh's high risk groups in relation to HIV/AIDS and sexually transmitted infections and assess what types of communications approaches are best suited for them. The primary sources of data, arguments and opinions were from interviews were conducted including: i) reproductive health NGOs, service providers and advocacy; and ii) Communications professionals from NGOs, television networks, Journals and radio broadcasting. Notes were taken from the interviews and repeat interviews were scheduled with certain individuals. Secondary research methods are consisted of: i) a review of archival material including audio/video archives, flipcharts, RH training arterials, Journal/print archives, leaflets, posters billboards/slogans; and ii) Site visits to witness slide show demonstration, group information sessions, mobile clinic units, and clinic based BCC training for CHV and TBAs. The study finding showed that a total of 1702 married and unmarried adolescents aged 13-19 years from six units of there Upazillas in Bangladesh were asked question regarding their knowledge reproductive health topics. A total of 1203 parents/guardians of the adolescent were given a separate, though comparable survey. Findings also showed that 85% of adolescents had heard of HIV/AIDS; however knowledge of modes of transmission and prevention were 60% and 68% respectively. Only 8% of surveying adolescents' demonstrated knowledge of sexually transmitted Infection. About 90% of parents/guardians support this inclusion of RH education in schools. Moreover, 75% of parents/guardians supported adolescents age 10-14. Supported adolescents ages 10-14 and 94% supported adolescent age 15-19 in receiving information on prevention of unwanted pregnancy. In firms of sexual activity and contraception, among 25% male and 30% female interviews, the mean age for first sexual experience was 14 years, Only 23% of adolescents used any form of birth control the first time they had sex, most commonly, oral contraceptives, condoms and injectables. Finally 10% of adolescents visited any health center for RH. In 2004, the survey showed that 81% of rural adolescents and 39% of rural adult Bangladeshis watch television regularly and likewise 68% of rural adolescents and 75% of rural adults listen to radio regularly. The future of this study would focus on a closer examination of crossroads/junction areas, where a high volume spread of HIV/AIDS and STDs/RTIs. The study suggested that BCC strategies utilizing modern technologies (such as cell phones, television and radio) are underutilized whereas strategies with smaller outreach (such as puppet shows, street theater and posters) are more commonly used communication methods, Finally upon addressing these factors, the study will make conclusion about the current state and future potential of health behavior change communication in Bangladesh.

100 Li Li; Ekstrom EC; Goessler W; Lonnerdal BO; Nermell B; Yunus M; Rahman A; Arifeen SE; Persson LA; Vahler M. National status has marginal influence on the metabolism of inorganic arsenic in pregnant Bangladeshi women. *Environmental Health Perspectives*. 2008 Mar; 116 (3): 315-321.

The study was carried out to elucidate the modifying effects of macronutrient status and as on methylation among women in Matlab, Bangladesh, where peoples are chronically exposed to ias via drinking water. The study considered the effects of macronutrient status using body mass index (BMI) among 442 women in early pregnancy (gestation week 8), and effects of micronutrient status (plasma folate, vitamin B12 zinc, ferritin, and selenium) among 753 women at gestational week 14. Arsenic metabolic urine was measured by HPLC combined with hydride generation inductively coupled plasma mass spectrometry. The study results found that the median concentration of as in urine was 97 µg/L (range 5-1, 216 µg/L, adjusted by specific gravity). The average proportions of iAs, mono-methylarsonic acid, and dimethylarsinic acid in urine in gestational week 8 were 15%, 11% and 74% respectively. Thus the women had efficient as methylarion in spite of being poorly nourished (one-third) had BMIs <18.5 kg/m2) and having elevated as exposure, both of which are known to decrease as methylation. The metabolism of iAs was only marginally influenced by micronutrient status, probably because women, especially in pregnancy and with low folate intake, have and efficient betaine-mediated remethylation of homo-cysteine, which is essential for an efficient as methylation. In conclusion, it may be told that in spite of the high as exposure and prevalent malnutrition, overall as methylation in women in early pregnancy was remarkably efficient. The as exposure level had the greatest impact on as methylation among the studied factors.

101 Mannan MA; Hakim JA; Waris ST; Ali A; Hakim AKMN. Creating the conditions for scaling up the integration of reproductive health services for men in health and family welfare centers in Bangladesh. Dhaka: USAID, ICMH, DGFP, FRONTIERS. 2008.

The main objective of the study was to examine the impacts of scaling up the integration of reproductive health for men. An-operations research (OR) study, supported by the population Council's Frontiers in Reproductive Health (FRONTIERS) program, had showed that reproductive health services for men could be feasibly and acceptably integrated within the Health and Family Welfare Centers (HFWC) in Bangladesh, which have been primarily women-centered health facilities. The scale-up activities were carried out in three phases. The first was a preparatory phase, consisting of a review and review and revision of the teaching and communication materials developed during the original OR project, which included incorporating the systematic screening instrument to identify clients' unmet needs during the registration process. In the second phase, the revised model was introduced into 40 HFWCs. To make people aware of the availability of RTI/STI services, 463 group meetings were conducted at the community level. The third phase entailed assessing the feasibility of scaling up this revised model through analysis of service statistics, exit interviews with clients, and observation of client-provider interactions. A total of 26 master trainers were trained and 110 service providers successfully completed the training on counseling and treating RTIs/STIs using the syndromic management approach. The results revealed significant improvements in the trainees' knowledge and competence in the management of RTI/STI clients. For example, the proportion of providers who knew how to treat urethral discharge nearly tripled following the training (increasing from 36% to 96%). The refresher training was vital for retaining providers' skills and clarifying their questions, and is strongly recommended for any scale-up process. Approximately 82 percent of adult clients (90% of the men and 79% of the women) visited the HFWCs for general health care.

More females received family planning and reproductive health services than males (10% versus 2%). During the scale-up period, service providers diagnosed and treated 1,862 RTI/STI clients, 14 percent of them men. Condom distribution gradually increased over time in areas where the condom supply was regular, but declined where the supply was irregular. The systematic screening instrument, a method developed by FRONTIERS to identify clients' unmet needs, was introduced during the scale-up. In nine percent of cases, systematic screening helped identify one or more unmet needs, most commonly general health care services, followed by RTI/STI treatment and family planning, in most cases, providers' were able to administer the additional services during the same visit. These findings suggest that this model of service delivery and training could be scaled up countrywide, preferably in stages. No major operational difficulties occurred during the expansion, although a substantial amount of time was initially spent on planning and working out programmatic details, especially those related to providing theoretical and practical training. It is advisable to hold clinical training in a facility where many RTI/STI cases are treated.

102 Moran AC; Winch PJ; Sultana N; Kalim N; Afzal KM; Koblinsky M; Arifeen SE; Seraji MHR; Mannan I; Darmstadt GL. Patterns of maternal care seeking behavior in rural Bangladesh. *Tropical Medicine and International Health.* 2007 July; 12(7): 823-832.

The objectives of the study were to examine the (i) definitions of care seeking for maternal health complications used by families in rural Bangladesh; (ii) the frequency and determinants of locali-defined care seeking practices; and (iii) implications of local definitions of care seeking for monitoring maternal health interventions and strategies to promote care seeking. The study conducted 24 semi-structured qualitative interviews with women who had recently given birth to characterize care seeking behaviors in response to perceived complications. Based on these findings, a quantitative household questionnaire was developed and administered to 1490 women, half of whom reported a serious or very serious complication during their last pregnancy and/or delivery (n=769;52%), and were included in the quantitative analysis. The study results found that informants described three care seeking patterns in qualitative interviews: (i) sending a family member to purchase treatment to administer in the home; (ii) sending for a provider to treat the woman in the home and (iii) taking the woman outside the home to a facility or provider's office. The quantitative survey revealed that most women sought care for 'serious' complications (86%), with 42% seeking multiple sources of care. The majority of women purchased a treatment to administer at home (68%), while 20% brought a provider to the home. Thirty percent of women were taken to a provider or facility. Considering the study results, there is a need to incorporate these recommendations into safe motherhood policies and programs to more accurately document care seeking for perceived complications in an effort to achieve MDG-5.

103 Mridha MK; Anwar I; Koblinsky M. Public-sector maternal health programs and services for rural Bangladesh. *J Health Popul Nut.* 2009 Apr; 27 (2): 124-138.

This work was undertaken to assess the development of maternal health services and policies by reviewing policy and strategy documents since the independence in 1971, with primary focus on rural areas where three-fourths of the total population of Bangladesh reside. For reviewing the evolution of maternal and health services with the national public-health system, the study reviewed the existing government policy and strategic documents, such as five yearly development plan (1973-2000); Maternal Health Strategy 2001;the PRSP 2004; HPSP 1998-2003; HNPSP 2003-2010; MIS of MOHFW was used for determining the availability of public-sector infrastructure, human resources, and services provided. Data generated from key-informant

interviews with government and non government officials were also helpful to understand the chronology of maternal health services in the country. The study findings showed that maternal healthcare services are delivered from for-profit and not-for-profit (NGO) sub sectors. The paper focused on maternal healthcare delivery by public sub sector. Maternal healthcare services in the public sector of Bangladesh have been guided by global policies (e.g. five-or three-yearly). The Ministry of Health and Family Welfare (MOHFW), through its two wings-Health services and family Planning-sets policies, develops implementation plans, and provides rural public-health services. Since 1971, the health infrastructure has developed though not in a uniform pattern and despite policy shifts over time. The Health Services wing of the MOHFW has ensured that all district-level public-health facilities, e.g. district hospitals and medical colleges, can provide comprehensive essential obstetric care (ECO) and have targeted to upgrade 132 of 407 rural Upazila Health Complexes to also provide such services. In 2001, they initiated a programmed to train the Government's community workers (Family Welfare Assistants and Female Health Assistants) to provide skilled bathing care in the home. However, these plans have been to meager, and their implementation is too weak to fulfill expectations in terms of the MDG 5 indicator-increased use of skilled birth attendants, institutional deliveries, and use of caesarean section remain low and are increasing only slowly. All these indicators are substantially lower for those in the lower for those in the lower three socioeconomic quintiles. A wide variation exists in the availability of comprehensive EOC facilities in the public sector among the six divisions of the country. Rajshahi division has more facilities than the WHO 1996 standard (1 comprehensive EOC for 500,000 people) whereas Chittagong and Sylhet divisions have only 64% of their need for comprehensive EOC facilities. Based on the WHO standard 2005, it is estimated that 9% of existing doctors and 40% of nurses/midwives were needed just for maternal healthcare in both comprehensive EOC and basic EOC facilities in 2007. While the inability to train and retain skilled Professionals in rural areas is the major problem in implementation, the bifurcation of the MOHFW (Health Services and Family Planning wings) has led to duplication in management and staff for service-delivery, inefficiencies as a result of these duplications, and difficulties of coordination at all levels. The Government of Bangladesh needs to functionally integrate the Health Services and Family Planning wings, move towards a facility-based approach to delivery, ensure access to key maternal health services for women in the lower socioeconomic quintiles, consider infrastructure development based on the estimation of facilities using the WHO 1996 recommendation, and undertake a human resource-development plan based on the WHO 2005 recommendation.

104 Nahar L; Alam, N; Ali KJ; Alam S. Reasons for not having required number of ANC visit in Bangladesh: final report. Dhaka: NIPORT & CDS, 2007.

The study attempted to identify the reasons for not having required number of ANC visits by women and its socio-cultural and programmatic determinants and to recommend ways to address those issues. Data was collected through a survey representing a cross-section of 727 women who gave live birth within past three years including currently pregnant women with no children, and exit interview of 236 pregnant women who come to seek ANC from different service providing facilities covering all administrative divisions. Focus group discussions (FGD) with husbands, mother-in-law and community skilled birth attendants (CSBA) have been used in the analysis. The study results revealed that ANC visits in ordinal months of pregnancy was apparent, but the knowledge on delivery planning was very low. About 60% of the women thought ANC visits to be made should be three or more, but 40% did not know what should be the required number of ANC visit. More than half of the respondents (56%) thought qualified private practitioners, followed by husband (42%), were the reliable source of information. FWAs and FWVs as some of

information were very low. FGDs revealed that the behaviors of ANC service providers are not friendly to the service seekers. The CSBAs have sufficient knowledge about the job thus do, but they yet to establish themselves as a dependable delivery care provider. However, both husbands and mothers did not seen to be major barriers as offer understood. As per findings of the study, it may be recommended that the behavior of ANC service providers and regularity of their attendance in the service providing facilities should be addressed. The overall environment of the service providing centers in terms of cleanliness, access to running water, electricity, condition of furniture and equipment requires attention. The proper contact of women in MCH program should be systematic and measurable. ANC service providers should be oriented on delivery planning and such activity should be integrated in the job description.

105 Naher L; Akhtar S. A Study on psycho-social health status of women toward the end of their reproductive years. Dhaka: BIRPERHT, 2010.

This study was conducted to find out the association between socio-cultural factors and wellbeing of women toward the end of their reproductive years and to determine the patterns of menopausal systems and post-menopausal health problems, and to assess the health care seeking behaviors. The study was designed on the basis of a cross sectional survey of socio-economic status, general health status, menopausal symptoms, psycho-social stress, family support and health care seeking behavior by urban poor women toward the end of their reproductive years. A total of 391 women were possible to interview during two months of data collection period in the slum areas of Nakal Para rail line basti, Biman quarter basti and Shiya mat bosti of Dhaka city. The results revealed that nearly 40% women experienced menopause before the usual age (45-55 years) of menopauses, 90% had menopause within 49 years of age. About 40% of the study women were widow, around 57.3% were currently married and 3.7% were separated. Among the respondent about 54% believes that menopause is a normal phenomenon, around 36% told that it occurs after cessation of reproductive live. Concerning knowledge about menopausal problems 56.5% respondents showed to have poor knowledge, 23.6% showed to have average knowledge and 16.8% showed to have good conception about menopause. In response to the anxiety scale, 15.3% showed minimal, 21.0% mild, 19.2% moderate and 44.5% showed severe anxiety. It is not actually the hormonal changes, but the psychological impact associated with this stage that causes the problems. Issues surrounding menopause are an important component of the life cycle approach to reproductive health. There is virtually no information on menopause, including its age distribution, socio-cultural significance, or the prevalence of accompanying problems. The implicit assumption in most health policy and planning throughout the world is that gender differences are only evident during the reproductive years of a women's life. On the other hand, health care providers also lack of knowledge of the needs and concerns of aging women. As a result their health needs remain underserved. Actually women suffer from many physical and psychological problems at pre and after menopause. Therefore, it may be suggested that awareness should be developed among the general people as well as women to seek health care for their menopausal and postmenopausal health problems.

106 Naher LAD; Begum N; Ferdousi S; Begum S; Ali T. Sympathetic nerve function status in postmenopausal women. *J Bangladesh Soc Physiol,* 2010 June; 5 (1): 40-45.

The objective of the study was to observe the sympathetic nerve function status in postmenopausal women and their relationships with serum estrogen level. This cross sectional study was carried out in the Department of Physiology, BSMMU Dhaka from 1st January to 31st December 2007. A total number of 60 apparently healthy subjects of whom 30 were post

menopausal women with age ranged from 45-60 years (group B) and 30 were pre-menopausal women with age ranged from 20-30 years (group A) were enrolled. Pre-menopausal women were studies during follicular phase of menstrual cycle. Tow simple autonomic never function tests, rise of diastolic blood pressure (DBP) during hand grip and fall of systolic blood pressure (SBP) on standing were done to assess sympathetic activity and serum estrogen level was measured in both the groups. Data were analyzed by unpaired test and person correlation coefficient test. The results revealed that mean resting SBP and DBP were significantly higher ($p<0.001$) in postmenopausal women than pre-menopausal women. The mean value of estrogen was significantly ($p>0.001$) lower in group B (post menopause) than those in group A (pre-menopause). Fall in systolic blood pressure after standing was significantly ($p<0.001$) lower in postmenopausal women than those in pre-menopausal women during their follicular phase of menstrual cycle. Again, rise in diastolic blood pressure after sustained handgrip and fall in systolic blood pressure after standing showed negative correlation ($p>0.05$) with estrogen level in the postmenopausal women which was statistically non significant. In addition, regression analysis nerve revealed significant association of sympathetic activity with estrogen level and also with age in postmenopausal women. From this study it can be concluded that sympathetic activity is higher in postmenopausal women who may be related to their lower estrogen level and old age as well.

107 Nahar P. Health seeking behavior of childless women in Bangladesh: an ethnographic exploration for the special issue on loss in child bearing. *Social Science and Medicine*. 2010; 71: 1780-1787.

This paper was written to deal with the health seeking behavior of childless rural poor and urban middle class women in Bangladesh. Data for this study were collected from a northern district of Bangladesh named Mymensing, using various qualitative methods including life histories, in-depth interviews, and key-informant interviews. The study showed that social class and the geographical location of the childless women determine their health seeking behavior. Local healers in the informal sector were found to be the most popular health service option among the rural childless women. The factors for utilizing them included low costs, the gender of the provider (with same-sex providers being preferred), having a shared explanatory model with the healers, and easy availability. Unlike their rural counterparts, urban childless women predominantly seek expensive Assisted Reproductive Technologies (ART) treatment which is available only in the formal sector, in private services. However, despite their affiliation with modern treatment, urban childless women still believe, like their rural counterparts, that the remedy for childlessness ultimately depends on God. As a result, in addition to biomedical treatment, many return to or simultaneously pursue various traditional, spiritual or folk treatments. It was found in this study that in Bangladesh, where fertility control is the main focus of health policy, childless women are excluded from mainstream discussions on women's health. Consequently the childless women have to suffer in various ways as a result of their health seeking behavior.

108 Naved RT; Persson LA. Factors associated with physical spousal abuse of women during pregnancy in Bangladesh. *International Family Planning Perspectives*. 2008; 34(2): 71-78.

The study was undertaken to investigate the factors associated with physical spousal about of women during pregnancy in Bangladesh. For conducting this study, a sample of 2,553 ever-pregnant women aged 15-49 from one urban and one rural site in Bangladesh were surveyed in

2001 as past of a World Health Organization multi country study. Multilevel logistic regression analysis was used to examine factors associated with physical spousal abuse of women during pregnancy. The study results indicated that urban and rural women whose mother or mother-in-law had experienced physical spousal abuse had increased odds of experiencing abuse during pregnancy (odds ration, 2.1-3.4); increased spousal communication was negatively associated with the outcome in both setting (0.6 and 0.7). Among urban women, being older than 19, having a husband with more than 10 years of education and being from certain higher income quintiles were negatively associated with abuse (0.2-0.5); living in a community high concerned about crime was positively associated with abuse (1.1). Among rural women, being able to depend on natal family support in a crisis was negatively associated with abuse (0.5); being in a marriage that involved dowry demands and being Muslim were positively associated with abuse (1.8 and 3.6, respectively), whereas perceived support form ones natal family in a crisis was negatively associated with such abuse (0.5). On the contrary to general expectation, living with ones in laws, earning at income and participating in a saving on credit program were not associated with abuse during pregnancy among urban or rural women. The message that a family history of spousal violence increased a daughter's risk of such abuse should be widely communicated. The study suggested that further research is needed to determine whether increased couple communication reduces the likelihood of violence or whether absence of violence leads to increased couple communication.

109 Oro EM; Chowdhury T. Personal hygiene of women. In: Monograph series; 9. Dhaka: BRAC University, James P. Grant School of Public Health, 2008.

This study aimed to explore the perception and practices of personal hygiene of women in the village kakabo. Data were collected from six women through observations, free listing of personal hygiene practices household mapping of resources and in depth interviews. Triangulation method was use3d to crosscheck the findings. Six married women aged from 18 to 45 years were selected to participate in the Participatory Rapid Appraisal (PRA) exercises and ethnographic interviews, personal hygiene is also related to social order for women, it is very important what people say. What people think and how society judges them. The women of kakabo perform retain hygiene practices, generally, brushing their teeth, taking a bath, washing their hands using soap (mostly after coming back from the toilet) and maintaining. It was noted though that actual practice may be different from what they said, for example, they may say they use soap after urination but in practice, they may not do so regularly. A number of factors motivate hygiene practices. For instance, hygiene practices strongly supported by religious beliefs are more likely to be maintained by various methods e.g. by taking a special bath after menstruation is over or right after sexual intercourse. This study was done only among Muslim women. These findings revealed that complement of these of anecdotal (1997) concerning sanitation emphasized by the three prolonged interventions of providing accessible safe water, appropriate and sanitary methods of excreta disposal and hygiene education. As repealed the finding, access to sanitation facilities like a toilet and tube wells in an important facilitating factor in the practice of personal hygiene. In this study it is found that health inputs through media, health education and medical advice helped in improving hygiene practices. The study recommended to health promoters (Govt. Non-govt. extra) to consider the perception and meanings attached to hygiene by the rural people when developing health mislays and frameworks and strategies on health education. The concept of workload affecting self care and personal hygiene also came out in this study. This as well as the safety issues musk by analyzed and will consider with promoting personal hygiene.

110 Parvin S; Lahiry S; Yasmin N; Faruque MH. Performance for delivery places among slum women of Dhaka. *SUBJPH*. 2009-2010; 2(2)-3(1):14-22.

The present study has been undertaken to assess the choice and place of delivery among the women from few selected urban slums that gave birth for at least once. Purposively selected 237 women from four urban slums of Mohammadpur, Dhanmondi and Rayer Bazaar were included in the study who were undergone a face to face interview for data collection. The study results showed that among all 212 (89.5%) women opted for home delivery. The younger women opted for low cost NGO clinics though 84% of them game birth at homely environment attended by unskilled birth attendants. Most of the time the ultimate decider regarding pregnancy places was found to be respondent's mother or father-in-low or husband. Normal vaginal delivery (NVD) accounted for 86% of the deliveries. The prevalence of LBW was 27.3% and that of premature baby was 5.6%. Prevalent infant mortality rate was 5.5% and under-5 mortality rate was 6.7% which is very high. Major determinants of the place of delivery of study subjects were socio economic status, social culture, wish of father or mother in law or husband, respondent's confidence or unskilled birth attendants, women's choice to be at home with relatives during their delivery, level of knowledge of the respondents and their familiars regarding pregnancy complications and lake of awareness in this regard. Families counseling and subsidized rate for clinical care for the poor both in the urban and rural areas can enhance in situational delivery practice.

111 Rah JH; Shamim AA; Arju UT; Labrique AB; Rashid M; Chriastian P. Age of onset, nutritional determinants, and seasonal variations in menarche in rural Bangladesh. *J Health Popul Nutr*. 2009 Dec; 27(6): 802-807.

The present analysis was conducted to determine the age at menarche using self-reported date of onset in a group of female adolescents aged 12-19 years in a rural area of Bangladesh and to examine its association with marital and nutritional status and season. The resulting sample included in the analysis comprised 3,923 (70.3%) married nulliparous and unmarried female adolescents aged 12-19 years. The result of the study revealed that at the time of assessment, most (88%) adolescents had attained menarche at the mean (standard deviation [SD] age of 12.8 (1.4) years. Age of onset of menarche among married adolescents (13%) occurred earlier than in those who were unmarried (12.6±1.3 years vs. 12.9±1.4 years, $P<0.01$). Age at menarche was negatively associated with MUAC after adjusting for age and marital status ($\beta=0.10$, $P<0.01$). More than 50% of the adolescents had an onset of menarche during winter ($X^2 =634.97$; $p>0.001$), with peaks in December and January. In this rural population, the current age at menarche was found to be slightly lower than the previous estimates of 13.0 years in Bangladesh. An early onset of menarche was associated with season and better nutritional status of the female adolescents and may be associated with early marriage. Thus, while continuing efforts should be made to improve the nutritional status of female adolescent, educational activities, advocacy, and strong policies need to be in place at the same time to help delay marriage and first childbirth among female adolescents in the developing world.

112 Saha AK; Shabuz MZR. Reproductive health problems of married adolescent women in rural Bangladesh. *South Asian Journal of Population and Health*. 2008 June; 1(2): 161-169.

The study was conducted to investigate the association of morbidity during antenatal, delivery and postnatal period with several socio-economic and demographic characteristics of married

adolescent women in the rural areas of Bangladesh on the basis of the data from Bangladesh Maternal Health Services and Maternal Mortality Survey (BMMS) of 2001. It has been observed that, pre-eclampsia is the major life threatening complication among married adolescent in the rural areas of Bangladesh during ante-partum and delivery period whereas excessive bleeding is the major complication during postpartum. Adolescent women who have a small family (suffered mostly from ante-partum, delivery and postpartum complications than that of women who have a large family (>5). Education has the greatest influence on postpartum complications. Respondents who have higher education were not found to suffer from any type of postpartum complications except excessive bleeding and edema. The logistic regression analysis shows that number of prior pregnancy has significant influence on ante-partum and delivery complications. Religion appeared as a significant predictor of complications during ante-partum period. Place of delivery and assistance during delivery appeared as significant predictor for complications during delivery period and watching television appeared as significant predictors during postpartum period. The study also revealed that respondents who were assisted by doctor during their delivery period more form delivery complications than their counterparts. This might be because of the fact that only conscious respondents go for a doctor during complications and they are usually educated and financially sound. Therefore, awareness must be created through the public media as well as through the community leaders so that age at first marriage for female does not come below the legal age (i.e. 18 years). Family members should also guide and help the adolescent women to make marriage and fertility decision.

113 Sania A; Chara LD. Menstrual care of adolescents girls. In: Monograph series; no. 9. Dhaka: BRAC University, James P. Grant School of Public Health, 2008.

The aim of this article was to examine to the menstrual care of adolescent girls in the village. Qualitative techniques such as individual ethnographic interviews, focus group discussions, case studies and PRA tools, such as body mapping, were used for data collection. The respondents of the study were seventeen adolescent girls and four mothers from Muslim and Hindu families. The study found that young girls were not prepared for their menarche. They were frightened, embossed and disturbed due to their ignorance of this natural process. Sexuality, fertility and pollution are strongly associated with menstruation, which makes menstruation a shameful and hidden subject. Even after reaching menarche, young girls get little information about the physiological changes taking place and the required hygiene practices, Irrespective of religion girls take special care to maintain personal hygiene in terms of cleanliness of their body as well as the absorbent clothes and the disposal of the clothes. They assume those things will affect their fertility. As long as menstrual problems do not dead to irregular/missing menstrual cycles and infertility after marriage, they co not seek health care. The common nation is that the menstrual problems and infertility should be dealt with by traditional health and not by biomedical practitioners. Most of norms practiced in the village restrict girl's movements and food intake. Restricted foods during menstruation include foods, sour foods and sweets as there are thought to affect menstruation in various ways. Girls like to practice certain norms like not doing household chores Girls from both religious group in the village talked about gender disparities in their families and the community Girls are not allowed to go to school to avoid the embarrassment of blood stains that may be visible to others, especially boys. Hindu girls do not perform puja, do not go to kitchen and do no go to temples. Muslim girls are not allowed to touch `Quaran' during the menstrual period, Study also showed that socio cultural norms and traditions cause withdrawal of adolescent girls from school after menarche and restrict their exposure to the outside world. In addition poverty and gender disparity cause ignorance and poor health for girls during this crucial period of their life. In conclusion, cultural silence around menstruation keeps the girls unaware of

biological process before menarche. Lack of awareness and communication between mothers and daughters puts the girls at risk. Orientation to proactive groups of adolescent girls or topics like menstruation can be an entry print activity to educate them about their reproductive health.

114 Sibley LM; Hruschka D; Kalim N; Khan J; Paul M; Edmonds JK; Koblinsky MA. Cultural theories of postpartum bleeding in Matlab, Bangladesh: implications for community health intervention. *J Health. Popul Nutr* 2009; 27(3): 379-390.

The overall aim of the study was to improve the understanding of recognition of and response to PPH and to use this understanding for informing health communications, provider-training, and future research. This study identified cultural theories of postpartum bleeding that may lead to inappropriate recognition and delayed care-seeking. Qualitative and quantitative data obtained through structured interviews with 149 participants living in Matlab, Bangladesh, including women aged 18-49 years, women aged 50+ years. Traditional birth attendants (TBAs), and skilled birth attendants (SBAs), were subjected to cultural domain. General consensus existed among the TBAs and lay women regarding signs, causes, and treatments of postpartum bleeding (eigenvalue ratio 5.9, mean competence 0.59, and standard deviation 0.15). Excessive bleeding appeared to be distinguished by flow characteristics, not color or quantity. Yet, the TBAs and lay women differed significantly from the SBAs in beliefs about normalcy of blood loss, casual role of the retained placenta and malevolent spirits, and care practices critical to survival. Cultural domain analysis captures variation in theories with specificity and representative-ness necessary to inform community health intervention. In conclusion, the approach to cultural domain analysis used in this study permits a level of local specificity and representative ness that, it believe, are necessary to adequate inform the development of community health interventions. The approach can be corroborated through behavioral studies.

115 Sultana N; Wazed F; Begum N. Abdominal pregnancy: a rare presentation of ectopic pregnancy. *The ORION Medical Journal*. 2010 Jan; 33(1): 735-736.

The case report was done of an abdominal pregnancy, which was a non booked case, identified at about 28 weeks of gestation. Abdominal pregnancy was described recent of 6 weeks and advanced weeks near term. A case of abdominal pregnancy with dead fetus of about 28 week's pregnancy is described here. A women of 25 years old, gravida 3rd para 2+0 (forts one still birth by caesarean section & second one normal term delivery at home, age of last child 4 years) was admitted into an urban primary health care centre (maternity) with 7 mothers pregnancy (LMP could not be mentioned), sudden severe pain and moderate per-vaginal bleeding 13 days back and less of foetal moment for 13 days. She had no antenatal check up also. It revealed that uterus was 4.7X10 c.m. bulky; there was mild collection of fluid within the uterus. There was a cystic area with a fetus and placenta within the abdominal cavity in left lumber region. BPD-5 cm, F1-5.1 cm, Sex-female, Wt-600kg & placenta were attached with urinary bladder. Advanced abdominal pregnancy is associated with high maternal mortality (0-20%) and prenatal mortality (40-95%). Close monitoring with modern techniques result in a 70-80% increase in the survival of fetus older than 30 weeks. Though very rare, delivery of a term living abdominal pregnancy has been reported. More than 90% of the survivors have serious malformations. The diagnosis of abdominal pregnancy may be difficult from a normal pregnancy. Every women of reproductive age should seek advice from a doctor or other health service provider as soon as possible after her missed period. For decreasing of maternal morbidity and prenatal mortality rates, accurate and early diagnosis of abdominal pregnancy is necessary. Therefore early Ultra sonogram should be advised by obstetricians.

116 Tareq M; Haq AKMZ; Shuaib M; Salam AKMA. Inequity safe motherhood in slum and non-slum areas of Bangladesh: evidence from multiple indicator cluster survey-2003. *South Asian Journal of Population and Health*. 2009 July; 2(2): 99-107.

The main objective of the study was to present the features of the safe motherhood status in the slum area in comparison to the rural and the (non-slum) urban ones, inside the study area consisting of Dhaka and Chittagong divisions. The study also presented the comparative scenarios of the safe motherhood status between these two divisions. The data used in the study have been derived from Multiple Indicator Cluster Survey (MICS)-2003 conducted by Bangladesh Bureau of Statistics (BBS). To analyze the data, cross tabulation technique with chi-square test and logistic regression model with Weld test had been employed. Some important findings were found from the study results. The study showed that most of the mothers had received 'TT' doses' irrespective of areas and the percent of mothers receiving 'antenatal care service' was much lower in all the areas in comparison with TT' dose. Again, regarding the components 'place of delivery' and 'assistance during delivery', the features were not found to be good enough and the situation of rural areas was very much disappointing. Besides, it is beyond proof that slum mothers have much lower socio-economic status, but interestingly, as evident from the study results, they availed higher status of safe motherhood than that of the rural mothers. Comparing between the two divisions, it was found that the status of Chittagong was worse that that of Dhaka in case of 'place of delivery' and 'assistance during delivery'. The features of the slums of Chittagong regarding these two components were the worst. This might be due to the fact that unlike slums of Dhaka, slums of Chittagong have failed to attract the different government organizations and NGOs. So, policy makers should meet the health needs of Chittagong slums as well.

117 Tasnim S; Nazmeen S; Asaduzzaman M. Capacity development for adolescent friendly service at a periurban hospital. *ICMH Journal.* 2010; 1(1): 16-19.

The objective of this study was to orient a group of doctors on adolescent health issues and adolescent friendly services. A participatory training program often hour's duration was arranged in batches at institute of child and mother health during December2006 to June 20O7. Total 54 doctors participated. Nearly half of them had a work experience of 1-5 years and 69% were Assistant Registrars. A booklet comprising of definitions of adolescents, physiological process of puberty, becalmed of adolescents and related issues was distributed to them. Some genera information regarding their work experience, type of adolescent problems commonly seen and working environment was collected through self administered questionnaire. The study findings showed that very few of them ever received any training on adolescent care (3.2%). Common problems encountered by adolescents were described as leucorrhoea (44.04%), next was dysmenorrheal (40.04%), menorrhagia (37.03%) and unwanted/unplanned pregnancy (33.3%). Most of the participants had knowledge score less than 50% in pretest (94.4%); however, 64.8% had a score of> 80% in post test. The training was regarded as useful and enjoyable by most of the doctors. Regular provision of such training would contribute to Capacity development for adolescent friendly services. So, it is recommended to expand such services in the health care facilities throughout the country.

118 Tofail F. Effect of arsenic exposure during pregnancy an infant development at 7 months in rural Matlab, Bangladesh. *Environmental Health Perspectives,* 2009, Feb; 117(2): 288-292.

The objective of this study was to assess the relationship between prenatal arsenic exposure and infant's cognitive and motor development at seven months of age. The study conducted a large population based area with 4,436 pregnant women in Matlab, Bangladesh, an area of high arsenic

contaminated tube wells. The authors measured arsenic concentration in spot urine specimen at 8 and 30 weeks of pregnancy. They assessed a sub-sample of 1,799 infants, born to these mothers, at 7 months of age on two problem solving tests (PSTs), the motor scale of the Bayellgy scales of Infant Development –II, and behavior ratings. The study found that arsenic concentrations in maternal urine were high, with a median (inter quartile ranger) of 81 pg/I. (37-207 pg/I) at 8 weeks of gestation and of 84 pg/L, (42-230 pg/L) at 30 weeks. Arsenic exposure was related to many poor socioeconomic conditions that also co related with child development measures. Multiple regression of children's motor and PST scores and behavior ratings, controlling of socio-economic background variables, age and sex, showed no significant effect of urinary arsenic concentration on any developmental outcome. So the researchers detected no significant effect of arsenic exposure during pregnancy on infant development. However, it is possible that others effect are as yet unmeasured or that effects will become apparent at a later age. It is possible that other cognitive function is affected and that effects may appear at following years. There remains an urgency to reduce arsenic exposure in pregnancy owing to the increase in prenatal and infant mortality previously reported in this area.

2.4 CHILD HELATH (nutrition, growth monitoring, breast feeding, immunization, diarrhea etc.)

119 Al-Masud MM; Milton AHC; Akhtaruzzaman M. The impacts of food habit and sanitation on child (Under-5) in relation to their diarrheal disease. *Bangladesh Journal of Nutrition.* 2007-2008 December; 20-21: 9-16.

It was a cross sectional study to find out the impacts of food habit, sanitation and socio-economic condition in relation to child's diarrhoeal disease. The study was conducted in two rural areas i.e. Habitat village under Batiaghata upazilla and Hulhulia village under Kalaroa upazilla of Bangladesh through 82 households and 105 children under 5. In this study, it was found that 63 percent of children at Hatibati village and 62 percent of children at Hulhulia village have suffered from diarrhoea at least one time in a year. In this study it was found that 52 percent of child's parents were educated. Fifty percent of child's mother was not aware about sanitation and child health, 67 percent of children father have income below Tk.3000 per month. About 11 percent of children never drank breast milk in their life and 76 percent of children did not wash hand before taking food. Only 30 percent of children used sanitary latrine for defecation. Forty percent of child's father had no radio/TV and 29 percent of child's father had no latrine for their defecation. The present study suggests that the Government and other NGOs should take initiatives to educate and make aware rural people about sanitation and child health, provide earning sources to them and improve their socio-economic conditions for mitigating child's diarrhoeal disease.

120 Anonymous. Study to identify ways to increase postnatal care coverage. Dhaka: NIPORT and University of Dhaka, Bureau of Economic Research, 2007.

The study was carried out to explore socio-economic and cultural determinants of utilization of postnatal care services in rural Bangladesh and find out ways and means for increasing coverage of postnatal care services for mothers and children. It was a cross-sectional study. Both the qualitative and quantitative methods were used to conduct the study. Both the qualitative and quantitative methods were used to conduct the study. Information was collected at community level from mothers who had a live birth in the one year preceding the interview and family decision makers, such as husbands and mother-in-law and service providers such as SACMOs/FWVs.etc. Ten EPI outreach centers were selected from reach of the selected Upazila. The study had successfully interviewed 2,548 mothers. The study results showed that very low utilization of PNC for mothers and children. Only one-fifth (19.3%) of the mother received PNC and it was even less (17.6%) for children. The multivariate analysis demonstrates that access to pregnancy and delivery care was the most powerful determinants of PNC for mothers and children. Mother's education and household economic status can also be considered as determining factors of PNC. It is also revealed that regular exposure of radio and TV did not have notable impact on utilization of PNC for mothers and children. It was observed that utilization of PNC for mothers in significantly associated with ANC visits. Irrespective of the number of antenatal care visits, nearly one third of the mothers had received postnatal checkup. But among mothers who had three or more ANC visits, the proportion of mothers received PNC checkup raised to 40%, while the proportion was four times low (only 10%) among mothers who did not have any ANC visits. Regarding PNC for children the trend is similar but the proportion is slightly lowers. The data showed that erective of numbers of ANC visits, one-forth of the children had received PNC checkup. The proportion of utilization of PNC for children was the highest (39%) among mothers who had fulfilled standard ANC visits for three or more times. However, utilization of PNC for children was only 9% among mothers who did not have access to antenatal care. Supportive roles of family and community are considered essential for promoting PNC. As a

result misconception prevails in the community and family does not have the power to understand the needs and take decisions in mothers related to mothers and newborn health care. Therefore, the utilization pattern of PNC for mothers and children is inadequate, incomplete and not timely. The study finally recommended that PNC should be considered as a component of safe motherhood and promoted along with ANC and safe delivery and a standard guidelines for safe motherhood with PNC service components for mother and children need to be developed and implementation under maternal health strategy.

121 Arifeen, SE et al. Effect of the integrated management of childhood illness strategy on childhood mortality and nutrition in a rural area in Bangladesh: a cluster randomized trial. *Lancet.* 2009; 374: 393-403.

The aim of the study was to assess the effect of integrated management of childhood illness (IMCI) on mortality and nutritional status in children younger than 5 years, and the cost-effectiveness of the strategy. In this cluster randomized trial, 20 first-level government health facilities in the Matlab sub-district of Bangladesh and their catchment's areas (total population about 350,000) were paired and randomly assigned to either IMCI (intervention; ten clusters) or usual services (comparison; ten dusters). All three components of IMCI—health-worker training, health-systems improvements, and family and community activities—were implemented beginning in February, 2002. Assessment included household and health facility surveys tracking intermediate outputs and outcomes, and nutrition and mortality changes in intervention and comparison areas. Primary endpoint was mortality in children aged between 7 days and 59 months. Findings of the study showed that the yearly rate of mortality reduction in children younger than 5 years (excluding deaths in first week of life) was similar in IMCI and comparison areas (8.6% vs. 7.8%). In the last 2 years of the study, the mortality rate 13.4% Lower in IMCI than in comparison areas (95% Cl—14.2 to 34.3), corresponding to 4.2 fewer deaths per 1000 live births (95% CI—4.1 to 12.4; p=O.30). Implementation of IMCI led to improved health-worker skills, health-system support, and family and community practices, translating into increased care-seeking for illnesses. In IMCI areas, more children younger than 6 months were exclusively breastfed (76% vs 65%, difference of difference 10-1%, 95% CI 2.65—17.62), and prevalence of stunting in children aged 24-59 months decreased more rapidly (difference of differences—7.33, 95% CI—13.83 to-0.83) than in comparison areas. IMCI was associated with positive changes in all input, output, and outcome indicators, including increased exclusive breastfeeding and decreased stunting. However IMCI implementation had no effect on mortality within the time-frame of the assessment.

122 Baqui AH; Arifeen SE; Wiliams EK; Ahmed S; Mannan I; Rahman SM; Begum N; Seraji HR; Winch PJ; Santosham M; Black RE; Darmstadt GL. Effectiveness of home-based management of newborn infections by Community Health workers in rural Bangladesh. *Pediatric Infect Dis J.* 2009; 28: 304-310.

The study was undertaken to examine the relative effectiveness of neonatal infection management by CHWs, qualified medical providers, and other types of providers or no treatment, using surveillance data that CHWs collected while assessing, referring and treating neonates in the home-care study arm. In one study arm of a cluster randomized controlled trial, CHWs assessed neonates at home, using a 20-sign clinical algorithm and classified sick neonates as having very severe disease or possible very severe disease. Over a 2-year period, 10,585 live births were recorded in the study area. CHWs assessed 8474 (80%) of the neonates within the first week of life and referred neonates with signs of severe disease. If referral failed but parents consented to home treatment, CHWs treated neonates with very severe disease or possible very severe disease

with multiple signs, using injectable antibiotics. The study found that very severe disease, referral compliance was 34% (162/478 cases), and home treatment acceptance was 43% (204/478 cases). The case fatality rate was 4.4% (9/204) for CHW treatment, 14.2% (23/162) for treatment by qualified medical providers, and 28.5% (32/112) for those who received no treatment or who were treated by other unqualified providers. After controlling for differences in background characteristics and illness signs among treatment groups, newborns treated by CHWs had a hazard ration of 0.22 (95% confidence interval [CI] = 0.07-0.71) for death during the neonatal period and those treated by qualified providers had a hazard ration of 0.61 (95% CI=0.37-0.99), compared with newborns who received no treatment or were treated by untrained providers. Significantly increased hazards ratios of death were observed for neonates with convulsions (hazard ration [HR]= 6.54; 95% CI= 3.98-10.76) chest in-drawing (HR= 2.38, 95% CI=1.29-4.39), temperature <35.3ºC (HR= 3.47, 95% CI=1.30 - 9.24), and unconsciousness (HR= 7.92, 95% CI= 3.13-20.04). Home treatment of very severe disease in neonates by CHWs was effective and acceptable in a low-resource setting in Bangladesh. As recommendation, it may be commented that careful planning and appropriate technical assistance to key stakeholders would be essential before scale dissemination a scale-up of this national strategy on the regards.

123 Baqui AH. Community based validation of assessment of newborn illness by trained community health workers in Sylhet district of Bangladesh. *Tropical Medicine and International Health*. 2009 Dec; 14 (12): 1448-1456.

This study was undertaken to compare the performance of community health workers with 6 weeks of training in assessing neonates using an IMCI type algorithm, with that of physicians using the some clinical algorithm. Study data were collected during the period of Aug. 2005 to May 2006. Two hundred and eighty eight newborns were assessed independently by a community health worker and a study physician. Based on a 20 sign algorithm, sick neonates were classified as having very severe disease, possible very severe disease or no disease. The physician's assessment was considered as the gold standard. The study results revealed that community health workers correctly classified very severe disease in newborns with a sensitivity of 91%, specificity of 95% and kappa aluc of 0.85 ($p< 0.001$). Community health workers recognition showed a sensitivity of more than 60% and a specificity of 97-100% for almost all signs and symptoms, CHWs classification of VSD had a 90.5% sensitivity, 95.3% specificity and kappa value of 0.85 ($p<0.001$) which corresponds to almost perfect agreement between CHWs and physicians assessment. The study corroborates limited evidence that CHWs can recognize signs of illness and classify illnesses in newborns during the first month of life using a clinical algorithm. The study recommended that CHWs can assess newborns with very high sensitivity and specificity provides strong support for expansion of community based neonatal health care in setting where the burden of newborn illness is high and care seeking is low.

124 Choi Y; Arifeen SB; Manan I; Rahman SM; Bari S; Darmstadt GL; Black RE; Baqui AH. Can mother recognize neonatal illness correctly? Comparison of maternal report and assessment by community health workers in rural Bangladesh. *Tropical Medicine and International Health.* 2010; 15(6): 734-753.

The objective of this study was to validate maternal report of neonatal illness compared to assessment by CHWs, among mothers whose neonates were assessed by CHWs through home biased routine surveillance of neonatal illness in two rural areas of Bangladesh. Surveillance in the intervention area of two clusters randomized, controlled trials of newborn interventions conducted in Sylhet district and Mirzapur sub district of Bangladesh. Community Health Workers

(CHWs) promoted birth and newborn care preparedness during two parental visits, including recognition of neonatal illness. CHWs assessed 8472 neonates on post natal days 0, 3, and 6 between 2004 and 2005 in Sylhet, and 7587 neonates on post natal days 0, 2, 5 and 8 between 2004 an 2006 in Mirzapur, Tangail. In both sites, CHW identified neonates with very severe disease (VSD) using clinical algorithm that included ascertainment of illness history reported by mother and observation of clinical signs of illness. The authors calculated sensitivity, specificity, positive predictive value and negative predictive value of maternal report of any illness sign compared to CHWs assessment and classification of VSD. The study results showed that differences in maternal age, parity and education attainment were significant between two sites, reflection higher fertility and lower socioeconomic conditions in Sylhet and in Mirzapur. Of the neonates, 4.2% and 4.9% were identified to have SD by CHWs at least one during the routine visit window, but only 2.2% and 1.8% of mothers reported any signs of illness, in Sylhet and MIrzapur, respectively Maternal report of any signs had sensitivity of 24% and 20% and positive predictive value of 45% and 54% in Sylhet and Mirzapur respectively. Maternal recognition of neonatal illness at home was poor in two rural areas in Bangladesh. Intervention need to be designed to improve maternal recognition and routine post natal assessment by CHWs at home may be an essential component of community-based newborn care to improve care seeking for newborn illness. Therefore interventions also need to address additional socio cultural barriers in after successful recognition of illness, in order to improve care seeking for neonatal illness in this population.

125 Chowdhury AKA; Khan OF; Matin MA; Begum K; Galib MA. Effect of standard treatment guidelines with or without prescription audit or prescribing Acute Respiratory Tract Infection (ARI) and diarrhea in some Thana Health Complexes (THC's) of Bangladesh. *Bangladesh Medical Research Council Bulletin*. 2007; 33(1):21-30.

It was a retrospective study followed by intervention study to examine the effectiveness of standard treatment guidelines (STG) supported by prescription audit/or without it in influencing the prescribing behavior of the THCs doctors for ARI and diarrhea. Three equal groups of THC's achieving performance records determined by the prescribing survey were randomly selected 60 thanas (THCs) of Dhaka Division for the study. The doctors of the THCs of group I and II received STG audit and STG only respectively as interventions. The doctors of THCs of group III (control) received no intervention. The study findings showed that in the respected THCs unnecessary antibiotics were prescribed in more than 50% of the encounters. The study again revealed that in 26 THCs, comprising 41.6% of 38 THCs, the situation was even worse regarding the discriminate use of antibiotics. In these THCs antibiotics were prescribed in $\geq$ 72% of the encounters. The 24 out of 26 were performing THCs for ARI management, were grouped into three groups: Group-I (implementing STG + audit), Group-II (ST) and Group-III (no intervention, control) the prescriptions of the THCs belonging to Group-I and Group-II received STG + Audit and STG only respectively as intervention (s). On the contrary the prescriptions of the THCs of Group-III (control) did not receive any intervention. It was observed that after the implementation of interventions the use of the unnecessary antibiotics to treat ARI was significantly reduced ($0<0.01$) compared to pre-intervention period in Group-I (STG + Audit). In this group highly significant ($p<0.000$) reduction in antibiotics use was achieved in 6 out of 8 THCs. The average reduction in antibiotics use in terms of encounters was 23.7 and 15.2% in the Group-I and Group-II respectively owing to the intervention (s). Significant reduction in antibiotic use in terms of THCs was 3 (out of 8 THCs) and 2 (out of 8 THCs) belonging to the Group-II and Group-III respectively. The study suggested that STG supported by prescription audit are highly effective interventions to change the prescribing behavior of the prescriptions for ARI in the THCs. A little

vigilance and monitoring on the part of the senior doctors of the district health administration would be sufficient to implement the interventions.

126 Das JC. Fluid and electrolyte homes stasis in newborn baby. *Journal of BCPS*. 2008 Jan; 26(1); 39-45.

This review paper is written to orient and update health personals particularly the clinicians regarding some fundamental aspect of such important topic to help neonate through allowing such vital changes to occur appropriately. Electrolyte and fluid assessment during neonatal period is very important but difficult. In future water and electrolytes is constantly supplied from mother that is cut off by delivery of the baby. Extra cellular fluid volume that is greater than intracellular fluid velum in fetus precipitously decreases after birth. Adaptation of fluid and electrolyte after birth in due to discontinuation of placental exchange, on set of insensible water loss, thermoregulation, autonomic renal regulation and intake of fluid and other nutrients. The adaptation course is divided into transition phase. Further more fluid and electrolyte assessment generally focuses or body water, serum sodium potassium and calcium concentrations. A weight loss of 5-10% in term[18] infants and 10-20% in preterm[19] infant is common during the first week of life. Approximately 50% of total plasma calcium is bound (predominantly to albumin) and 50% is ionized. Ionized calcium is the best indicator of physiologic blood calcium activity. After birth if needed, fluid without minerals is supplemented and minerals are added when initial dieresis has occurred. The objective of management of this environment is not to maintain the status after birth but to allow the changes to occur appropriately. Clinicians are to be updated enough regarding this change. Proper understanding of fluid and electrolyte homeostasis of newborn baby will make problem related to such environment preventable with a favorable change in neonatal health. So electrolyte with intra-venus fluid should be offered after ensuring initial dieresis, a decrease in sodium or at least 5-6% weight loss in neonates.

127 Haider R; Rasheed S; Sanghvi TG; Hassan N; Pachon H; Islam S; Jalal CSB. Breastfeeding in infancy: identifying the program-relevant issues in Bangladesh. Dhaka: ICDDR, B, 2009.

The aim of the study was to delve deeper into the reasons for mothers' infant feeding practices, and to use this information to identify and refine the training and communication strategies for effective community interventions and improved breastfeeding practices. For identifying program-relevant issues to improve breastfeeding in infancy, quantitative data were collected through visits to households (n=356) in rural Chittagong and urban slums in Dhaka, and qualitative data from sub-samples by applying semi-structured in-depth interviews (n=42), focus group discussions (n=28), and opportunistic observations (n=21). Trials of Improved Practices (TIPs) (n=26) were conducted in the above sites and rural Sylhet to determine how best to design further interventions. This analysis focused on five breastfeeding practices recommended by the WHO: putting baby to the breast within the first hour of birth, feeding colostrums and not giving fluids, food or other substances in the first days of life, breastfeeding on demand, not feeding anything by bottle, and exclusive breastfeeding for the first six months. Results of the study found that the biggest gaps were found to be in putting baby to the breast within the first hour of birth (76% gap), feeding colostrums and not giving other fluids, foods or substances within the first three days (54% gap), and exclusive breastfeeding from birth through 180 days (90% gap). Lack of knowledge about dangers of delaying initiation beyond the first hour and giving other fluids, foods or substances, and the common perception of "insufficient milk" were main reasons given by mothers for these practices. Health workers had talked to only 8% of mothers about infant

feeding during antenatal and immunization visits, and to 34% of moths during sick child visits. The major providers of infant feeding information were grandmothers (28%). The findings also showed that huge gaps continue to exist in breastfeeding behaviors, mostly due to lack of awareness as to why the recommended breastfeeding practices are beneficial, the risks of not practicing them, as well as how to practice them. Health workers' interactions for promoting and supporting optimal breastfeeding are extremely low. Counseling techniques should be used to reinforce specific, priority messages by health facility staff and community-based workers at all contact points with mothers of young infants.

128 Hamadani JD; Grantham-McGregor SM; Tofail F; Nermell B; Fangstrom B; Huda SN; Yesmin S; Rahman M; Vera-Hernandez M; Arifeen SE; Vahter M. Pre-and postnatal arsenic exposure and child development at 18 months of age: a cohort study in rural Bangladesh. *International Journal of Epidemiology*. 2010; 1-11.

The aim of this study was to assess cognitive, motor and language development at 18 months of age, when tests are predictive of later function than at 7 months of age. The study also examined concurrent urinary concentrations of arsenic metabolites as markers of exposure and metabolism. A longitudinal cohort study beginning in early pregnancy was conducted in rural Bangladesh where arsenic concentrations in well water vary considerably. It assessed the effects of pre and postnatal arsenic exposure on development of 2112 children at 18 months of age with Bayley Scales of Infant Development-Il (Mental and psychomotor development indices), Wolke's Behavior Rating Scale and maternal report of language. The study related the measures of child development to arsenic concentrations in maternal urine in gestational weeks 9 and 30 and child's urinary arsenic at 18 months of age. Details of socio-economic background, home stimulation and anthropogenic measurements of mothers and children were also available. The study results revealed that median maternal urinary arsenic concentration averaged over early and late gestation was 35µg/1 whereas children's urine contained g of arsenic. There was no significant effect of any of the arsenic exposure measures on any of the child development measures after controlling for social and economic confounders, child's age and sex. Contrary to expectations, the study found no indications of adverse effects pf pre or postnatal arsenic exposure on child development at 18 months. It remains possible that duration of exposure is critical and that effects will become apparent later in childhood. Therefore, further research is warranted to clarify the effect of arsenic, alone or in combination with other toxic substances, at a large age.

129 Imam S; Yasmeen S; Rahman M; Ahmed SMM; Parveen S. Factors related to recovery from severe pneumonia of under five children in some selected hospitals of Dhaka city. *Bangladesh. Med Coll J.* 2007; 12 (10): 17-21.

This study was undertaken to determine the association between these factors and the average time of recovery from severe pneumonia. The mortality and morbidity patterns, rate of hospitalization, cost of treatment and the care seeking behaviors for severe pneumonia are expected to be influenced through this association. A cross sectional study was carried out among 103 under five children suffering from severe pneumonia admitted at Dhaka Shishu Hospital during the period of March to June 2005 to assess the factors related to recovery under five children suffering from pneumonia. Sampling was done purposively on the basis of diagnosis under-five children as severe pneumonia at the hospital. A pre-tested semi structured questionnaire was used to collect information by face to face interview with the attendants. The study results revealed that mean age of the children was 7.37SD $\pm$ 10.13 months. Among 103 children, 77 were below 6 months of age. The children aged between 2-24 months (92.4%) and

25-60 months (7.4%) took 6.06 days and 6.83 days to recover from illness respectively. Among the children 47 (45.6%) were female and 56 (54.4%) were male and they took 5.89 days and 6.30 days to recover. Majority (71.8%) belonged to nuclear family. About 61.2% respondents had monthly income of Taka 2000-6000 and 38.8% between taka 6,001-20,000. The children from lower income group took average 6.54 days and higher income group 5.45 days to recover, which was statistically significant. The children of smoker parents took .91 days and non smoker parents took 5.84 days to recover. No significant relation of smoking and recovery period of illness were found. Average time for recovery from breastfed and non breastfed children was 6.14 and 6.00 days respectively, which was not statistically significant. The children who were related according to IMCI (Integrated Management of Childhood Illness) guideline was about 68% and took average 6.41 days and the children who were treated without following IMCI guideline were 32% and took average 5.48 days to recover from illness, which was statistically significant ($p<0.05$). In fine, it may be told that the improvement of some of the factors which were found to be associated to the early recovery would eventually reduce toe hospital load, bed occupancy rate, treatment cost and national health care expenditure as well.

130 Khanam W; Hossain M; Sharifa T; Ara H; Rahman N; Nasrin S; Datta L. Neurodevelopment outcome of children with hypoxic-ischemic encephalopathy in first two years attending a neurodisability service at ICMH. *ICMH Journal*. 2010; 1(1): 20-24.

The aim of this study was to assess the neurodevelopment outcome of newborn with different grades of HIE in the first two years. The prospective study was carried out among the full term new born with HIE admitted in the newborn unit and subsequently followed up in the Child Development Centre of ICMH from January 2005 to December 2007. Studied children were categorized as Grade I, H & HI H1E. Neurodevelopment outcome at age one and age two years were measured as percentage of developmental age (DA) for chronological age (CA). When DA fall below 33% of CA it was classified as mik4 34% - 66% below CA as moderate, >66% below CA as severe impairment A total fifty children were enrolled who completed one to two years follow up. Mean age at first follow up was 43.3 (±30.4) Among 50 children, 5(10%) were in grade I, 40 (80%) in grade II, 5(10%) in grade III HIE. Of the five children with grade I HIE, 60% had age appropriate development and 40% had mild impairment at age one and two years. The children with grade II HIE 57.5% had mild, 37.5% had moderate, 5% had severe impairments. At one year. In the same group 23 children completed 2 years follow up, 4.4% showed age appropriate development, 43.5 % mik4 39.1% moderate, 13% severe impairments. Among five children with grade HI HIE 20 % had mild, 40 % moderate, 40% severe impairments at the age one year. In the same group two third (66. 7%) showed severe impairment and one third showed moderate impairment at two years. At the end of two years 83% had motor impairment (22% hemiplegia, 10% spastic quadriplegia and 1% mixed type of CP) Seizure was found in 86% of total children Good seizure control was achieved in 51%, partial control in 39.5% children with antiepileptic. There was significant association between severity of HIE with seizure control ($p< 0.05$). So the neuro-developmental outcome of children with HIE of II and III were poor and children with grade-I HIE showed better outcome, 60 % achieved age appropriate development.

131 Raqib R; Ahmed S; Sultana R; Wagatsma Y; Mondal D; Hoque AMW; Nermell B; Yunus M; Roy S; Persson LA; Driteen SE; Moore S; Vahter M. Effects of in utero-arsenic exposure on child immunity and morbidity in rural Bangladesh. Journal homepage: WWW. Elsevier.com/locate taxied, 2009; 185: 197-202.

The present study aimed to evaluate effects of intrauterine arsenic exposure on thymic size and thymic function in children up to 1 year of age and anthropic factor in breast-mild. For conducting the study pregnant women were enrolled at 6-10 weeks of gestation in Matlab a rural area of Bangladesh, extensively affected by arsenic contamination of tube well water. Women (h=140) delivering at local clinics were in clouded in the study, Anthropometry and morbidity data of the pregnant women and their children as well as infant thymic size by sonograph were colleted. Maternal urine and breast milk were collected for immune marker and arsenic assessment. Maternal urinary arsenic during pregnancy showed significant negative correction with interbukin-7 (1l-7) and lactoferin (Lft) in breast milk and child thymic index (TI). Urinary arsenic was also positively associated with fever and diarrhea during pregnancy and acute respiratory infections (ARI) in the infants. The effect of arsenic exposure on ARI was only evident in male children. The mean age of pregnant women (n=140) was 25.8 years. In the cohort of infants,17.8% had low birth weight (<2.5 kg), 46.4% were females and 96% were immunized will all EPI vaccines (Diphtheria, Pertusis, Tetanus, polio, BCG) Only 9% of the infants were exclusive by breast feed up-to 3 months of age. However all mothers continued breast feeding up-to the age of 12 months of age and the majority of the children were predominantly breastfed. There was a large inter individual variation in arsenic exposure with over all ranges of 7-2020 and 4-1126 pg/l, respectively, in early and late gestation, The study findings suggested that in utero arsenic exposure impaired child thymic development and enhanced morbidity probably via immuno supervision. Urgent intervention strategies will be needed to counteract and mitigate the toxic effects of arsenic exposure during pregnancy.

132 Rasheduzzaman S; Munos, MK; Winch PJ; Mullany LC; Mannan, I. et al. Community based health workers achieve high coverage in neonatal intervention trials: a case study from Sylhet, Bangladesh. *J Health Popul Nutr*. 2010 Dec; 28 (6): 610-618.

This study was undertaken with the practical implications and operational challenges associated with the deployment of large cadres of community-based workers to evaluate neonatal intervention: the two-tier system of community based health workers established as part of a large, cluster randomized efficacy trial of chlorhexidine for cleansing the umbilical cord in rural Bangladesh. The study was conducted for advancing the Health of Newborns and Mother study (projahnmo II) in rural areas of Sylhet district, Bangladesh, is a cluster randomized efficacy trail of 4.0% chlorhexidine for cleansing the umbilical cord in neonates. The study population for this community based trail included al live born infants delivered in 22 unions (administration units) in three rural sub-districts (Zakiganj, Kanaighat and Beanibazaar) of Syhlet district. The study area was divided in to 133 CHW clusters, each of which was randomly allocated to one of three cord care regimens. Enrolled newborn in each cluster received the cord care regimen assigned to the cluster in which they were born. The study results revealed that at any given time, the trial employed approximately 133 community health workers each responsible for 4-5 village health workers and a population of approximately 4,000. Over the entire trial period, 29,760 neonates were enrolled and 87% of them received the intervention (their assigned cord care regimen) within 24 hours of birth. Approaches to recruitment, training and supervision in the study are described. Key lesson included the importance of supportive processes for community based workers, including a strong training and field supervisory system, community acceptance of the

study, consideration of the setting study objectives and human resonant available. The basic analysis on selected monitoring indicators was done manually by the CHWs and their supervisors at field office during the fortnightly review meeting. This built in system of real time data processing enabled the study managers to track key indicators, such as pregnancy surveillance rates, birth rates, newborn case visits conducted, and most critically timing and coverage of intervention delivery and to quickly identify and address problems. So, a parallel effort might be necessary to institute application of chlorhexidine for cleansing in facility based deliveries, where problems with newborn infections again are important.

133 Shilpi T; Sattar H; Miah MRA. Determining infant's age for measles vaccination based on persistence of protective level of maternal measles antibody. *Bangladesh Med Res Couc Bull*. 2009; 35(3):101-104.

The present study was conducted to find out the appropriate time where maternal antibody tire in infants is being cleared and become susceptible to measles infection. The study was performed on pregnant mothers admitted at BSMMU, Ad-Din Hospital and ICMH and their babies from birth to 6^{th} months of age over a period of 1 year. Healthy pregnant mothers before delivery and their babies with weight > 2kg and Apgar score >7 at birth were included in the study. Pregnancy was recorded on a pre-designed data sheet. 3 ml. of venous blood samples were collected from each of 157 mothers (1^{st} samples). Similarly, cord blood samples were collected from their offspring (1^{st} sample) and preserved properly. The study findings revealed that the mean measles I gG antibody titer detected in cord blood at birth (0 months) was 348.8 m IU/ml. which stripy decreased to 155.6 m IU/ml by the age of 2-3 months. After that the fall in antibody becomes relatively slower and decreased to 101.6 m IU/ml by the age of 3-5 months and 38.8 m IU/ml by the age of 5-6 months and to 19.2 m IU/ml. between the ages of 6 to 7 months. The fall in antibody level with the advance of age was statistically significant ($p<0.001$). Majority of the subjects (97.6%) exhibited protective level of antibody at birth. But only a little above one quarter (25.5%) of them persisted the protective level between the age of 2-5 months and none had protective level from 5 months onwards. From the findings of the present study it seems that measles' vaccination could be carried out before the age of 6 months. However, the sample size of the study was too small to generalize the findings to reference population. A large scale study is therefore recommended and on the basis of the findings derived from the study, measles vaccination could be rescheduled if needed.

2.5 UTLIZATION OF HEALTH SERVICES FACILITIES (satellite clinics, FWC, THC, EPI, etc.)

134 Ali SMK; Kabir MH; Hossain MA; Begum T. Assessment of the situation of utilization of alternative medical care in MC-RH services. Dhaka: NIPORT & Eusuf and Associates, 2010.

The objective of the study was to identify the utilization and effectiveness of herbal gardening in order to promote the use of alternative complimentary medicine for general health care and MCH-RH in Bangladesh. A multi-stage stratified random sampling technique has been adopted to select medicinal plant garden from all over the country covering all the six administrative divisions and districts under the program as stipulated in the TOR. Moreover, to ensure representation from all 64 districts of Bangladesh, 64 upazilas were selected from 64 districts. A total of 986 respondents from different categories were selected. The sample size from different categories are gardeners 117, Civil Surgeons 7, UHFPO 116, AMC Doctors 39, Households 476, local elites 238.Personal interview approach (face to face) was followed for data collection. The study results indicated that fifty one percent of the respondents were between 19 and 49 year of age. Ninety one percent rural household had one or more sick member in the family. More than 58% could consult AMC doctors. But as a whole 35% AMC practitioners were available for consultation. There are 38.47% homeopathic, 33.33% are Unani and 28.21% are Ayurvedic graduate doctors working in Govt. District Hospital. Gore general health they examine and treat daily on average 30 patients, 10 patients on reproductive health and another 10 for childhood diseases. The AMC doctor said that 62.3% patient faced no problem with AMC medicine. Herbal gardens have increased acceptance of AMC drugs by 82%. The gardeners, 116 in all interviewed, are largely male. All garden do have less that 40 plants out Govt. prescribed 50 planted in the Herbal garden. The gardeners are facing some problems like: a) no in built water supply in the garden; b) lack of garden nursing equipments; c) replacement of dead herbs; d) availability of fertilizer in time; and e) space of the garden is less than requirement. In order to supervise the garden, 78% of Civil Surgeons/UHFPO visit herbal garden and instruct gardeners for effective management of the garden. The advice people to plant and use medicinal herbs. The study observed that about 70% of the local leaders/elites use herbs as medicine and advice others to use medicinal herbs. They assumed that 75% people at times of illness use AMC. About 60% elites knew that there are herbal garden in their area. So, for further improvement the space of the garden is recommended to be increased and it is need to impart gardening education of the gardeners, along provision for continuous maintenance of the garden. Rural farmers are encouraged to grow more medicinal herbs and the Govt (AMC directorate) should take initiative to market the produce.

135 Al-Sabir A; Sultana S; Bhadra SK; Rahman M. Utilization of Essential Service Delivery (UESD) survey 2006. Dhaka: NIPORT, IEDCR, ACPR and GTZ, 2007.

The objective of the survey was to evaluate the utilization of the services provided under the Essential Service Delivery (ESD) in public, private and NGO services, especially by the lowest two (asset) quintiles of population. This study used a stratified multistage cluster sampling scheme of Bangladesh Demographic and Health Survey (BDHS) 2004. Instead of 361 preliminary sampling units (PSUs) of BDHS sampling scheme, UESD survey randomly selected 180 PSUs proportionately from urban and rural areas mainly due to reduce the time and cost of the survey. The study findings revealed that about a half of pregnant women received antenatal care from a medically trained provider (e.g. doctors, nurse, midwives, paramedics or SBAs) and another 5

percent of women received antenatal care from HA/FWA/CNP or unqualified providers. More than 50% of women made at least one visits during their pregnancy. Most of the Bangladeshi women who receive antenatal care get it relatively late stage in their pregnancy coverage and number of ANC visits also increases with the level of women's education, and the households economic status. Eighteen percent of births are assisted of delivery by medically trained providers, with just 11% of births attended by qualified doctors, and 6% by nurse/midwife and paramedics and less then 1% by SBA/HA/FWA. Only 14% of births look place in the health facilities. Only 17% mothers attend postnatal care within 42 days of delivery, and most check-up were received within first two days after delivery from medically trained providers. Only 13% of babies received a postnatal cheek-up by medically trained provider within the first two days of delivery. The contraceptive prevalence rate (CPR) for Bangladesh in 2006 is 58%. Almost one in two currently married women use modern methods (49%), while 10% use traditional methods. Only 7% used long lasting methods (IUD) Norplant, female sterilization and male sterilization. The public sector provides contraceptives to 53% of modern methods users, while 39% are supplied through private sector services, government fieldworker's supply 21% of users. Seventy six percent of children ages 12-23 months are fully vaccinated accounting to information from both the vaccination card and the mothers' reports. Among various vaccines, the coverage of single shoot BCG vaccines is the highest (96%) and measles vaccine is the lowest (83%). According to UESD survey 2006, more than four, out of five children age 9-59 months received Vitamin-A dose in the six months preceding the survey and the coverage increases with time since birth ARI prevalence increase with age to peak at 6-11 months (28%), then falls at older ages. Use of a healthy facility of a medically trained provider for the treatment of symptoms of ARI is low. Children in the highest wealth quintile and children of mothers with complete secondary one higher education are the most likely to be treated. Majority of children with diarrhea are treated with a solution made from ORS packets. Children whose mothers have complete secondary or higher education, and those who are from households in the highest wealth quintile have a much higher likelihood of seeking treatment for diarrhea from health provider. UESD survey 2006 can be used to review and monitor the progress of programs and to improve future policies and strategies.

136 Al-Sabir A; Sultana S; Bhadra SK; Alam M.A. Utilization of Essential Service Delivery (UESD) Survey 2008. Dhaka: NIPORT, 2009.

The survey was designed to provide information on the basic indicators of utilization of the services provided under the Essential Service Delivery (ESD) in public, private and NGO services especially by the lowest two (asset) quintiles of population. This survey used a stratified multistage cluster sampling scheme of BDHS 2007. Instead of 361 primary sampling units (Pus) of BDHS sample scheme, UESD survey systematically selected 180 PSUs proportionately from urban and rural areas mainly due to reduce the time and cost of the survey. In this survey, 10,000 household were visited, all ever married women age 15-49 who are usual residence of selected households were selected for interview. Data collection took place over one and half month period during Dec, 2008 to January 2009. The study results regarding reproductive health revealed that fifty one percent of pregnant women received antenatal care from a medically trained provider (eg. doctors, nurses, midwives, paramedics or CSBAs) and another 8% of women received antenatal care form HA/FWA/CNP or unqualified providers. ANC from medially trained providers increased from 46% in the 2006 UESD to 51% in the 2008 UESD. Women in the quintile were found far behind in receiving ANC compare to other osmotic stratum. Women in the highest wealth quintile were four times more (63%) likely to had ANC from private facility than women in lowest quintile (10%). Eighty six percent of mothers were protected against neonatal

tetanus for their last live birth. In the coverage of neonatal tetanus 79% among women from the lower quintile to 93%, among women from the highest quintile. Twenty on percent of birth were assisted by medically trained providers. Assistance of delivery by medically trained provider increased from 18% in the 2006 UESD to 21% in the 2008 UESD. Still four in every five births are delivered at home. Slightly over half of the mothers of new born (53%) went to private facilities to obtain postnatal checkup, while public facilities were reported by 36% of mothers. According to the 2008 UESD, the contraceptive prevalence rate (CPR) in Bangladesh has increased slightly from 58 percent in 2006 to 60 percent in 2008. Half of the currently married women use modern methods, while 10 percent use traditional methods. Only 4% use long lasting methods (IUD, Norplant, female sterilization and male sterilization), which is virtually unchanged since 2006. The public sector is the major source of contraceptive methods in Bangladesh. Eighty three percent of children age 12-23 months in Bangladesh if fully vaccinated, accordingly to the 2008 UESD about ninety percent children age 9-59 months received vitamin A dose in the six months preceding there survey. Only 4% of under-five children have the symptoms of ARI in the two week preceding the survey. Nine percent of children under age five years has experienced diarrhea in the two weeks preceding the survey.

137 Anonymous. Identify barriers in access to public health facilities in rural Bangladesh. Dhaka: NIPORT and ACPR, 2007.

The study was carried out to find out the barriers of the rural people in utilizing public health facilities, understand women's utilization of services for family planning, antenatal, delivery, postpartum care etc., and to identify different kinds of obstacles of hindrances that creates problem in obtaining services. The study collected information from a cross-sectional study approach and both qualitative and quantitative methods were used here to conduct the study. It retrieved the information mostly from clients, service providers and local leaders and also to obtain information case studies and focus group discussions were initiated. The results of the findings showed that poor people have no scope of participation in the decision making process as how health services should be delivered to there, regardless of quality of services. Although it was the key issues in both HNPSP and PRSP. According to community people, being ill means inability to more, work and eat properly. High fever, severe cold and cough, diarrhea, tuberculosis, arthritis, tumor, measles, chicken pox, eczema, cancer, abdomen pain, etc. are considered as disease to them. Among the households members who were ill and needed to be taken to the public health facility (during six months preceding the survey), 77% of them went (23% did not visit public health facilities). Of those, who did not visit public health facilities, about 87% reported that they did not seek care because of various problems associated with the public service delivery system itself. Other reasons are economic/financial (35%), physical geographical reasons (6%), psychological, cultural and personal (4.6%) and cognitive (1.5%). A large majority of the client mentioned that they did not seek care in the public health facility because of various non-conducive factors associated with the services delivery system itself. Such as unavailability of doctors, medical staff, drugs, pathology and diagnostic test, behavior of medical and non-medical staff, attitude towards the patient, spending or 'free' services such as drugs, test, etc. Economic/financial reasons such as transport cost, loss of earning for waiting etc. also hinder them of not going there. There are some cognitive problems such as they do not know where the asthma treatment is being done. The study recommended that the concerned authority should keep an eye to establish effective health watch groups in the local level; quality management is required in order to build responsive client focused services; health financing strategies should be designed to protect against catastrophic illness costs for the poor and protection against its impoverishing impacts; strong incentive along with greater managerial

control need to be instituted to ensure service delivery; drugs should be reached to the poor people with a low cost or free of costs, and finally, an attempt can be taken to identify the potential barriers from the health service providers to deliver quality to care to the poor people.

138 Anonymous. Utilization of MC-RH services at UHCs. Dhaka: NIPORT & ARTCOP, 2007.

The main objective of the study was to assess the utilization of MC-RH services provided at Upazila Health Complexes (UHCs) and formulate a policy recommendation to improve the quality and coverage of the MC-RH services in UHCs. The study followed a cross sectional statistical design to obtain information from the primary and secondary sources which comprise all relevant categories of respondents from the selected upazillas. A total of 72 program managers, 96 service providers and 600 women of reproductive age were selected for interviewed. Simple random sampling procedure was followed for the study. The findings of the study revealed that majority (89.5%) of the service users were Muslim and were less qualified. About 40% of them have just completed primary level. While 22.9% was illiterate, 44% of the service users were day laborer. It means they were belonging to low economic class. Analysis of respondents knowledge showed that most (91.6%) of the service users know that UHC provide MC-RH services and majority (95%) of them believed that a pregnant mother should go the UHC/trained service provider while remaining 5% did not think so. The major reported reasons for which they should go to the UHC/trained service providers were for the routine checkup (37.1%), to know the position of the baby (31.9%), to take vaccines and for measuring weight (30.1%) and for better care of mother and child (23.2%). About 13% of the service users claimed that quality of the service provided from different UHC was bad, while 22.9% thought quality of services was moderately good. However, majority of them (64%) reported that the quality of service provided from UHCs was good. About 88% users received MC-RH services at the time of last delivery. The percentage of ANC and PNC were 88.9% respectively. Majority (70.2%) of the service users have taken MC-RH services from UHC, while more then 50% took ANC services from the doctors chamber. About 97% respondents positively replied that training received on MC-RH is helpful in performing their responsibilities, while remaining 7% reported negatively. Most (97%) of the service providers claimed that they provide services to pregnant mother, while remaining 3% does not do so. Majority (94%) of the service providers believed that mothers of the locality are fully aware about the service centre of the locality. Analysis of program manager's knowledge on the extent of important given to provide service to the patient shows, 58.4% managers thought they provide good or very good attention in providing services to their clients while 5.6% provide moderately good attention. However, 36.1% program managers did not responded in this regard. It may be recommended that. i) awareness building program should be introduced, more training program on MC-RH is needed; more specialist doctors and skilled manpower should be appointed for better MC-RH services; for quality services, better sitting arrangement should be introduced; proper screen facility should be introduced to ensure privacy of the patients; modern equipments should be installed at the centers for checkup as well as examination purpose; and adequate supply of medicines should be ensured for quality MC-RH services at UHC.

139 Anonymous. Utilization of satellite clinic services. Dhaka: NIPORT & Gano Unnayan Sangtha (GUS), 2007.

The objectives of the study were to assess the level of awareness of the community about the existence, timing and services of the satellite clinics. Potential demand of services used to ascertain current utilization pattern of the clinics and to identify operational barrier in the socio-

cultural and programmatic context for utilization of services. The study followed both the quantitative and qualitative methods for data collection. Total 1248 respondents of four categories of sample (program manager, service provider, field worker, service recipient and non-recipient) were selected for interview. However, 1163 respondents were successfully interviewed. The observation result showed that almost half of the clinics conducted no motivational meetings. These data also indicated that MAs did not organize even two discussion meetings in a month for motivation of the community for MCH-FP services. The observation found that none of the clinics had adequate drugs and as such, non-availability of essential drugs and medicines was a major problem in satellite clinics. Most of the non-recipients reported to have knowledge about satellite clinics; a large majority of them heard about satellite clinics from field workers/ neighbors, non-recipients did not visit satellite clinic because they did not feel the need to go there. The observation revealed that the beginning time of satellite clinics was between 9-10 and 10-11 in the morning. Nearly 87.0% of the recipients reported that staffs of the clinics were very punctual. Both the FWVs and MAs were found although present on the specified day. Observation findings showed that privacy was some how maintained only in few clinics. For holding of satellite clinics, problem could be solved, if higher official could regularly supervise the satellite clinics. On an average, Senior Officials paid 2-4 visits to the clinics as stated by FWAs. It is evident that satellite clinics were not properly and quality supervised by Senior Officials. Some recommendations may be given which as followed; i) authority should strictly instruct the FWVs and MAs to organize more satellite clinics and conduct more motivational meetings at the community level; ii) adequate medicines, family planning method/contraception be available to the satellite clinics; iii) necessary steps should be taken to maintain privacy of the clients; iv) motivation work through family planning field workers should be strengthened with the involvement of community leaders; v) last of all, supervision of the satellite clinics activities be strengthened to ensure proper operation of satellite clinics.

140 Anonymous. Barriers of emergency contraceptive pill (ECP) utilization at the field level. Dhaka: NIPORT & ARTCOP, 2007.

The prime objective of this study was to identify the major barriers of information of emergency contraceptive pills in the national family planning program and its acceptability among Bangladeshi women. The data of the present study were collected form the primary, secondary and tertiary sources. Both the quantitative (in-depth interview to the selected respondents) and qualitative (FGD) method was used here. A total of 1296 samples (72 for program manager, 360 for service providers, 432 service recipients, 432 non-recipients (non-user) of ECP were selected for the study. Multistage random sampling procedure was used to select the sample. Findings of the study revealed that most of the users (67.4%) have primary and secondary education and among these groups 72.1% are non-users. Mean age at first marriage is 18.9 years for users and 18.5 years for non users. Un-willingly first pregnancy is 41.1% for users and 32.8% for non users. It is evident that ECP users are more conscious than non-users of ECP. Out of total 725 respondents, 69.5% heard about ECP service and among them 89% clients are aware about dose of position-2 and 93.3% know about ECP use duration from first dose to 2nd dose. Among the users group, 17.7% faced the problem to receive ECP service but 92% users are satisfied from their service. According to the client's point of view a high acceptability or cent percents have demanded the smooth ECP service. Unmet need is gradually decreasing. Out of 43 respondents, further decrease of unmeet need can be possible through the proper use of ECP with the help of publicity (74.4%) and awareness development (30.3%) of the potential clients. Program managers indicated that if the client use the ECP frequently, OCP use rate may decrease and problem can be raised in uterus and ovary. Highest majority (90.3%) of program managers noticed that the

reasons of poor number of ECP client are lack of publicity and/or becoming afraid. For the removal of ECP acceptors, 69% program manager emphasized on increasing the publicity on ECP. This study simply recommended that proper publicly for the eligible couple in different level clients through FWV should strongly be implemented, introduction of ECP and FWV and SACMO should maintain their regular office time, proper measure should be taken to inform about the price of ECP outside of the packet for the protection of MIS use. Abuse of ECP uses should be taken in to consideration reducing of misuse/abuse through monitoring and counseling by the service providers is recommended. ECP should not be sold in the local market for the promotion of abuse of ECP, refresher training can be arranged with skill personnel for the service providers and program managers' proper supervision and monitoring system should be developed to supervise and monitor the activity of FWV and FWA regarding ECP. A newly introduced contraceptive in family planning, ECP knowledge can be diffused through FWVs and FWAs, because they are grass root level worker in the rural community and also suggesting the empowering the FWVs and FWAs actively in the community through availability.

141 Anonymous. Effect of vaccines in MC-RH service delivery system. Dhaka: NIPORT & Gano Unnayan Sangstha (GUS), 2007.

The broad objective of this study was to evaluate the effect of vacancies in MCRH service delivery system. The study followed both the quantitative and qualitative methods for data collection. Basically 792 individuals of three category of sample (Program Manager, Service Provider and Service Recipient) were selected for interview. Finally, 704 respondents were successfully interviewed. Multistage random sampling procedure was used to collect sample from the three different categories. In order to assess the current status of the QOC in MC-RH-FP services in the country, a number of public facilities including Upazilla Health Complex and UHFWCs were observed. From the study findings, it is revealed that although ANC is offered all selected facilities but PNC service not offered by a number of UHFWCs and Upazilla Family Planning units. On the other hand, a number of selected Upazila and UHFWCs are not equipped to offer safe delivery. According the opinion of majority program managers, very few mothers have been taking pregnancy related delivery and post delivery care, adequate services were not provided to women and children from the center. They identified some reasons responsible for the situation e.g. inadequate number of service providers/paramedics irregularities of service provides/paramedics, inadequate transport facilities, over patient in respect to service providers. In contrast, only 2% patients visited the facility to receive PNC. Only 1% reported that they had visited the facility for safe delivery. The analysis of the waiting time by the exit patients for getting treatment showed that the waiting time was long. Very few mothers had been taking pregnancy and delivery related services and post delivery care, adequate services were not provided to women and children from the centers. The service providers have been facing different problems during service delivery. Inadequate member of service providers/paramedics in the centers were found vacant. The study also found inadequate supply of medicine, non-availability of all necessary equipments/instruments and inadequate privacy and seating arrangement. Based on study findings, the study suggested some actions which need to be taken to prevail over the existing barriers, as well as to ensure quality and coverage of MC-RH services, like; all the vacant post of the service providers and paramedics need to be filled-up immediately; provide adequate training to the service providers and paramedics; take initiative for regular presence of service providers/paramedics in the center; arrange adequate transport facilities; increase number of service providers; give adequate time for diagnosis and treatment; ensure necessary medicine supply; ensure necessary equipments / instruments; reduce waiting time for

treatment; privacy should be maintained; ensure supportive attitude and health environment in the health centers.

142 Anonymous. Identify the ways for utilization of data obtained through couple register and GR at upazila level and below. Dhaka: NIPORT & ACPR, 2010.

The study aimed to identify the ways for utilization of data obtained through couple register and GR at upazila level and below. As indicated in TOR, this was a cross sectional study. An integrated approach combine with both qualitative and quantitative methods were adopted to conduct the study. In addition, available secondary data were analyzed for the purposes. For statistical representation multi-stage sampling procedure was considered in deciding sample size. Information was obtained from secondary data analysis, data validation survey and interview of program personnel. During the survey, the program managers and local leaders stated that a large section of maternal deaths in Sylhet division is due to not receiving treatment on time. Using unskilled birth attendants during delivery happens to take many mothers lives. Only a small percentage, less than 11 percent of women in Sylhet division seek help from skilled and trained providers. The study observed that manpower shortage is a big crisis in serving clients. Even shops where clients can get contraceptives are not in their reach. Moreover all service centers are located relatively distance areas which make fieldworkers unwilling to serve their jobs and also force clients not to get services even if they are in need. Sylhet with all her problems with field workers, service centers and communication system, needs to go for permanent methods which require less contact with field workers after clients have started using permanent methods. Time gap between visitation cycles potentially delays clients decision to use long lasting methods and overall low performance of long lasting methods. Both program personnel and local leaders mentioned that building up awareness among mothers and empowering women through education make significant role in reducing child mortality in Sylhet. This is evident from the study results that willingness on the part of the program personnel and local leaders is much needed. With increasing workload of government facilities, help from non-government facilities can be sought, even though non-government organizations has not proved their efficiency to provide MC-RH services in Sylhet division. For serving clients well need based intervention program, such as health communication program preventive and curative program for newborn, special program to promote women's education are much needed. Continues activities such as meeting with local leaders, in-laws and court yard sessions, are needed to attract clients to receive services from trained personnel.

143 Anonymous. Situation analysis of Union Health and Family Welfare Centre. Dhaka: NIPORT and ACPR, 2007.

This study was undertaken with the aims to reduce maternal mortality through adequate provision of natal and delivery of care, to fasten fertility decline and to deliver the basic health care services to most of the people requiring the services. A cross sectional study was conducted in areas involving the UHFWCs. The study was conducted in twenty-four upazilas from each six divisions of the country. In order to collect the information, a situation analysis study (observation of activities including examination of quality issues of health services) as well as interview of the service providers and the clients (through interception of the outgoing clients out side of the centers) was conducted. In this study, the study personnel found that there is a UHFWC to provide health and family planning services in about all the unions of Bangladesh. In these service centers, there are few posts including the infrastructure to provide services. But many posts are vacant in these centers. Moreover, those who are working in these posts have not been found during the

working hours. The working SACMOs and FWVs have been working in the same place more than eight years. All of them are technical diploma holders. All the FWVs and the SACMOs have received several training during the servicing years. Though the FWVs have received the training on MCH and Reproductive Health, the SACMOs have received that many training during their servicing years. The construction and maintenance faults are also there in many places. Most of the rooms of the UHFWCs are left unused in all the UHFWCs. In some places broken chairs, tables, empty boxes, DDS kits are kept in those unused rooms. Though there are a number of chairs, tables, almirah medicine racks in these centers, they are left unused and dirty condition. More than half of the SACMOs and FWVs do not resides in those residential quarters, which were built for them. The supply of pure water is one of the major problems in the UHFWCs. Here the toilets are also very dirty and filthy. Even there is no separate toilet for the women. In some places, the toilets are being used as the store room. There is an inadequate of required equipments, e.g. FWC kits, IUD kit, lack of coordination between the SACMOs and FWVs in receiving the DDS kit for the UHFWCs. Availability of consumable products, such as gauges cotton, savlon, disposable syringe etc. varies by upazilas as well as UHFWCs. During the supervision, most of the supervisors supervise the management of the centre; examine the records, the stock maintenance and the store. But the SACMOs and FWVs told that most of the supervisors do not use necessary checklist to complete the supervision in an organized way. The study revealed that one-fourth of the total patients are male, generally they come to the UHFWCs for the treatment of fever, diarrhea, dysentery, cold cough, chest pain, blood pressure, gastric, piles, skin disease, allergy , headache, accident etc. A good number of patients were not happy with the behavior of clinic personnel even it is not allowed there are examples of taking fees by the UHFWCs personnel. The local leaders raised several issues, the reported issues are i) the UHFWCs are far from their households; ii) nobody asks community to go there; iii) females usually do not go to any place alone; iv) the doctor are not available all the time; v) ayurvedic and homoeopathic medicines are good for children; vi) the service providers do not provide good treatment, they only write down the prescriptions; vii) UHFWCs remain closed most of the cases; viii) some medicines are given fall all the diseases; ix) it is not known to them that the even the adults can get free medicine from there. Therefore, the several issues related to infrastructure, facilities, behavior, medicine and services are affecting the utilization of UHFWCs as well as quality of services. The UHFWC personnel never discussed with them to find out a suitable solution.

144 Banu RS; Ahsan GU; Yasmin N; Hossain MA; Hayder KA; Lahiry S. Utilization of emergency obstetric care services among post-natal mothers in the Keraniganj upazilla of Dhaka district. *SUBJPH.* 2008; 1(1): 12-19.

The study was carried out to explore the factors influencing the three delays of emergency obstetric care (ECO). A descriptive cross-sectional semi-structured questionnaire-based study was conducted among the mothers who delivered baby at hospital during the period of October 2006-November 2006 in the Upazila Health Complex (UHC), one Union Health and Family Welfare Centre (UHFWC), two private clinics and two NGO clinics in Keraniganj Upazila of Dhaka District. A total of 119 respondents were interviewed for the study. A pre-tested semi-structured self-administered questionnaire consisting of both closed and open ended questions was used in the study. The study found that the utilization rate was higher among the lower age group, and mean age was found to be 23$\pm$5 yrs. Most of the respondents (56%) completed secondary or higher secondary or higher secondary education. The median income of the families was Tk. 8,000. Respondents were having 1-2 child delivered at facilities ($p<0.05$). Significant association was found between mothers' educational status with the history of home trial ($p<0.01$). The median distance of the facilities was 2 km. Decision making for hospitalization was mostly

influenced by husband (54%), in-laws (29%), parental relatives (28%), Dai (8%) and by respondent herself (13%). Analysis indicated that delay at home had significant association with family income ($p<0.001$) and mothers' education ($p<0.001$). 78% of mothers were aware of at least 3 danger signs of pregnancy, and did not delay beyond 6 hrs. Major mode of delivery was caesarian section (64%). In public hospitals 56% delivery type was vaginal in comparison to 20% in private clinics ($p<0.001$). Cost of vaginal delivery was Tk 2,608 for public and Tk 4,738 for private facilities and NGOs on an average while cost of caesarian delivery was Tk 10658 and Tk 12478 respectively ($p=0.11$ for vaginal and 0.21 for caesarean). Therefore, highest priority program to increase female education, quality of ANC as recommended by the WHO protocol, program monitoring and evaluation can be emphasized to combat the menace.

145 Baqui AH; Arifeen SE; Darmstadt GL; Ahmed S; Williams EK; Seraji HR; Mannan I; Rahman SM; Shah R; Saha SK; Syed U; Winch PJ; Lefevre A; Santosham M; Black RE. Effect of community based newborn care intervention package implemented through two service delivery strategies in Sylhet district, Bangladesh: a cluster randomized controlled trial. *Lancet.* 2008 June; 371: 1936-1944.

The objective of the intervention study was to examine the effect of community based newborn care intervention package through government and non-government organization infrastructures to reduce neonatal mortality. In Sylhet district, 24 clusters (with a population of about 20000 each) were randomly assigned in equal numbers to one of two intervention arms or to the comparison arm. Because of the study design, masking was not feasible. All married women of reproductive age (15-49 years) were eligible to participate. In the home-care arm, female community health workers (one per 4000 population) identified pregnant women, made two antenatal home visits to promote birth and newborn-care preparedness, made postnatal home visits to assess newborns on the first, third, and seventh days of birth, and refereed or treated sick neonates. In the community-care arm, birth and newborn-care preparedness and care seeking from qualified providers were promoted solely through group sessions held by female and male community mobilizes. The primary outcome was reduction in neonatal mortality. Analysis was by intention to treat. The study findings found that the number of clusters per arm was eight. The number of participants was 36059, 40159, and 37598 in the home-care, community-care and comparison arms, respectively, with 14769, 16325, and 15350 live births, respectively. In the last 6 months of the 30-month intervention, neonatal mortality rates were 29.2 per 1000, 45.2 per 1000, and 43.5 per 1000 in the home-care, community-care, and comparison arms, respectively. Neonatal mortality was reduced in the home-care arm by 34% (adjusted relative risk 0.66; 95% CI 0.47-0.93) during the last 6 months versus that in the comparison arm. No mortality reduction was noted in the community-care arm (0.95; 0.69-1.31). A home-care strategy to promote an integrated package of preventive and curative newborn care is effective in reducing neonatal mortality in communities with a weak health system, low health-care use, and high neonatal mortality. The findings suggest that neonatal health programs should be integrated with other child survival and maternal health programs.

146 Davanzo J; Hale L; Razzaque A; Rahman M. Effects of inter pregnancy interval and outcome of the proceeding pregnancy on pregnancy outcomes in Matlab, Bangladesh. *Bangladesh Journal of Obstetric and Gynecology* (BJOG). 2007; Do 1: 10: 1111/: 1471-0528. 2007. 023382: 1-9.

The objective of this study was to estimate the effects of the duration of the proceeding IPI on pregnancy outcomes and the effects of IPI differ depending on the type of pregnancy outcome that

began the interval. This study used the data from Matlab, a typical rural sub district of Bangladesh. Data was collected on pregnancies and their outcomes through the Demographic Surveillance System (DSS) of the ICDDR, B. They consider data from the DSS on 66759 pregnancies that occurred in the MCH-FP area of Matlab between 1982 and 2002. In this study, bivariate tabulations and multinomial logistic regression analysis was done and main outcomes measures: pregnancy outcome (live birth, stillbirth, miscarriage [spontaneous fetal loss prior to 28 weeks] and induced abortion) was considered. The study results showed that socioeconomic and demographic covariates were controlled, of the IPIs that began with a live birth, those < 6 months in duration were associated with a 7.5 fold increase in the odds of an induced abortion (95% CI 6.0-9.4), a 3.3. Fold increase in the odds of a miscarriage (95% CI 2.8-3.9) and a 1.6 fold increase in the odds of a stillbirth (95% CI 1.2-2.1) compared with 27 to 50 month IPIs. IPIs of 6-14 months were associated with increased odds of induced abortion (2.0 95% CI 1.5-2.6). IPI $\geq$ 75 months were associated with increased odds of all three types of non live birth (NLB) outcomes but were not as risky as very short intervals. IPIs that began with a NOB were generally more likely to end with the same type of NLB. It also found that women whose pregnancies are between 15 and 75 months after a preceding pregnancy outcome (regardless of its type) have a lower likelihood of fetal loss than those with shorter or longer IPIs. Those with preceding NLB outcome deserve special attention in counseling and monitoring. The study suggested that future research should investigate the effect of pregnancy spacing and type of preceding pregnancy outcome on gestational duration, birth weight, and maternal morbidity and mortality.

147 Gazi R. et al. Demand-based Reproductive Health Commodity Project: end-line survey report. Dhaka: ICDDR, B, 2009.

The overall goal of the project is to improve the quality and delivery of health Services, particularly RH. Appropriate to the needs of the poor, in particular women and children, and to increase their access to those services. ICDDR, B has conducted the baseline survey in the two rural project sites and one urban slum area namely Nabiganj upazila under Sylhet division, consisting of 13 unions (the total population is 323357); Raipur upazila under Chittagong Division, consisting of 11 Unions (total population 260983) and Dhaka city slum areas, consisting of ward 24, 25, 26 and 47 (total population 141912). The overall household population includes 726252 persons, with females constituting 49.7% of the population. For the baseline survey, 19671 women of reproductive age, 2433 husbands and 3136 adolescents were interviewed. For end-line survey, 19637 women of reproductive age, 3340 husbands and 2457 adolescents were interviewed. The overall educational attainment of the married female respondents was low in all the areas. In the rural areas, a higher proportion of the women obtained contraceptive methods from the public sector. The family welfare centre (FWC) was a common source for contraceptive methods. In the urban areas, women obtained contraceptives from the NGO clinics. Over one-third of the men in the urban slums and in Raipur had no education. In Nabigonj, about 39-50% of the men had not completed primary education. However higher proportions of the men knew all the areas about indictable or condoms as contraceptive methods. They also knew about male or female sterilization in all the areas. Over 90% of the adolescents had ever been enrolled either in a school or in a madragh but 30-58% was currently enrolled in all the sites. In general more than 70% of the adolescents thought that a female should get married at the age of 18 or 19 years. Higher proportions of adolescents in urban slum and Raipur knew about contraceptive methods from their friends and neighbors. In general, 73-96% of adolescents were aware of a health facility in their locality.

148 Haider SJ; Begum F; Saha BR; Islam MN; Chowdhary SS; Rahman H. Follow-up of community-based skilled birth attendant (CSBA) activities in MC-RH-FP services. Dhaka: NIPORT and READ, 2007.

The current study was undertaken to evaluate the field performances of the CSBAs both quality and quantity aspects of their activities. Both the qualitative and quantitative methods of investigations were designed for the study. Under qualitative investigations, literature review/document search, checklists, intensive interviews (with SBAs), FGDs and observation were applied for data collection. Findings of the study were presented with the target samples of 65 SBAs; 300 currently married women giving birth to a child in last 2 years, 29 supervisors of SBAs; and 6 FGDs with 44 community leaders. In addition, findings on direct observation on SBAs performance on ANC and delivery were analyzed and discussed. The average population served by the SBAs is 5451, of whom 15% were currently married eligible couples and percent of women pregnant was 8%. All the SBAs expressed their confidences of rendering delivery services in the community independently. An SBA serves an area of an average 5451 population, 818 eligible couples and 65 pregnant women at a given time. Accordingly to the estimates of the SBAs, an SBA on an average provides delivery assistance to 3% women per month (range 1-10). At this rate as SBA (according to her estimates) covers 55% of the pregnant women while according to the estimates of the currently married women, the SBAs serves 42% of the pregnant women. Most of the SBAs (86-97%) specified 12 different services as part of ANC which they render in the community and the types rendered by the SBAs or ANC include history taking 92%; EDD costing 88% advice/advice on diet 97% advice on taking rest 94%; advice on clothing's and cleanliness 92% advice on taking iron, folic acid and calcium tablet 86% etc. Complication pregnancies faced by SBAs are swelling of legs (52%), blurring of vision (34%), urinary tract infection (34%), headache (32%). On an average the SBAs have covered 42% of the total deliveries in their catchments, while 58% are still performed by others, which would include mostly by non-trained hands almost the mothers (96%) who received services from the SBAs expressed their satisfaction. Out of 29 supervisors, 25 told that this perform supervisory factions for the cases referred by the SBAs. Less than half (45%) of the supervisors mentioned that the SBAs faced many problems during their work in the community. Findings of the direct observation of SBAs services at community level or ANC and delivery care performances were related as remarkably good. According to the findings of the study, some recommendations may be given: i) additional refresher training on specialized skills are needed, ii) number of trained SBAs may be increased, iii) it should be increased clinical facilities with the equipments and medicines, iv) supervision should be trained or supportive supervision v) specially community may be motivated to mobilize funds for maternal care services; vi) separation and identification of the roles of FWAs and SBAs to be considered; services of the SBAs need to be evaluated and their services to the community need to be properly rewarded.

149 Islam A. Challenges for the health system in Bangladesh. In: Bangladesh health system in transition: selected articles. Dhaka: BRAC University, James P. Grant School of Public Health, 2009. (Monograph series; no. 11).

This paper was written to review the health system in Bangladesh. Since the independence of Bangladesh it has made tremendous progress in health development. Now the arrange life expectancy at birth increased from 40 years in 1960 to 64 years in 2005. In 1971 our GNP was hardly $ 100 per capita but in 2006 it has increased to $480. Adult literacy rate increased from 24 in 1970 to 47 in 2006. The infant mortality rate (12 month or less during per 1,000 live births) in Bangladesh declined dramatically from 145 in 1970 to 52 in 2007. Similarly under-5 mortality

rate (under 5 children) declared form 239 in 1970 to 65 in 2007. Our 80% children are now immunized. Our total fertility rate (15-49 years) declined from 6.3 during 1971-75% to 2.7 by 2007. Needles to say our CPR also registered impressive grow from a low of 7% (percentage of married couples using modern method of contraception) in 1975 to more than 56 in 2007. A little progress has been confirmed in reducing malnutrition among children in Bangladesh. Thirty-percent people are being suffered from malnutrition at 320 per 1,00,000 live births. The maternal mortality ration also remains stubbornly high in Bangladesh. In 2000 only 12% of deliveries were done by skilled birth attendants and in 2007, it increased to 17.8% only. According to BDHS 2007, disparities between the rich and poor continue to persist in other areas too including malnutrition anemia during pregnancy among women, and the percentage of fully vaccinated children. The status of maternal health often acts as a litmus test for a health system. Since, science, religion, culture and social values intersect so profoundly on issues related to sex, pregnancy and childbirth. Perhaps the most critical challenge feed by the health system in Bangladesh is in the area of human resource for health. Most upazila health complexes suffer from inadequate human resource, especially physicians and nurses. As a result over publicly funded health care system is used by only 25% of the population, In the private sector, pharmacies clinics, diagnostic centers and modern tertiary care hospitals constitute the landscape for a robust for profit private sector in health. It is growing at a rate of 15% each year. Lack of progress in maternal health underscores lack of such an overabounding strategic frame work. Instead of looking at women's health from a life cycle perspective, our maternal health interventions mostly part of the population sector program, are proudly clinical in nature emphasizing availability of and access to emergency objective services.

150 Khan TI; Naher L; Akhter S. Assessment of maternal health care needs for safe motherhood and review of services provided in Bangladesh. Dhaka: NIPORT & BIRPERHT, 2008.

The study was designed to explore the perception and practice on prenatal care, high-risk pregnancy, and delivery by trained personnel, EOC and referral for complicated delivery and postnatal care of women in Bangladesh. Data were collected with structured questionnaire, from 12 Upazilla (Dhaka Sadar, Keraniganj, Manikganj Sadar, Singair, Bogra Sadar, Sherpur, Sirajganj Sadar, Chowhali, Comilla Sadar, Brahmanpara, Chandpur Sadar, and Kachua) of 6 districts (Dhaka, Manikganj, Bogra, Sirajganj, Comilla and Chandpur). The data collection period was February to April 2008. A total number of 4809 mothers (1706 pregnant mother and 3103 mother with child <1 year) were enrolled in the study and were interviewed by trained female interviewers. Respondents were identified by household listing and a structured questionnaire was used to collect data. The study findings revealed that women mean family size was 5.2 ± 2.3, the average age of the respondents was 23.8 years and the mean age at first marriage was found to be 16.7 ± 2.6 years. Still birth was found 4.1% in pregnant mother and 6% in mothers with child <1 year. The current contraceptive practice rate was found 56%. During ANC visit only 8% reported about the problem they faced. Nearly 70% reported for long wait, 50% for getting not well behave, 43% had to pay excess money to get health care and 38% for non availability of service providers. About 80% mothers have knowledge on danger signs of pregnancy and it was found higher among the mother with child <1 year compared to pregnant mother. It was also found that pronged labor 68.7%, edema 33.6%, convulsion 15.4%, abnormal presentation 15.3%%. Excessive bleeding 14.4%, fever 13.7%, and high blood pressure was 7.7%. About 91% women have some perception on birth planning and 9% had no knowledge. About 60% mothers had some planning for birth of their baby and 40% do not have any planning. Nearly 83% mother expressed their intention to delivery their baby at home and 14% wanted to deliver at health facilities.

Around 84% mother opined that adequate food intake is needed for mothers after childbirth, appropriate rest 39%, should not work hard after childbirth 37.3%, preparation for breast-feeding after childbirth 42%, and cleanliness after childbirth 26%. Treatment of any type of complication/sickness was mentioned by 30% mothers, 79% mother mentioned that more food is needed during breast-feeding, 66% mothers mentioned cleanliness and 35% mothers mentioned for care of breast and 26% mothers mentioned about treatment of any problem and 97% mothers breast feed their baby and only 3 % mothers did not. In the study around 90% mothers had knowledge on the causes of maternal dearth. Finally, the survey explored the rural mother's perception and practice of ANC, sage delivery, PNC and EOC. Therefore, the study suggested that awareness should be developed among the community people regarding the danger sign of pregnancy, birth planning, safe delivery practice, EOC services and referral system. All TBAs should be included in the ongoing SBA training program and mass media should be incorporated widely in the dissemination of safe motherhood messages.

151 Mahbub-ul-Anwar M; Rob U; Talukder MN. Inequalities in maternal health care utilization in rural Bangladesh. *International Quarterly of Community Health Education*. 2006-2008; 27(4): 281-297.

The article examines the inequalities in utilization of maternal health care in rural areas of Bangladesh. It also attempts to identify the expenditure pattern for these services. Information on maternal health seeking behavior and cost related to those services was collected from 848 ever-married women age 15-49 from two rural areas of Bangladesh. A single asset index was developed for all the households. According to the wealth quintiles, maternal health seeking behavior was analyzed. In addition, 24 in-depth interviews were conducted with women of reproductive age, service providers, and community leaders to understand the problems about maternal health care services, practices and money spent on these services. Moreover, six focus group discussions were conducted with field workers to identify the reasons for low utilization of maternal health care services. The study results revealed that two in three women in the highest wealth group receive antenatal care from qualified doctors as opposed to one in five women in the lowest wealth group. Almost all the deliveries occur at health facilities among the highest wealth group. Wealth is also associated with the seeking of care for delivery-related complications. The practice of seeking services during post-natal period is not common and it varies positively with economic condition. Family savings is found to be the dominant source of paying the maternal health care services among the women in the highest wealth group. Cost has been found to be the most commonly cited reason for not seeking care for delivery complications. Eighty-four percent of women in the lowest wealth group compared to 13% of women in the highest wealth group did not seek treatment for delivery complications due to cost. Lack of perceived need of antenatal care (ANC) and postnatal care is the most pressing reason for not seeking these services. Findings also showed that large disparities in the maternal health care utilization exist between the poorest and the richest population in Bangladesh. The study findings contain a number of implications for policy purposes that could be useful in devising ways to increase the utilization of maternal health care services.

152 Mutahara M; Rahman MM; Al-Sabir A. Creating a space for men and youth at Health and Family Welfare Centers in Bangladesh. Dhaka: Population Council, Demand-based Reproductive Health Project, 2009.

This operations research study was conducted under the DBRHCP to: i) create a space for male and youth at the Health and Family Welfare Centers (HFWC) without compromising services for

women & Children; ii) raise knowledge levels of unmarried males & females or RH issues and problem, including STIs & RTIs; and iii) increase utilization of RH services by male and youth from the HFWCs. A number of innovative interventions/strategies were designed and tested to achieve the study objectives, including: (a) improving technical knowledge and skill of the service providers; (b) strengthening infrastructure and the legation system of HFWC; (c) raising awareness of RH needs & services; (d) BCC interventions to increase awareness among youth and adult males regarding RH issues. The monitoring data showed that the community support groups (CSG) meetings were held regularly each moth to review the activities of the CSG members and the peer promoters, discuss problems relating to access to delivery of RH & FP services to the community & resolve problem locally, if possible. Knowledge about any modern contraceptive methods was almost universal during the survey among all population groups and remained unchanged. But knowledge about using condom us a means of preventing STDs & HIV/AIDS infection, in addition to using it as a method of family planning, increased significantly. Knowledge about maternal health care was also high for all population groups, and it was relatively higher for unmarried females. Awareness of the need for PNC at six weeks after delivery and of having a delivery conducted by skilled person both increased significantly. Improve the level of knowledge about RH issues and the availability of services for male and youth, but also its improved knowledge does not translate immediately into new practices; it requires a longer-period of time. It is anticipated that utilization of RH services by male and youth will gradually increase provided a conducive environment at HFWC can be ensured.

153 Rahman SM; Ali NA; Jennings L; Seraji MHR; Mannan I; Shah RZ; Mahmud ABA; Bari S; Hossain D: Das M; Baqui AH; Arifeen SE; Winch PJ. Factors affecting recruitment and retention of community health workers in a newborn care intervention in Bangladesh. *Human Resources for Health*. 2010; 8(12): 1-24.

This study was written to explore the causes of attrition, as well as how CHW attrition was analyzed and addressed by this community-based newborn care intervention in rural Bangladesh. The study also investigated reasons for high rates of CHW attrition in Sylhet District in north-eastern Bangladesh. Sixty-nine semi-structured questionnaires were administered to CHWs currently working with the project, as well as to those who had left. Process documentation was also carried out to identify project strengths and weaknesses, Which included in-depth interviews, focus group discussions, review of project records (i.e. recruitment and resignation), and informal discussion with key project personnel. The study results showed that motivation for becoming a CHW appeared to stem primarily from the desire for self-development, to improve community health, and for utilization of free time. The most common factors cited for continuing as a CHW were financial incentive, felling needed by the community, and the value of the CHW position in securing future career advancement. Factors contributing to attrition included heavy workload, night visits, working outside of one's home area, familial opposition and dissatisfaction with pay. The framework presented illustrates the decision making process women go through when deciding to become, or continue as, a CHW. Factors such as job satisfaction, community valuation of CHW work, and fulfillment of pre-hire expectations all need to be addressed systematically by programs to reduce rates of CHW attrition.

154 Talukder MN; Rob U. Health systems and maternal mortality, neonatal mortality and child health: review of selected service delivery models. Dhaka: Population Council, 2007.

This study was conducted to identify the health service delivery models, which have contributed to the reduction of maternal, infant and child mortality in five selected developing countries, and also to identify the strengths and limitations of these models. The study was conducted to identify successful service delivery models in the area of maternal and child health which were implemented in the recent past in five selected countries. The countries studied are Bangladesh, Cambodia, Pakistan, Ghana and Tanzania. In addition, relevant materials on the health system and health policies with particular reference to maternal and child health of the selected countries were reviewed. This study was conducted to collect by population council funded by CIDA. In many developing countries the health systems cannot provide quality maternal and child health care services due to lack of adequate and appropriately trained human resources, chronic shortages of equipment, drugs and basic supplies, and the absence of proper referral mechanisms. The community health volunteer model in Bangladesh demonstrates that appropriately selected and trainee community members can deliver basic health services including maternal and child health services at the doorstep. Experiences from the Maternal and Child Welfare Center strengthening project in Bangladesh indicate that training of the service providers and upgrading facilities are required to provide safe motherhood services including comprehensive emergency obstetric care effectively in rural areas. The major strength of these service delivery models is their community base health care approach. Implementation of these models demonstrates some significant achievements fundamental to reducing maternal and child mortality and morbidity. They are: capacity building which includes training of service providers and recruiting and training community health workers/volunteers; strengthening service delivery systems including upgrading facilities, developing local level evidence-based planning. The strengthening health service delivery systems with skilled and motivated health workers are the essential and integral part of community-based health care services. It can be extend the targeted maternal and child health services in the areas where health services are hard to access.

2.6 BEHAVIROAL CHANGE COMMUNICATION

155 Islam SMS; Chowdhury AH. Patterns of family planning behavior in a rural area of Bangladesh: a stochastic model approach. *South Asian Journal of Population and Health*. 2008 July; 1(2): 125-135.

The study was undertaken to determine the patterns of family planning behavior in rural Bangladesh among 1060 couples in a rural area of Bangladesh based on information collected during the period between January 2001 and December 2004 within a stochastic model approach. The transition probability matrix formed by considering various contraceptive methods jointly with parity levels shows that majority of couples are not likely to change their current parity levels in a short period and continue to use their current methods of contraception. It has been found that at the lower parity levels current non-contraceptors are not likely to use contraception to bear more children and oral pill users are expected to use pills to achieve desired space between births whereas the users of other temporary contraceptive methods are likely either to switch to pill in order to delay births or stop using contraceptives to attain desired family size. At higher parity levels, couples are found to have a tendency adopt sterilization in order to limit family size at four or five children. The proportions of multifarious couple using temporary birth control methods generally decrease in favor of contraceptive sterilization with the passage of time. This may be explained by the fact that the couples are reluctant to take risk by adopting temporary methods of birth control after building a desired family size.

2.7 MANAGEMENT INFORMATION SYSTEM (participatory management, registration, record keeping, monitoring, supervision, etc.)

156 Anonymous. Different field monitoring guidelines and instruments for monitoring. Dhaka: NIPORT, DBRHC Project & TRK Consultancy Services. 2007.

The main objectives of the activities were to develop field monitoring guidelines and instruments in order to monitor implementation of the work plan and make comparison between planned; to actual production of deliveries and; to help facilitate timely reporting to stakeholder. TRK Consultancy Services designed the work plan on the basis of the TOR, which was revised later on after discussing with the organizations. Plan was developed in such a way so that it ensured the availability of the relevant government officials as well as other members especially people from the relevant organization/implementing partners. They had meeting with the concern organizations, NIPORT and UNFPA representatives at the beginning of the work. The government of Bangladesh (GOB) has increased its investments in education health, food security, and other social services, thus helping reduce poverty by 1% per year, and plans to reduce the incidence poverty by 50% by 2015. It has progressed significantly in the past decade. It has achieved self-sufficiency in rice production, lowered infant and child mortality rates, virtually eradicated polio, increased girls' environment in schools; and annual GDP growth has averaged about 5% for ten years. Over the last 30 years there has been a substantial improvement in the health status of the people. Life expectancy at birth has increased to 60.8 (1998), CDR has declined to 4.8 (1998), and TFR reduced from 6.34 (1975) to 3.3 (1999). Suggested monitoring instruments are: a) field observation monitoring instruments, b) deliverable monitoring instruments, c) monthly project status update, d) quarterly project report, e) field monitoring visit report, f) annual work plan, and g) other monitoring instrument. Expected results are: a) instruments for monitoring the DBRHCP activities conducted by different implementing partners; b) guidelines for using monitoring instruments. To use the indicator effectively we need to understand the meeting of monitoring and indicator. Monitoring generally refers to the routine tracking of the projects on going activities, achievements and constraints. It helps to ensure that activities are carried out as planned. It answers the question: Indicator of project/programs is identified from input to impact level. It is a numerical measure that provides information about a complex situation or event. It is hoped that this document will be a useful tool for the implementing partners in general and NIPORT in particular to monitor the Demand Based Reproductive Health Commodity Project in a qualitative manner. The government is aware of this situation and the shortcomings that need to be addressed.

157 Haider SJ; Choudhuri SR; Sultana N; Giash-uddin MS; Chowdhury SS. Assess the utilization of MIS and reporting forms in FP MC-RH. Dhaka: NIPORT & READ, 2010.

The broad objective of the study was to assess the utilization of MIS and reporting forms in FP-MCRH. The study followed a cross sectional statistical design. An integrated approach combining both quantitative and qualitative household survey and qualitative in-depth investigations were applied for data collection. The study was conducted in all the six divisions. From each division, two districts, from each districts two upazilas and from each upazila one union were randomly selected. For quantitative survey, the study covered 1440 (100%) eligible couples and for qualitative investigation, 203 program personnel were interviewed. The findings showed that a review of the indicators currently used in the FWA register (6^{th} edition) and in the reporting formats of FWA, FPI and Upazila showed the FWA register has now 255 indicators under 16 different sections; FWA monthly progress report has 130 different indicators. Similarly, the union

or FPI progress report has got 156 indicators. It appears that there exists a huge recording and reporting burden at the field level. Field functionaries, especially, the FWAs can be relieved of the recording load. Some of the baseline statistics can be recorded by FPI or TFPO. However, some developments over the last several years have adversely affected MIS functioning. The problems, the discrepancies and some deficiencies identified in this study are due to both structural and policy changes and systemic human errors. Among the problems identified through the study are the existence of huge number of indicators, large number of reporting for clinical services, absence of skill training, lack of supervision, guidance and shifting of responsibilities in target setting for FP-MCH, inadequate use of MIS information for performance review and monitoring etc. The study recommended that measures should be taken to fill up to the vacancies in FWA cadre and narrow down the worker population ratio to 500-600 couples as recommended. An immediate training program should be organized for the MIS personnel from top to bottom level of personnel working in the FP program.

158 Halder SJ; Choudhury SR; Sultana N; Gias-uddin MS: Chowdhury SS; Nashir-uddin. Asses the utilization of MIS and reporting forms in FP MC-RH. Dhaka: NIPORT & READ, 2010.

The broad objective of the study was to asses the utilization of MIS and reporting forms in FP-MCRH. The study followed a cross sectional statistical design. An Integrated approach combining both quantitative household survey and qualitative in-depth investigations were applied for data collection. The study was conducted in all six divisions. From each division, two districts, from each district, two upazilas, from each upazila one union were randomly selected matching the performance level (CPR-2007, BDHS) of the respective division. Interpersonal interview with eligible couple (wife) were conducted at household level. Findings of the study showed that a review of the indicators currently used in the FWA register (6^{th} edition) and in the reporting formats of FWA, FPI and Upazilla shows the FWA register had now 255 indicators under 16 different sections; FWA monthly progress report has 130 different indicators. Similarly, the union of FPI progress report has got 156 indicators. Contraceptive performance and MCH report is published each month from MIS Unit on the basis of Service Statistics (SS) received from the field workers, service delivery clinics and NGOs. FWA register, however, is the principal source of performance statistics. This report is prepared on the basis of FWA registers. There is report system to collect information from the field. MIS form no. 1 is filled up by the FWA who submits the same to FPI. FPI fills up the MIS reporting form – 2 by compiling of all the FWAs (Form-1) report and submits to UFPO office. Forms on recording of births are primarily used by the FWAs, who particularly record the events of births and deaths, including still births. On recording of contraceptive use, the FWAs record about all methods except injectable in the columns provided in the register, while for injectable they use separate forms. On the question of quality of MIS system the field workers and their supervisors opined that overall MIS system was satisfactory. They mentioned that there was a good arrangement for quality recording in the registers. MIS was started as a distinct until in 1979 with required manpower and technical assistance from the donor groups. In this study a mini-computer system-34 was installed in early 80's to process performance statistics. Under Health, Nutrition and Population Sector Program (HNPSP) MIS Unit of Directorate General of Family Planning (DGFP) consists of three major sub-systems; such as: a) Service Statistics (SS) on FP-MCH, b) Logistics Management Information System (LMIS) and c) Personnel Management Information System (PMIS). MIS unit has been implementing a developed record keeping and reporting system since 1980. It has a unique system of longitudinal data recording at the household level through the FWA register on FP-MCH services. Among the problems identified through the study are the existence of huge

number of indicators, large number of reporting for clinical services, absence of skill training, lack of supervision, guidance and shifting of responsibilities in target setting for FP-MCH, inadequate use of MIS information for performance review and monitoring etc. The recommendations, given in the study report, hopefully, would go a long way to resolve the current problems and deficiencies and would ensure improved efficiencies (better functioning) and effectiveness (result based quality outcome) of the MIS system.

159 Haider SJ; Sultana N; Islam N; Chowdhury SS; Rahman H. Effective use of FWA registers/forms in record keeping and reporting. Dhaka: NIPORT & READ, 2007.

The broad objective of the study was to evaluate the effective use of FWA register in record keeping and reporting. The study followed a cross-sectioned statistical design. An integrate approach combining both qualitative and quantitative methods was adopted to conduct the study. The study covered sample eligible couples in the selected 12 units of high and low performing areas. From six divisions, 12 FWA units, 6 high performing and 6 low performing units were selected for the study. The findings of the study revealed that slight difference (of 1-2 years only) on the mean age of the wives both for high (30-31 years) and low (29-30 years) performing units and also for the husbands both for high (37-39 years) and low 35-36 years) performing units have been observed between the data obtained through survey and those in the FWA Register. It is indicated that one-third of the FWAs start their day's work by 8.40 a.m., while the rest two-thirds starts their day's work around 9 a.m. One-third of the FWAs complete their work by 4 to 5 p.m., while little less than half (42%) complete their field work by earlier, i.e. 3.40 to 4 p.m., but a third continue the field work as late as 6 to 7 p.m. Little less than half (42%) of the FWAs cover on an average 10 to 18 households in a day. FWAs conduct their schedule of home visits as per planned targets of households abiding (all but one) by the serial numbers of the couples listed earlier. FWAs also confirmed that they had been completing their round of visits to household within their assigned units as per schedule of time: for some once a month and for some once in 2 months as fixed in the programs. Analysis of data showed that those FWAs (4 out of 6) from high performing units complete visitation in 2 months each visit on average 28 household per day, while those who complete the records in one month, visit 33 household a day. It is surprising that on the practices of recoding data in the FWA Register only 50% did it appropriately and fully, while 42% did it partly and 8% failed to do so. FWA Register maintains an acceptor based performance record for all methods- permanent, long term and temporary methods as against distributive statistics for condoms, oral pills and injectables generated in the earlier system. FWAs were using the register to record the events of service delivery made at household level in respect of family planning, maternal child and reproductive health. Reports on contraceptive acceptance/performance (oral pills, injectables, IUD and female sterilization) for the month of April 2007 were checked and the discrepancies were identified. Discrepancies at FWAs and FPIs level: for high performing units ranged between 0.21 to 1.88% for all other methods except injectables, which was 13%. The study suggested that it is essential to record the service statistics of FP i.e. recording on side effects, drop out, MC & RH components etc. for future plan of action, if MIS on FP-MCH and RH may be established as a complete operating system. The need is to immediately appoint a professional/technical committee to assess the recording and reporting needs striking a balance between the two survey findings of BDHS should be disseminated within a integrated manner by arranging a dissemination seminar with the stakeholders, planners and policy makers, so that they could be aware about the program performance, programmatic constraints and deficiencies (through MIS).

160 Molla AA; Hossain MM. In-depth monitoring of maternal child and reproductive health services delivery program. Dhaka: IMED, 2010.

The main objective of the assignment was to conduct in-depth monitoring and as well as evaluation of all the activities undertaken under the program "Maternal, Child and Reproductive Health Services Delivery". Data were collected from 6 districts, 24 Upazillas and 48 Union facilities (FWCs). In-depth interviews were conducted with 94 service providers. Besides, a total of 791 exit clients were interviewed. The study results revealed that the main achievement of MCRH Program is the contraceptive acceptance rate (CAR). Majority of the sample district (5 out of 6) have achieved more than 70% CAR. Only Laxmipur district achieved 66.3% CAR. It is worth while to note that Sirajgnaj. Moulavi Bazaar and Kushtia have achieved more than 75% CAR. During data collection, there was no supply of items like Sharee, Lungi. Most important is to note that there was shortage of supply of IUD (Copper-T) in Laxmipur, Moulavi Bazaar and Madaripur. Moreover, there was occasional shortage of implant and injectables. In majority of the sample districts and upazilas , 100% of pregnant women and women of reproductive age have been covered. As reported from the district and upazilas 55.4% of the facilities have covered of the targeted deliveries. Institutional deliveries are still less than 30% of the total deliveries. As the record says, PNC coverage is only 40% of the targets. In the entire sample MCWCs, there are 100% provisions of adolescent health care including counseling, RTI/ST treatment. 98% of the service recipients are women and the majority of the services they seek are FP advices (43.9%). Mothers' care (29.3%) is the second highest purpose of visiting the facilities. In some areas good cooperation and collaboration exist among health and FP personnel. As opined by FWAs, all of them (100%) assisted in EPI and NID programs, but it could not be properly done. Sometimes, mobiles are being utilized for supervision. The overall supervision system is good, but due to shortage of manpower and transport, it could not be properly done. Management and accountability system of the MCRH program is good. The supply system must be re-arranged and procurement monitoring needs to emphasized and strengthened. Supplies must be according to the eligible couples and utilization rate. The shortage of manpower needs to be filled up as soon as possible. Necessary vehicles must be procured within a short period to strengthen the monitoring & supervision system.

2.8 MCH-FP PERSONNEL EVALUATION (training, human resources development, performance of the workers, etc.)

161 Anonymous. Job satisfaction of field level officers and staffs working under DGFP. Dhaka: NIPORT & GUS, 2010.

The purpose of this study was to assess job satisfaction of field level officers and staffs work under DGFP. The study followed a cross sectional statistical design. An integrated approach combine with both qualitative and quantitative methods were adopted to conduct the study. Interview and focus group discussions were initiated to obtain study information. In addition, available secondary data were analyzed for the purposes. Four categories of family planning program personnel were studied like FWV, SACMO, FPI and FWA. For the study in total 576 field level officers and staffs (144 program managers and services providers0 work under DGFP were selected and successfully interviewed. The study findings revealed that majority of the respondents have long service experience and most of them were familiar with their job description. A vast majority of them tries to carry out their duties according to their job description but in certain situation they failed to perform their regular responsibilities as they have to perform work beyond their assigned job. Many of the service providers were involved with NID (99.1%), diarrhoe and measles campaign (79.4%), arsenic program (80.7%), EPI program (21.1%), and observance of different national /international days (17.5%). Most of them provide MCH services (86%), distribute FP method (51.1%), involved with health education (45.5%). Provide treatment to general patients (42.8%), provide ANC, PNC and delivery services (22%) and help the patient to get services from community clinics (17%). Program managers also were involved with various activities that includes visitation of FWCs or Satellite clinics (95.8%), supervision of FPI, FPA (47.9%), monitoring and supervision (44.8%), motivational campaign. They also pay visit to households to meet family planning acceptors during their field visit. During their visit most of them were involved with counseling services. The provide assistance to the field workers in motivational work by organizing monthly/weekly meeting The study findings indicated that more than one fifth of the respondents faced limitation to perform their responsibilities. Shortage of necessary medicine, shortage of trained and skilled manpower, insufficient supply of family planning methods, failed to maintain privacy of the patients were the limitations that program managers have to face in performing their responsibilities. Most of the respondents showed dissatisfaction with their job for unhealthy working environment, shortage of logistics and necessary medicines, insufficient TA/DA, limited scope for further promotion, less opportunity for training. The study recommended that DGFP lacking skilled and trained manpower at the field level. It also showed that officers and staffs of field level were overloaded with their works. So, it is suggested that more trained and skilled manpower should provide appointment and provide increase incentives to run the family planning program smoothly.

162 Anonymous. Identify the barriers of keeping the FWVs/SACMOs in their work situation/station. Dhaka: NIPORT and IDRF, 2007.

The principal objective of the study was to assess the problems and factors that influence the FWVs and SACMOs for not residing at the UHFWCs and find out the ways to encourage the FWVs and SACMOs to stay at their work station full time. Multistage stratified cluster sampling design was undertaken for the study. The samples were selected systematically with a random start. In all, a total of 48 Union Health and Family Welfare Centres (UHFWCs) were selected from 6 divisions of the country. From each selected cluster, 5 clients, 5 non-clients and 5

community leaders along with FWVs and SACMOs were selected for interview. FGD was held in one UHFWC of each of the 12 Upazillas. The enumeration was done for 7 days with close an independent supervision. The study findings revealed, out of 48 UHFWC, only one did not have any FWV but three have two FWVs each. In case of SACMOs 16 UHFWVs did not have any SACMO. Thus, a total 51 FWVs and 32 SACMOs were interviewed. The study showed that physical condition of 66.7% of the buildings are good, 4.2% are tin shed with rusts and holes, 16.7% are partially fractured/damaged and 12.4% need repairing/servicing. According to FWVs, the main reason for not staying at the staff quarter is absence of security wall and security guard (90.4%) which is followed by no schooling facility for children (77.0%), no water supply (76.6%), working place of spouse is different (73.1%), no electricity (71.2%). According to SACMOs, the main reason for not staying at the staff quarter is not schooling facility for children (83.9%) which is followed by no security guard (80.7%), no security wall (80.7%), no water supply (80.7%) infrastructure deteriorated (71.0%) isolation of UHFWC from the locality (61.3%). While analyzing the response it was observed that 1.8% of the clients have unmet demands or treatment and services, 1.4% have unmet demands or good behavior and about 1% have unmet demand or timely services. Equal number of non-clients told about the main reason for not coming to the UHFWC was good services not obtained (60.6%) which is followed by essential equipments and medicines are not available (50.7%). FWVs are not found in the center (35.3%), SACMOs are not found in the center (30.3%) etc. According to the concerned Medical Officer 75.0% of FWVs and SACMO, according to Family Planning Officer 83.3% of FWVs and SACMOs and according to FWVs, 78.0% of FWVs and SACMOs were found in the work stations during their official visit. According to community leader's interview in keeping the FWVs and SACMOs in their work station is absence of security wall and guard (58.2%), non-supply of electricity, safe drinking water (42.9%), isolation of staff quarter from the locality (34.7%), working place of spouse is different (24.7%), staff quarter is damaged - not habitable (20.6%). The study suggested keeping the FWVs and SACMOs in their work place that renovation of infrastructure of the staff quarter with security wall should be made immediately. Appointment of security guard, supply of electricity, safe water supply, sanitary fittings and toilets, posting of spouse in the nearest place, stay in the quarter obligatory recruitment of FWVs and SACMOs a fresh from locality, incentives/family allowance, foreign training of FWVs/SACMOs, transport facilities and last of all their promotion system should be confirmed to keep them in the work station.

163 Anonymous. Capacity building of service providers. Dhaka: RTM International and NIPORT, 2008.

The overall objective of the training was to strengthen the capabilities of service providers at upazila, union, ward level on reproductive health so that the community people can avail quality services from service delivery points according to their needs. RTM International undertook the following training programs-Training of Trainers (TOT) courses, training on "FP,RTI/STI and counseling" and training on maternal health for the service providers and field workers of project areas. The service providers in project areas of DBRHCP have been trained on issues related to reproductive health services. The service providers who received training on family planning are putting in their efforts in increasing the rational use of modern FP methods and thus increasing the contraceptive prevalence rate (CPR) in their working areas. RTM International has conducted trainee follow up and onsite mentoring of the service p providers at project areas of DBRHCP which ensured the effectiveness of the trainings. These trainings resulted in improvement in the provision of reproductive health services in the project areas. Service providers recommended for

filling up the vacant posts of UHFWCs. To develop team spirit orientation of the entire staff of the centre is essential. This type of activity needs to be arranged at least two times in a year.

164 Anonymous. Qualitative assessment of family welfare visitors and others (FWA, HA) in Bangladesh. Dhaka: MOHFW, HRD & BIRPERHT, 2009.

The specific objectives of the study were: i) to evaluate the existing training programs for the FWVs; ii) to ascertain the job satisfactions of FWVs and others; iii) to identify the strengths and weaknesses of the training institutes; and iv) to explore their demand and supply for implementing "comprehensive long term human resources for health master plan (2010-2040). A combination of both quantitative and qualitative methods was used to conduct the assessment of this study. Here, a postal survey method was used to obtain quantitative data from FWVs, FWAs and Has, faculty members of both FWVTIs & RTCs and key informants to obtain qualitative data. Data was collected from a sample that was determined through a semi-purposive method. The study findings showed that there is a broad agreement among the trainers and managers of concerned training institutes about the general inadequacy of the existing training programs for the FWVs. The reasons behind the main adequacy of training as mentioned by the respondents include lack of gender awareness in the training program, insufficient fund and lack of properly qualified trainers, lack of evaluation system, inadequate emphasis on practical training. The majority of the respondents were in full agreement that the FWVs needed substantial in-service training in order to increase the effectiveness of their services of the community. In the current curriculum there are no topics on management of emerging and re-emerging diseases, motivation primary health care, campaign health education, duration of midwifery training is short, training evaluation procedure is inadequate, there is also scarcity of accommodation Facilities, lack of skilled trainer and training material. The duration of FWV training course should be increased since there is a demand of treating them equal to diploma holders; Midwifery trading should be one year course; to develop and retain skilled manpower in the health and FP sector, there should have better opportunity for career planning and development.

165 Anonymous. Report on qualitative assessment of nursing institutes in Bangladesh. Dhaka: BIRPERHT, 2009.

The objectives of the study were: i) to explore the existing institutional facilities including in terms of technical, educational and the facilities; ii) to investigate the job satisfaction of nursing profession; and iii) to find out demand and supply of the nursing institutes for implementing comprehensive long term human resources for health master plan. The study was carried out in 54 nursing institutes and colleges in Bangladesh both govt. and private, 38 was govt. and 16 were private. The primary data were collected through self administered structured questionnaire. Fifty-four faculty members, 19 trainees; 10 key informants and 8 focus group discussion participants were included in this study. Regarding training period, 68.4% nurses opined that the training period was adequate and the rest did not think so. They also suggested for residential facilities, 60% faculty members opined that current evaluation procedure is not enough while rest (40%) commented as enough. On future curriculum, 55.1% opined to include modern subject & up-to-date technology. During execution of training program, 56% faced problem due to shortage of subjective and skilled teacher. Regarding the available training materials, 98% respondents mentioned for Book/Journal as main training material, next mole/doll (59%). Among the other materials 90.7% reported white board, chalk, black board, transport (46%), skeleton (44%), overhead projector, slide project, multimedia (91%), computer/lap top/internet/e-mail (26%) and flip chart (78%).About present nursing training program, 63% opined it as good and 37% for

medium,. Regarding future steps for upgrading the quality of nursing profession, 50% opined for need of modem and upgraded training system with materials, give priority of merit, qualification and skills, 38% for provision of quality training both teachers and students. Steps should be taken for image building of the nursing profession to accommodate talented and committed students. For the development of health human resources, emphasis should be given of access to equal salary and incentive and scope of promotion. Provision of basic and refreshers training for trainer should be confirmed.

2.9 WOMEN IN DEVELOPMENT (gender issues, domestic violence, women role in decision making, mobility, etc.)

166 Alam N; Roy SK; Ahmed T. Sexually harassing behavior against adolescent girls in rural Bangladesh: implications for achieving millennium development goals. *Journal of Interpersonal Violence.* 2010; 25(3): 443-456.

The objective of this study was to asses the levels and differentials in the types of sexually harassing behavior that never-married adolescent girls experienced on the way to school, college or social visits in rural areas of Bangladesh. The study used data of the 2004 National Nutrition Program baseline survey. The baseline survey followed a two-stage random cluster sampling to select respondents. The survey collected self-reported data on sexual harassments of 5106 girls aged 13-19 years selected randomly. Results of the survey revealed that gendered harassments were experienced by 35% of the girls, unwanted sexually attentions by 34%, and sexual intimidations by 14%, yielding prevalence of sexual intimidations by 14%, yielding prevalence of sexual harassments of any type 43%. Higher girls' education and household economic status heightened their risks of being harassed. Perpetrators were male young spoilt bullies (64%), neighborhood youths (30%), students (22%) and hoodlums (6%). High prevalence of sexual harassment mirrors vulnerability of adolescent girls in the community and deserves to be tackled to achieve millennium development goat (MDGs) in gender equality in health and social development. Approaches can be raising mass awareness and changing gender-biased mindset and behavior of young men. School authority and civil society can play supportive roles in changing mindset and ending general violence against girls in education A great deal of operational research work may be needed in the areas of behavior change communication.

167 Anonymous. Gender based violence and discrimination towards women and girls. Dhaka: NIPORT, UNFPA, Bangladesh, Eusuf and Associates, 2008.

The study was designed to assess the nature and extent of the problems related to gender based violence, analyze the pattern of violence in family and individuals, to assess men's attitude towards women in general and their attitude towards gender based violence and identify interventions to stop violent behavior of men or family members towards women and girl. The study consisted of standardized population based household surveys conducted in all 18 Upazillas one urban (Sadar) site and two rural sites (one upazilla near the town and one further away). Work was coordinated with a research team of 3 national experts assisted by 16 research assistants (12 in the filed and 4 in reserve). Because a significant proportion for the respondents were males, six male and 6 female research assistants were selected and provided with 2 days of intensive class room orientation and 5 days on the ground practice in administration of the instruments. Because of the sensitive nature of the subject matter each research assistant was walked through the questionnaire several times to clarify the issues and refresh their techniques of proving for answers. Role play was used to accustom them in using words with sexual connotations with total strangers. The results indicated that violence by a male, usually the husband (also called domestic violence) is widespread in all the sites included in the study. Some variations became visible from site to site and from setting to setting indicating that this violence is not inevitable. The proportion of currently women who had ever suffered physical violence by the husband ranged from 11% in Barisal to 67% in Cox's Bazar. The prevalence of severe physical violence (a woman being punched, kicked, pulled by the hair, have household items thrown at her and be physically thrown out of the marital home) ranged form 11% in Gazipur to 17% in Barisal. The range of lifetime prevalence of sexual violence by the husband was between 5.6% in Sylhet and 17% in Pabna.

Side discussion with ever married women showed that the range of lifetime prevalence of physical or sexual violence, or both, by the husband was 30% to 85%. Regarding current violence as defined by one or more acts of physical or sexual violence in the post 1 week prior to being interviewed -the range was between 94% in Pabna and 17% in Barisal, with sites falling between 20% and 40%. Across all sites between 20% and 60% of women had experienced one or more of these acts, most within the past week. In all the sites at least 5% of the women reported that their first sexual experience as forced, with more than 50% reporting forced first sex in Sylhet. Where only marriage is practiced religiously, high levels of forced first sex are likely to be related to early sexual initiation in the context of early marriage, rather than being by perpetrator other than partners. The prevalence of injury among women who had ever been physically abused by their husband ranged from 11% in Bagerhat to 44% in Barisal. The proportion of ever pregnant women physically abused during at least one pregnancy exceeded 33.3% in Cox's Bazaar. The range set was between 5.6% in Gazipur and 39% in Cox's Bazaar. Respondents firmly believed that a woman has a right to refuse to have sex with her husband in a number of situations, including: if she is sick, if she does not want to have sex, if she is drunk, or if she mistreats her. Between 30% and 90% of the men believed that woman had no right to refuse sex. Almost all the physically abused women said that they had never sought help from formal services (health services, legal advice and shelter) or from people in positions of authority (police, women's non-govt, organization (NGOs) local leaders, and religious leaders). Because they think that they had disclosed family matters to outsiders. In keeping with their responsibility for the well-being and safety of their citizens, national governments, in collaboration with NGOs, donors and international organizations, need to strengthening committee and social services to support abused women and a crucial step in encouraging women to seek help before the abuse becomes life threaten. Moreover, it should reduce the social stigma surrounding violence, and to strengthen informal networks of friends, relatives and neighbors that women turn to for support and to gather detailed and reliable information on the prevalence, nature and causes of gender violence in the given context.

168 Asling-Monemi K; Naved RT; Persson LH. Violence against women and the risk of fetal and early childhood growth impairment: a cohort study in rural Bangladesh. *Arch. Dis. Child*. 2009; 94: 775-779.

The aim of this study was to analyze whither different forms of family violence (of which intimate partner violence represents > 75%) against women is associated with impaired size at birth and early childhood growth. The longitudinal study design, the community based sample, the assessment of potential confounding factors, and the sample size of more than 3000 live births followed for 2 years provide unique possibility's for studying the potential effects of violence against women on the growth of their offspring. A sub study embedded into community based food and micronutrient supplementation trial of pregnant women in rural Bangladesh included 2 year follow-up of the 3164 live born children of participating women. Anthropometric data were colleted from birth up to 24 months of age, and converted to WHO growth standard SD scores. Size at birth and early childhood growth were assessed in relation to women's exposure to physical sexual and emotional violence and the level of controlling behavior in the family. Results of the study revealed that fifty percent of all women reported a lifetime experience of some form of family violence. The mean birth weight was 270 g. 30% were low birth weight (<2500 g), mean birth length was 47.5% cm (17.5%, <2 SD) and at 24 months of age 37% were underweight and 50% of the children were stunted. Exposure to any form of violence was negatively associated with weight and length at birth and weight for age and height for age SD scores at 24 months of age, as well as a change in weight and height SD score from birth to 24 months of age ($p<0.05$,

adjusted for potential confounders). Impaired growth velocity i.e. changes in mean height/length-for-age (HAZ) Z scores from birth to 24 months of age, was significantly more pronounced ($p < 0.05$) for children of mothers exposed to any violence, but also for children of mothers exposed to lifetime physical and sexual violence or a high level of controlling behavior in marriage. In the concluding line may be drawn that violence against women was associated with an increased risk of fetal and early childhood growth impairment, adding to the multitude of confirmed and plausible health consequences caused by this problem.

169 Asling-Monemi K; Naved RT. Violence against women and the risk of under-five mortality analysis of community based data from rural Bangladesh. *Acta Paediatrica*. 2008; 97: 226-232.

The purpose of this analysis was to asses whether different form of violence against women were associated with increased mortality risks of their offspring before 5 years of age and to evaluate whether such associations, if present differed with mothers socioeconomic status and gender of child. Data were linked from two different sources containing information on the same population of reproductive aged women: a survey on women's health and domestic violence against women and longitudinal data from Health and Demographic Surveillance System (HDSS). Secondary data analysis was done from rural Bangladesh of 2691 live born children in relation to their mother's experience of physical sexual and motional partner violence and level of controlling behavior in marriage. Analysis were adjusted for potential conformers and stratified by gender. The researchers found as a result that under-five mortality was 88 per 100 in this cohort. Overall, there was no association between different forms of violence against women and under-five mortality. However more educated women had an increased risk of under five deaths of their female offspring if over exposed to severe physical violence (adjusted hazard ration 2.2, 95% cl 1.06- 4.50) or to a high level of controlling behavior in marriage (adjusted ration 2.5, 95% cl 1.30-4.90) controlling behavior in marriage increased the hazard rations in a close response manner. Increased mortality risks were neither shown for offspring of women with low or no education nor for boys in any educational group. Therefore severe physical violence and controlling behavior in marriage were associated with higher under-five mortality among daughters of educated mothers in rural Bangladesh, indicating gender-based consequences of partner violence for child mortality. From the study findings, it may be suggested that further research is needed to confirm this findings and to evaluate explanatory pathways on how violence against mothers is affecting child care leading the precarious effects especially on small girl's health and survival. Intervention aimed at protecting girls from discrimination and women from all forms of violence urgently need to be initiated or reinforced.

170 Haider SJ; Ferdous S; Abedin MN; Islam MN; Chowdhury SS; Rahman H. Dowry and discrimination towards women and girls. Dhaka: NIPORT, UNFPA Bangladesh and READ, 2007.

The objective of the study was: i) to analyze the various types of discrimination or violence against women and girls as a result of dowry; ii) to analyze pattern of discrimination or violence; iii) to assess men's attitude towards women in general and their attitude towards dowry in particular; iv) to assess the attitude of family members including in-laws towards dowry; and v) to find out ways to stop violent behavior of men towards women. An integrated approach combining both qualitative and quantitative method was adopted to conduct the study. In-depth interviews, case studies and focus group discussions were conducted to obtain study information. Data were collected from eight sample spots from six divisions, eight districts and eight Upazilas. The spots

comprised 2 urban sites (slums in cities) and six rural areas. The rural spots (mouzas) were selected using stratified random sampling approach. Majority of the wives (61%) are within age 20 to 29 years and the rest are within ages 30 to 39 years (26%) and 40 years or above (5%). Most of the husbands (67%) are within ages 20 to 39 years, while a third of them are 40 years or above (33%). The study found the different type of tortures like: severe tortures; throwing acid, setting fire to harm the victims, inflicting injuries on the body, coerced sex or without consent, homicide; less severe tortures: slaps, mild beating, kicks; and mental tortures: using abusive words and harsh comments, creating constant mental pressures for dowries, threats of divorce, denying financial rights, denying food etc. As regards 'severe tortures, 41% of the sample of housewives tortured, (direct personal experiences), 38% of the sample of husbands (torturing wives) and only 19% of the sample of other adult male members (torturing wives), affirmed experiencing the same, while their perceptions (awareness) about the types of severe tortures persist at universal level (100%). The major reasons in order of priorities (frequencies of mention) are: default on payments of dowry 100%; personality factors 78%; behavioral and cultural factors 67%; different pleas 51%; socioeconomic factors 45%; and sexual deficiency factors 9%. Major reasons for payments of dowries are: physical appearance/attributes of brides: Husband 87%, other adult male members 70%, tortured housewives 75%: daughter not good looking/complexion black; relatively older age of the bride; and brides, physical weaknesses. About a quarter of the respondents mentioned sexual harassments (27%) and undermining rights to employment (24%) as forms of discriminations to the women. According to the FGD participants, the community holds negative views about the victims of tortures (100%); particularly none would marry or be sympathetic with victims of rape (17%). Hardly a quarter of the respondents: father-in-laws (26%), mother-in-laws (25%), sister-in-laws (25%) and brother-in-laws (21%) mentioned about incidents due to dowry in the family. Last of all, dowry is anti religious and un-ethical creates sense of guilt (6%), and children are spoilt observing fights/quarrels between parents (4%). The study recommended some measures that shall be taken into consideration like; i) punitive action against dowry offenders; ii) social mobilization; creating social/community pressures and change behaviors; iii) raising awareness on adverse consequences of dowry tortures; iv) empowering women; foster gender quality; v) strengthening the institutional after care for the victims and social rehabilitations; and vi) long term actions; raise literacy and reduce poverty.

171 Islam A. Combating violence against women: need for a radical new perspective In: Bangladesh health system in transition: Selected articles. Dhaka: BRAC University, James P. Grant School of Public Health, 2009. (Monograph series; no. 11)

This paper critically analyzed about unequal power relationships between men and women, in all societies and in all phases of their life cycle, women face discrimination and violence at the hand to the state, the community and the family. The violence that they face various inform low level physical, sexual and psychological abuse of trafficking to forced prostitution, infanticide, genital mutilation and brutal murder, Bangladesh, however has a distinctive brutality against women acid violence. In most cases, other women mothers in law and sister-in-law, for example act as accomplices in such gender based violence within the family. A multi-study in rural Bangladesh reports that the most common and frequently repeated forms of violence against women in marital relationships are verbal abuse, slapping, severe beating and forced sex. Acid violence and dowry related deaths by burning or severe beatings are also on the rise in Bangladesh as indent from daily newspaper reports and studies.

172 Islam SMR; Yasmin N; Shahjahan M; Rahman M; Lahiry S. Gender based domestic violence against married women among the slum dwellers in Dhaka. *SUBJPH*. 2008; 1(2): 2-5.

The present study was done to find out the prevalence and factors affecting gender based domestic violence against married women of selected slum dwellers in Dhaka city. This cross-sectional study was conducted between August 2006 to December 2006 to determine the prevalence and risk factors for gender based domestic violence against married women (GBDVAMW), inflicted by their husband, in the slum area of Dhaka city. Bivariate correlation and chi-square tests and that were done for data analysis to determine the domains of violence that served as the dependent variable. The study results found that prevalence of GBDVAMW was to be 57.3%. Prevalence of physical violence was found to be 44.8%; sexual violence 18.2% and psychological violence 22.9%. The significant factors associated with physical and psychological violence were level of education of the partner and parents of the respondent and the literacy of the respondent herself ($p<0.05$), history of women violence in the women's family ($p<0.00$l, OR 95%CI=2.87-7.99). Factors related to sexual violence were 'dowry contact' ($p<$O.OS, OR=l .8, C11 .02-3.04) and women violence in the family of the respondent ($p<0.05$, OR=l.93; 95%CI=l.11-3.37). Study findings confirm that violence against women is a prevalent phenomenon in slum area in Dhaka city. Awareness-raising campaigns about intimate partner violence should bring this important issue to the frontline of public discussion. Such efforts can potentially help assuring that future generations would not experience partner violence to the extent that contemporary Bangladeshi women do. Women and girls must learn not to give in to violence, to stand up for them and exercise the right they have. Boys and men must be offered new role models to allow them to assume new behavior patterns based on partnership rather than power and dominance.

173 Nahar L; Khan TI; Akhter S. Dowry and its Implications in domestic violence against women: situation analysis from slum area of Dhaka City. Dhaka: BIRPERHT, 2009.

The study was conducted to review the dowry practice, to identify the factors participated domestic violence, to find out the relationship between domestic violence and dowry and to assess the impact of domestic violence on the physical and mental health of women and their coping strategies. Data were collected from 4 slums area of two Wards named Bawniabadh and Vasantak in Dhaka city. Dowry is a deep-rooted gender issue with social, economic and health consequences. Dowry is one of the responsible factors causing violence against women and put women in a helpless situation. Socio-religious practices provokes dowry that completely violate the dignity of women. Dowry is battered at more than ninety percent of the marriages in Bangladesh. Forty percent respondents complied with the 2nd demand of dowry to keep peace in the family. Some paid the dowry again to stop torture; some did it to prevent divorce. Consequence of the failure to pay is grave; the women even had to endure physical assault for not paying dowry on fourth demand. In the research Odds of being tortured in family are found to be twice in respondents who paid dowry than those didn't pay dowry. Married females who paid dowry at marriage have a higher likelihood of reporting domestic violence compared to those who did not. In addition, the relation between dowry and abuse is highly level-specific: respondents who paid large dowries report much higher levels of abuse than those who paid small dowries. The study explored the dowry practice among poor slum families, its adversities and its impact on women's physical and mental health. It is expected that the findings would help the policy makers and law enforcer to save the women from this social evil. More over the finding will help prioritizing the action to prevent violence against women.

174 Silverman JG; Decker MR; Gupta J; Kapur N; Raj A; Naved RT. Maternal experiences of intimate partner violence and child morbidity in Bangladesh. ***Arch Pediatric Adoles Med*****. 2009; 163(8) :700-705.**

The study was undertaken to examine of past year intimate partner violence (IVP) among married Bangladeshi mothers of children aged 5 years and younger and the risk of recent acute respiratory tract infection (ARI) and diarrhea among children aged 5 years and younger based on the IPV experiences of their mother in the past year. The present study used the data of Bangladesh Demographic and Health Survey (BDHS) 2004, conducted by the National Institute of population Research and Training (NIPORT) of the Ministry of Health and Family Welfare of Bangladesh from January 1 to May 31, 2004. The BDHS sample was drawn from all Bangladeshi adults who reside in private dwellings. For purposes of the present analysis, only those women currently married, with at least 1 child aged 5 years of younger and living with both their husband and their children were included (N=1592). The prevalence of past year IPV was calculated. The study revealed that more than 2 of 5 married Bangladeshi mothers (42.4%) with children aged 5 years and younger experienced IPV from their husbands in the past year. Mothers who experienced IPV were more likely to report recent ARI (adjusted odds ration, 1.37; 95% confidence internal, 1.03-1.83) and diarrhea (adjusted odds ration, 1.65; 95% confidence internal, 1.15-2.38 among their young children compared with those who did not experience IPV. The results of the study suggested that such at use threatens not only the health of women but also that of their children. Prevention of IPV preparation by men may be critical to the improvement of maternal and child-health. Low birth weight and pre-maturity may also represent mechanisms by which IPV may increase the risk of childhood illness; both factors relate to a significantly increased likelihood of child morbidity and mortality. Findings of the study calls for prevention of IPV as a priority in improving maternal and child health and the critical need to integrate rate IPV prevention and intervention efforts within the existing maternal and child health infrastructure.

2.10 COST-BENEFIT ANALYSIS-MCH & FP SERVICES (contraceptive prices, cost-effectiveness, sustainability, etc.)

175 Anonymous. Introducing pay-for-performance (P4P) approach and increase utilization of maternal, newborn and child health services in Bangladesh: workshop report. Dhaka: Population Council, 2010.

The study aim was to utilize existing projects intervention components and introduce models to provide financial incentives to the providers as pay-for-performance (P4P), and to the poor pregnant women and mothers of newborn and under-five children in form of coupons. The first and foremost task of this pilot study is to develop an implementing P4P mechanism and coupon guidelines. To develop the guidelines, workshops with both national and local level program managers and service providers were organized. The mechanism for introducing P4P initiatives into the government health system has been delineated in the guidelines. The P4P mechanism has been sketched out based on the workshop findings. P4P project will be implemented in three districts. As the study is nested within GOB-UNICEF's existing MNCH/MNH projects, three districts have been purposively selected by UNICEF for intervention. The selected districts are Jamalpur, Gaibandha and Kurigram, Nilphamari was initially selected. The key recommendations regarding the P4P mechanism are: Incentives will be provided to motivate service providers at the facility level. Program managers and MNCH service providers at District Hospital and Upazila Health Complex will be entitled to receive incentives. Incentives will be allocated to program managers, service providers and administrative and support staff. One-month or one and half months' basic salary will be rewarded as performance payment in a quarter if the facility attains first and second levels of performance target, respectively. Program managers and direct service providers will receive full incentive (one-month's basic salary per quarter) while indirect service providers and administrative and support staff will be entitled to half incentive.

176 Borghi J; Sabina N; Ronsmans C; Killewo J. Comparison of costs of home and facility-based basic obstetric care in rural Bangladesh. *J Health Popul Nutr.* 2010; 28(3): 286-293.

The aim of this study was to estimate and compare the costs of providing basic obstetric care in the home and in a low-level health facility in rural Bangladesh. The average costs were estimated by interviewing midwives and from institution records. The main determinants of cost in each setting were also assessed. The cost of basic obstetric care in the home and in a facility was very similar, although care in the home was cheaper. Deliveries in the home took more time but this was offset by the home took more time but this was offset by the capital costs associated with facility-based care. As use-rates increase, deliveries in a facility will become cheaper. Antenatal and postnatal care was much cheaper to provide in the facility than in the home. Facility-based delivery care is likely to be a cheaper and more feasible method for the care provider as demand rises. The average costs of basic obstetric care in the home and in a sub-centre were similar, although the costs of care in the home were lower (by Tk. 76). Home-based care will be cheaper. Antenatal and postnatal care was much cheaper to provide in the facility than in the home, an estimated difference of between Tk. 214 and Tk. 217 per visit. Facility-based delivery care is likely to be a cheaper and more feasible method for the care provider as demand rises. Since safe motherhood programs aim for maximum coverage of skilled attendance at delivery, facility-based care is likely to be a cheaper and more feasible method for the care provider as demand rates. In settings where rates of skilled attendance are very lo, home-based care will be cheaper. Further

research is needed to identify the optimal mix of facility- and home-based care in different settings.

177 Chankova S; Howlader SR; Hamid SA; Routh S; Sultana S; Wang H. Costing of maternal health services in Bangladesh. Maryland & Dhaka: Abt Associates Inc. & RTM International, 2010.

The purpose of this activity was to provide valuable information to the MOH&FW and its Health Economics Unit (HEU) to support the planning and budgeting for maternal health services. First, out of the 64 districts in Bangladesh, two districts were chosen for the survey; Patuakhali and Sirajgonj. It was expected that data from the two different parts of the country would provide a more representative scenario of the country. A total of 18 health care facilities were selected across the two districts, including 10 public, 4 private for-profit and 4 NGO facilities. In private for-profit and in NGO facilities, all data was collected using a provider questionnaire capturing the fees/charges for maternal health services. Improving maternal health service provision requires adequate resource allocation and strategies to address both the supply side and demand side barriers for maternal health services. Effective planning and budgeting of health services requires comprehensive information on the costs of service provision. Particularly the unit costs incurred by providers per patient visit/treatment episode. A full costing of the maternal health services, including both provider and consumer costs can help improve the design and budget allocation for safe motherhood programs, as well as any comparable national maternal health financing plan. In addition, such information can help estimate the required financial resources to achieve the targets related to MDG 5. However, in Bangladesh, there are no comprehensive data on unit costs of key maternal health services based on the results of this study, a number of policy strategies can be considered by policymakers: The first recommended policy strategy is service decentralization. The results of this study indicated that about two-thirds of ANC services that are delivered in public health facilities are delivered by secondary and tertiary healthcare facilities. The second recommended strategy is system integration, to support a service decentralization policy. The third policy strategy that needs to be considered is public-private partnership. As this study point out, about 40% of maternal patient-visits (treatment episodes) would be in private sector facilities, accounting for nearly two-thirds of the required financial resources for maternal health services consistent with MDG5,

178 Dutta A. Demographic effects in demand analysis: estimation of AIDS model from household budget data. *South Asian journal of population and health.* 2009 July; 2(2):123-130.

The study aim was to investigate the impact of demographic variables on demand behavior by applying an extended version of the most widely used Almost Ideal Demand System (AIDS) model of Deaton and Muellbauer (1978). The study is based on the full set of micro-level cross section Household Income and Expenditure Survey (HIES-2000) data of 7440 household published by BBS and as such this can be viewed as a national level study. The data were aggregated into the following 6 categories: (a) meat, (b) eggs, (c) fruits, (d) milk, (e) butter, (f) leafy vegetables. The results obtained in this study are mostly sensible. With respect to demographic effects, it found that family size and dependency ratio have a statistically significant effect on demand behavior. However, these results are interesting in that they provide additional insight into the complexity of the way in which a household's demand behavior is conditional in its demographic profile. The findings of the study can also be used in wide range of applied works

in the relevant areas. So, the study is thus likely to contribute in public policy research of Bangladesh.

179 Hatt L; Nguyen H; Sloan N; Miner S; Magvanjav O; Sharma A; Chowdhury J; Paul D. Economic evaluation of demand-side financing (DSF) program for maternal health in Bangladesh. Dhaka: MOH&FW, Health Economics Unit, 2010.

The main objective of the DSF program is to accelerate progress toward Millennium Development Goal-5 (MDG 5) to improve maternal health, by stimulating increased utilization of safe maternal health services by poor pregnant women, including antenatal care (ANC), delivery by qualified providers, emergency obstetric and postnatal care (PNC). The evaluation used multiple data collection and analytic methods to obtain a comprehensive, in-depth understanding of the effects of this program on the use of maternal health services, as well as how they are provided. Qualitative and quantitative data shed light on what has worked well, and where challenges remain, in the operations, implementation, and impact of the DSF program. This evaluation (conducted over June-December 2009) focuses on the 21 Upazilas where the program was functioning by mid -2007 and thus covers two years of experience with the DSF program. The study found that the evaluation compares DSF program intervention upazilas to matched control upazilas, in order to evaluate demand-side and supply-side impacts of the program, and also conducts a focused assessment of program operations in DSF upazilas. This evaluation is that the DSF program has had an unprecedented positive effect on the utilization of maternal health services in the short time since its initiation. The rate of deliveries attended by qualified providers is now more than twice as high in DSF program upazilas (64%) compared to control upazilas (27%). The rate of institutional deliveries is now twice as high in DSF program upazilas (38%) compared to control upazilas (19%). There is no statistically significant difference in the rate of C-sections between DSF areas (10%) and control areas (9%). Women in DSF program upazilas are significantly more likely to have at least 3 ANC visits (55%) than women in control upazilas (34%). The report provides a range of recommendations; given how rapidly and extensively the provision of safe motherhood services improved in this pilot, and given the average voucher program cost of $41 per voucher. Continued investment in EOC upgrades is recommended. Greater efforts should be made to encourage facilities to use the seed fund for quality improvements. While there is good overall awareness of the DSF program, information and behavior change communication campaigns should be launched to improve understanding of specific DSF benefits, as well as broader safe motherhood messages.

180 Luoma M; Jobayda F; Chowdhury JH; Wang H. Incentives to improve retention and performance of public sector doctor and nurses in Bangladesh. Montgomery & Dhaka: Abt Associate Inc. & RTM International, 2010.

The study was commissioned to design an incentives system and other interventions to improve rural and to support good performance and quality of care. The incentive system design was based on, i) a review of relevant international and regional taker ii) Key informant interviews with policy makers iii) with Upazila Health and Family Planning Officer (UHFPO), and iv) focus group discussions (FGDs) and in-depth discussion with doctors and nurses. During the discussions the facilitator asked questions about working conditions, living conditions, performance support factors, overall job satisfaction and intentions to transfer from the current posting. The study findings showed that discussions with nurses include lack of basic utilities and functional equipment in remote areas, lack of career advancement opportunities in rural and remote areas, substandard accommodation, poor quality schools in remote and rural areas and lack

of physical security in remote areas. The discussions with doctors were similar to those nurses with an additional point; doctors in rural areas are unable to augment their incomes through private practices as can doctor in urban areas. The doctors who are posted in urban areas were generally satisfied, rural doctors and nurses had mixed levels of satisfaction, and these in remote areas were quite dissatisfied with their employment situation. During informant interviews with policy makers study got learn that although the GOB policy states that all postings, including those in rural a remote areas, are to be for there years only. This policy is almost followed: Providers are sent to remote areas and special years, UHFPOs in general felt that there were not enough posts at their facilities, given patient load. The study recommended the following measures should be taken for future development; i) to be taken performance planning, monitoring and evaluation system; ii) to be ensured training in supportive supervision; iii) to be fixed and mandatory posting of two yrs, post graduation; iv) to be given promotion after mandatory posting; v) to be developed working and living physical condition improvements; and vi) to be given carrier an incentives and living with financial incentives.

181 Rahman M; Rob U; Kibria T. Implementation of maternal health financial scheme in rural Bangladesh. Dhaka: Population council, 2009.

The project objectives were : i) developing a system to distribute vouchers to poor rural pregnant women for maternal health care services; ii) identifying private and NGO facilities that can provide quality maternal health care services to poor pregnant women; (iii) increasing the capacity of service providers in offering antenatal care (ANC), delivery and post-natal care (PNC) services; and (iv) improving the level of utilization of antenatal care, delivery and postnatal care services from trained service providers by poor, rural, pregnant women. The study used a pre and post test design to examine the effectiveness of the interventions in two unions of Habiganj district. A voucher management agency (VMA) was created, in which RTM international was responsible for managing the financial expansible for managing the financial aspects and population council for managing the technical aspects. The 21-day hands-on-training session for the FWVs to perform normal delivers at HFWCs was found appropriate. Findings from the end line survey revealed that knowledge on maternal health care issues including life threatening complications, sources of treatment for complications, place of safe delivery, intake of vitamin A capsule and duration of exclusive breast feeding, had increased significantly compared to the baseline. In-depth interviews revealed that women did not experience any problems in obtaining the voucher book from the field workers overall they expressed positive perceptions. Formation of coordination committees at district and upazila level is essential to identify eligible health facilities and to establish reimbursement mechanism for the vouchers. The process of identifying poor pregnant women and distribution of the vouchers needs to begin early in pregnancy to ensure that the women can benefit from the full range of services covered.

182 Rob U; Rahman M; Bellows B. Using vouchers to increase access to maternal healthcare in Bangladesh. *International Quarterly of Community Health Education*. 2010; 30(4): 293-309.

The overall objective of this operations research project was to test the feasibility and effectiveness of introducing financial support (voucher scheme) for poor rural women to improve utilization of antenatal care (ANC), delivery and postnatal check-up (PNC) from trained service providers. A pretest-posttest design was utilized. A total of 436 women were interviewed before and 414 after the intervention to evaluate the impact of interventions. In-depth interviews were conducted with users and non-users of vouchers. Findings showed that institutional deliveries

have increased from 2% to 18%. Utilization of ANC from trained providers has increased from 42% to 89%. Similarly, utilization of PNC from trained providers has increased from 10% to 60%. The proportion of women who did not access any antenatal care services decreased from 21% to 11% and the proportion of women who received this service from a trained service provider increased from about 50% to 100%. Similarly, the proportions of women attending for first, second, and third antenatal visits increased over time .A Significant number of women received physical and medical examination facilities during antenatal care visits. Increasing the proportion of deliveries assisted by trained providers is essential to achieve the MDG of reducing the maternal mortality ration. At baseline, training providers attended only 6% of births, whereas at end-line this proportion increased to 22%. The proportion of women who received postnatal care increased significantly to 60% at the end-line; moreover, at the baseline, only one-fourth of women accessing postnatal care received it from trained providers, which increased to 100% at end-line. Although the proportion of women using antenatal care, postnatal care, institutional deliveries, and deliveries assisted by trained providers increased significantly, it is important to note that these proportions remained relatively low after the intervention. The majority of women received vouchers during the later stages of their pregnancy (85% received them during the third trimester), which was due to the short duration of the intervention period and so had less opportunity to avail ANC services. The voucher pilot program appeared to increase utilization of ANC, delivery, and PMC among poor women in project areas.

183 Sarowar MG; Medin E; Gazi R; Koehlmoos P; Rehnberg C; Saifi R; Bhuiya A; Khan J. Calculation of cost of pregnancy and puerperium-related care: experience from a hospital in a low-income country. *J Health Popul Nutr.* 2010 Jun; 28 (3): 264-272.

The aim of the study was to calculate the hospital care cost of disease specific cases especially pregnancy and puerperium related cases and to identity the practical challenges of conducting costing studies in the hospital setting in Bangladesh. A combination of micro costing and step down cost allocation was used for colleting information on the cost items and ultimately, for calculating the unit cost for each diagnostic case. Data were collected from the hospital records of 162 patients having different clinical diagnoses. In Bangladesh a large scale study on calculation of hospital cost was carried out by the HEU (MOHFW) and Mymensing Medical College Hospital (MMCH) for the 1994-1995 financial years. The results of the study indicated that estimation of costs in a similar setting in Bangladesh is possible such information would be helpful for policy makers in planning a reimbursement system for the public hospitals. By comparing the costs of maternal care in other sectors e.g. private for profit and non-profit, the policy makers can find information on effective resource allocation regarding maternal care services. The study calculated the mean cost for two different admitted groups of subjects relating to pregnancy and puerperium. Complication of disease and the duration of stay were the two major reason of the total costs; as an example, a non- complicated medically managed patient costs US$53 where are the complicated patient costs US$114. Despite some constraints, the findings of the study indicated that it is feasible to carry out a large scale study to further explore the costs of different hospital care services.

184 Talukder MN; Rob U; Rahman L; Hena IA; Akter F; Rahman MA; Julkamayeen M; Akteruzzaman M; Rana MS; Ali R. Facility assessment report: introducing pay-for-performance (P4P) approach to increase utilization of maternal, newborn and child health services in Bangladesh. Dhaka: Population Council & UNICEF, Bangladesh, 2010.

The main objective of the assessment was to know the present condition of the facility infrastructure, human resources, equipment, logistics and medicines and also to identify and gaps of the facility in providing quality service so that initiatives can be made to improve quality. The facility survey was designed to assist program managers to plan improve of health service delivery system by assessing health facilities whether they meet the standard to provide MNCH services. Data were collected through key informant interview observation. Interviews were conducted with Civil Surgeon, Deputy Director (FP), Consultants in Gyne/Obs, Pediatrics and Anesthesiology, Upazila Health and Family Planning Officer, Upazila Family Planning Officer, RMO, doctors, nurses and staffs. Human resources data were also collected. Information collected on physical infrastructure was analyzed in terms of building, utility, prevention, communication and transportation. It was found that there was no facility without any female beds. Among all 16 facilities, Bhurungamari Upazila Health Complex (UHC), Kurigram did not have a functioning labor room. Shaghata Upazila Health Complex, Gaibandha did not have any labor beds. There were neonatal beds at all District Hospitals while out of 12 UHC reported having no neonatal beds. All district hospitals had generators. However, the generators in Gaibandha and Thakurgaon district hospitals were not functioning. Majority of the UHC had the generator, which was, however, not in a working. All district hospitals practiced infection prevention through autoclave-sterilization of instruments and provision of separate waste bins for liquids, solid and sharp. None of the UHC in Gaibandha practiced infection prevention through autoclave-sterilization of instruments. Analysis of information on the availability of doctors at the facilities indicates the Jamalpur was in the best condition in terms of headcounts of doctors, while Gaibandha was in the worst condition. Facilities in Gaibandha were in the best condition in terms of availability of nurses followed by facilities in Jamalpur. Among four UHCs, Islampur UHC of Jamalpur had all required specialist doctors. All facilities reported availability of most of the essential medicines for mother and child, Kurigram district hospital was found in the best condition regarding the availability of essential medicines for mother and child, followed by Jamalpur district hospital. It has emerged from this assessment report that no facility is in a perfect condition to provide quality EmOC services as all the facilities are burdened with problems related to human resources, physical infrastructure, equipment, logistics and supplies, and medicines. Before initiating the performance-based incentives, the lacking in physical and human assets identified through the rapid facility assessment and facility accreditation must be addressed. Subsequently, the DGHS will be requested to solve the human resource problem. For logistics and equipments, UNICEF will be initiated to take initiatives. Population council will be responsible for ensuring the regular supply of medicines and consumables.

2.11 NUTRITION

185 Abdullah K; Malek MA; Faruque ASG; Salam MA; Ahmed T. Health and nutritional status of children of adolescent mothers: experience from a diarrheal disease hospital in Bangladesh. *Acta Paediatrica*. 2007; 96: 396-400.

The aim of the study was to assess clinical and nutritional features and socioeconomic characteristics of the first birth order children (1-48 months) of adolescent mother. Five hundred and thirty-nine adolescent mothers (aged ≤ 19 years) and their children attending (as a patient) the Dhaka hospital of ICDDR, B (2000-2005) constituted the study population. A group of 540 comparatively older mother aged 25-29 years (when attending hospital) and their children served as the comparison group. The study found as results that malnutrition indicated by under weight [OR 2.3, 95% Cl 1.7-3.1, p<0.001], stunting [OR 2.1, 95% Cl 1.5-2.8, p<0.001], wasting [OR 1.8, 98% Cl 1.3-2.7, p=0.001], infancy (<12 mother old) [OR 2.8, 95% Cl 2.1-3.9, p<0.001] duration of hospitalization (≥ 484)[Or 1.6, 95% Cl 1.2-2.2, p=0.001], DPT immunization [OR 1.8, 95% Cl 1.3-2.5, p=0.001] and maternal illiteracy (no formal schooling) [OR 1.5, 95% cl 1.1-2.0, p=0.007] were significantly associated with children of adolescent mothers, after adjusting for co-variate in the logistic regression analysis similar results were also observed when different indices of malnutrition were added separately to the different models. Underweight, stunting, severe underweight, lack of vitamin A supplementation, longer duration of hospitalization, more illiterate mothers, less monthly family income and less chance to use sanitary toilet at home were the variables significantly associated with children of mothers aged 20-24 years compared to children of mothers aged 25-29 years. Therefore the study findings indicated the need to support adolescent mothers and their children through special interventions for addressing their preventive and curative health needs, including improvement of their nutritional status and timely immunization.

186 Aboud FE; Shafique S; Akhter S. A Responsive feeding intervention increases children's self feeding and maternal responsiveness but not weight gain. *The Journal of Nutrition.* 2009; 139:1-6.

This study perused this inquiry by evaluating an intervention implemented in a food insecure region of Bangladesh to increase self-feeding and maternal responsiveness. Using a cluster randomized field trial, the study evaluated a session educational program that emphasized the practice of child self feeding and maternal responsiveness. A total of 108 mothers and their 8 to 20 old children in 19 clusters were randomly assigned to the intervention groups and 95 in 18 clusters were assigned to the information control group. The study took place between April and December 2007 and was registered with International Standard Randomized Controlled Trial (ISRCT) number 150000469. The study results showed that ninety-five control mothers and 108 intervention mothers were recruited, approximately 5% of the sample was lost to follow up, 7% of control mothers and 2% of intervention mothers, Observations of intervention session during wk 3 and irregular visit by the organization supervisors confirmed high fidelity (>95%) to the responsive feeding manual A(supplemental material) on 10 critical elements such as demonstration, practices, coaching feeding position, and mothers participation in discussion. Attendance was likewise high (>90%) for all except 2 who never attended. The sample was representative of Bangladesh in that 33.7% of control children and 39.8% of intervention children were >2 SD below the median of the WHO child grow standards. Self feeding and fewer refusals would lead to more mouthfuls in the intervention group. However the number of mouthfuls eaten

by children did not differ. Fortunately there was no decrement despite mother's expectation that children who fed themselves would eat less. In fact, there was strong positive co-relation between number of mouthfuls and proportion self fed (r=+0.37, adjusting for Childs age; p<0.0001) and a corresponding inverse correlation with mother feeding. In the intervention area, dietary diversity was low, with only 28.4% eating ≥4 of 7 critical feed types the previous day. This is regarded as a feed-insecure region of the country because of its low daily ways and seasonal shortage of feeds. The low diversity and few mouthfuls indicate insufficient equality and quantity of intake. The results point to the importance of household rescores (eg. Education assists feed security) to improve the child's dietary diversity, which must accompany self-feeding. The responsive feeding intervention tested here provided significant improvement in children's self feeding and mother's verbal responsiveness. Behavior changes and message recall in dictate that the implemented behavior change strategy may be a useful addiction to existing education programs for malnourished children. However, in feed insecure areas, food supplementation may be necessary to translate these behavior changes into weight gain.

187 Akhter S; Rezawana S; Khatun F; Sultana S; Hossain AMMM. Comparison of nutritional status among 2-5 years children between an urban and a rural area of Bangladesh. *Bangladesh Journal of Nutrition.* 2007-2008 Dec; 20-21: 63-70.

It was a cross sectional and comparative study to observe the nutritional status of children of age range from 2 to 5 years in an urban and a rural area of Bangladesh. The study was conducted on 400 children dividing 200 in rural area and 200 in urban area. The study also conducted to identify the clinical status in relation to anemia, vitamin A deficiency (Night blindness, Bitotspot), vitamin B deficiency (Celosias, Glossitis, Angular Stomatitis), scabies, dental caries, otitis media, upper respiratory tract infection (URTI), Urinary Tract Infection (UTI) and Enlargement of thyroid gland. Special attention was given to observe the anthropometric measurements. Nutritional status of children was assessed by using Z score, mid arm circumference and skin fold thickness. To assess the growth performance, we used three indicators weight for age Z score (WAZ), height for age Z score (HAZ) and weight for height Z score (WHZ) and compared them between urban and rural area. The other objectives were to assess the bio chemical parameters of children in terms of hemoglobin level in blood, parasitological presence of Ascaris Lumbricoides (AL), Ancylostoma Duodenal (AD) and Treacheries Trichura (TT) in stool. According to skin fold thickness, the mean biceps of urban children were different than that of rural children, with established significant test. The triceps (Urban 7.76±2.29 rural 8.50±5.80) and sub scapula (Urban 7.00±2.89, Rural 6.57±3.66) measurements of children in urban and rural areas were not significantly different. Again 92.5% children were found normal and 7.5% were moderately under nutrition in respect of MAC measurements. Dental caries, vitamin deficiency and otitis media were seen among a large number of children in urban and rural areas. The results of the study revealed that in urban area 49.0% and in rural area 49.5% children were anemic (Hb level ≤ 11 gm/dl). The AL, TT and AD presence in stool of children were not significantly different between urban and rural areas. Therefore the study indicated that the nutritional intervention program can be implemented in all vulnerable groups, including children. Initiatives for increasing food and nutrient intake in all sectors of children of rural and urban areas have to be taken for eradication of malnutrition in Bangladesh.

188 Akter S; Rahman MM. Duration of breastfeeding and its correlates in Bangladesh. *J Health Popul Nutr*. 2010 Dec; 28(6): 595-601.

The aim of this study was to examine the duration of breastfeeding and also to explore the socio-demographic determinants of the duration of breastfeeding in Bangladesh. Data for the study were

drawn from the Bangladesh Demographic and Health Survey 2004. In total, 5,364 mothers were included in the study. Information was collected on education, age, and reproductive behavior, availability of family planning supplies, breastfeeding, child health, and maternal status. A sample of 10,500 households was selected from which 11, 444 women were interviewed. The life table and Cox's proportional hazards model were employed for the analysis of breastfeeding–related data, which showed that the average duration of breastfeeding was 31.9 months. Cox regression analysis revealed that the duration of breastfeeding was positively associated with maternal age, contraceptive-use, work status, and religion and was negatively associated with age at marriage, parity, delivery status, region, and maternal education. Younger mothers, having higher education, higher maternal parity, caesarean-section birth, being a Muslim, and mothers who have not used any contraceptive were associated with lower duration of breastfeeding. The findings suggest that health institutions can play a significant role in promoting breastfeeding in Bangladesh. Educational campaigns that stress the benefits of lactation are important strategies for encouraging mothers to breastfeed longer.

189 Alam DS; Van Raaij JMA; Hautvast JGAJ; Yunus M; Wahed MA; Fuchs GJ. Effect of dietary fat supplementation during late pregnancy and first six months of lactation on maternal and infant vitamin A status in rural Bangladesh. *J Health Popul Nutr.* 2010 Aug; 28(4): 333-342.

The aim of the study was to examine the effect of supplementing women with fat from mid-/late pregnancy until six months postpartum on their vitamin A status and that of their infants. Women recruited at 5-7 months of gestation were supplemented daily with 20 mL of soybean-oil (n=248) until six months postpartum or received no supplement (n=251). Dietary fat intake was assessed by 24-hour dietary recall at enrollment and at 1, 3 and 6 months postpartum. Concentrations of maternal plasma retinol, β-carotene, and lute in were measured at enrollment and at 1, 3 and 6 months postpartum, and those of Infants at six months postpartum. Concentration of breast-milk retinol was measured at 1, 3 and 6 months postpartum. The change in concentration of plasma retinol at three months postpartum compared to pregnancy was significantly higher in the supplemented compared to the control women (+0.04 vs. -0.07 µmol/L respectively; p<O.OS). Concentrations of plasma β-carotene and lute in declined in both the groups during the postpartum period but the decline was significantly less in the supplemented than in the control women at one month (β-carotene -0.07 v-0.13 µmol/L, p<0.05); lateen -0.26 vs. -0.49 µmol/L, p<O.OS) and three months (-0.04 vs. -0.08 jimol/L, p<zO.05); lute in -0.31 vs. -0.47 µmo1/L, p<0.05). Concentration of breast milk retinol was also significantly greater in the supplemented group at three months postpartum than in the controls (0.68±0.35 vs. 0.55±0.34 µmol/L respectively, p<0.03). Concentrations of infants' plasma retinol, β-carotene, and lute in, measured at six months of age, did not differ between the groups. Fat supplementation during pregnancy and lactation in women with a very low Intake of dietary fat has beneficial effects on maternal postpartum vitamin A status.

190 Alam N; Roy SK; Ahmed T; Ahmed AMS. Nutritional status, dietary intake and relevant knowledge of adolescent girls in rural Bangladesh. *J Health Popul Nutr.* 2010 Feb; 28 (1): 86-94.

The objectives of the study were to provide them with such information that would assist in planning for remedial actions to address health and nutrition needs of adolescent girls in Bangladesh. It used the data from the Baseline Survey 2004 of the National Nutrition Program. A stratified two-stage random cluster-sampling was used for selecting 4,993 unmarried adolescent

girls aged 13-18 years in 708 rural clusters. Female interviewers visited girls at home to record their education, occupation, dietary knowledge, seven-day food-frequency, intake of iron and folic acid, morbidity weight, and height. They inquired mothers about age of their daughters and possessions of durable assets to divide households into asset quintiles. Results revealed that 26% of the girls were thin with body mass index (BMI) for-age<15^{th} percentile), 0.3% obese (BMI-for-age>95^{th} percentile), and 32% stunted (height-for-age ≤2SD). Risks of being thin and stunted were higher if girls had general morbidity in the last fortnight and foul-smelling vaginal discharge than their peers. Consumptions of non-staple good-quality food items in the last week were less frequent and correlated well positively with the house hold asset quintile. Girls of the highest asset quintile ate fish/meat 2.1 (55%) days more and egg/milk two (91%) days more than the girls in the lowest asset quintile. The overall dietary knowledge was low. More than half could not name the main food sources of energy and protein, and 36% were not aware of the importance of taking extra nutrients during adolescence for growth spurt. The use of iron supplement was 21% in nutrition-intervention areas compared to 8% in non-intervention areas. Factors assonated with the increased use of iron supplements were related to awareness of the girls about extra nutrients and their access to mass media and education. Community-based adolescent-friendly health and nutrition education and services and economic development may improve the overall health and nutritional knowledge and status of adolescents.

191 Arifeen SE; Baqui AH; Victora CG; Black RE; Bryce J; Hoque DME; Chowdhury EK; Begum N; Akter T; Siddik A. Sex and socioeconomic differentials in child health in rural Bangladesh; findings from a baseline survey for evaluating integrated management of childhood illness. *J Health Popul Nutr.* 2008 Mar; 26(1): 22-35.

The study aim was to examine rates and differentials by sex and socioeconomic status for three aspects of child health in rural Bangladesh: morbidity and hospitalizations, including severity of illness; care-seeking for child illness; and home-care for illness. The survey was carried out among a population of about 380,000 in Matlab Upazila (sub-district). Generic MCE Household Survey tools were adapted, translated, and pre-tested. Trained interviewers conducted the survey in the study areas. In total, 2,289 under-five children were included in the survey. Results showed a very high prevalence of illness among Bangladeshi children, with over two-thirds reported to have had at least one illness during the two weeks preceding the survey. Most of the sick children in this population had multiple symptoms, suggesting that the use of the IMCI clinical guidelines will lead to improved quality of care. Contrary to expectations, there were no significant differences in the prevalence of illness either by sex or by socioeconomic status. About one-third of the children with a reported illness did not receive any care outside the home. Of those for who outside care was sought, 42% were taken to a village doctor. Only 8% were taken to an appropriate provider, i.e. a health facility, a hospital, a doctor, a paramedic, or a community-based health worker. Poorer children than less-poor children were less likely to be taken to an appropriate healthcare provider. The findings also indicated that children with severe illness in the least poor households were three times more likely to seek care from a trained provider than children in the poorest households. Any evidence of gender inequities in child healthcare, either in terms of prevalence of illness or care-seeking patterns was not found. Care-seeking patterns were associated with the perceived severity of illness, the presence of danger signs, and the duration and number of symptoms. The results highlight the challenges that will need to be addressed as IMCI is implemented in health facilities and extended to address key family and community practices including extend low rates of use of the formal health sector for the management of sick children. Child health planners and researchers must find ways to address the apparent population preference for untrained and traditional providers which is determined various factors, including

the actual and perceived quality of care, and the differentials in care-seeking practices that discriminate against the poorest households.

192 Arsenault JE; Yakes EA; Hossain MB; Islam MM; Ahmed T; Hotz C; Lewis B; Rahman AS; Jamil KM; Brown KH. The Current high prevalence of dietary zinc inadequacy among children and women in rural Bangladesh could be substantially ameliorated by Zinc bio-fortification of rice. *The Journal of Nutrition*. 2010 Jun; doi: 10.3945/jn.110.123095 (1683-1690).

The primary objectives were to quantify rice and zinc intakes of young children and women and to simulate the potential impact of zinc bio-fortified rice of zinc intake adequacy. In addition, the authors assessed the anthropometric status and serum zinc concentrations of the children to further appraise their risk of zinc deficiency. The study measured dietary intake in a representative sample of 480 children (age's 24-48 mo) and their female caregivers residing in 2 rural districts of northern Bangladesh. Dietary intakes were estimated by 12-h weighted records and 12 h recall in Holmes on 2 non-secured days. Serum zinc concentrations were determined in a sub sample of children. The median (25^{th}, 75^{th} percentile) rice intakes of children and female caregivers were 134 (99,172) and 420 (365, 476) g raw weight/d respectively. The findings also revealed that the median zinc intakes were 2.5 (2.1, 2.9) and 5.4 (4.8, 6.1) mg/d in children and women, respectively. Twenty four parent of children had low serum zinc concentrations (<9.9 μmol/l) after adjusting for elevated acute phase proteins. Rice was the main source of zinc intake, providing 49 and 69% of dietary zinc to children and women respectively. The prevalence of inadequate zinc intake was high in both the children (22%) and women (73-100%). Simulated increases in rice zinc content to levels currently achievable through selective breeding decreased the estimated prevalence of inadequacy to 9% in children and 20-85% in women, depending on the assumptions used to estimate absorption. Rural Bangladeshi children and women have in adequate intakes of zinc. Zinc bio-fortification of rice has the potential to market improve the zinc adequacy of their diets. After analyzing the results, the study suggested future studies should be taken to examine children's zinc absorption from zinc bio-fortified rice and the effects of consuming zinc bio-fortified rice on indicators of zinc status.

193 Azam AZMM; Khurshed M; Bhuiyan MAH; Mahbub M. Effectiveness of non-formal nutrition education by anthropometric and biochemical parameters among children of selected mother. *SUBJPH*. 2009-2010; 2(2)-3(1):2-6.

The study was taken to estimate the effectiveness of non formal nutrition education by anthropometric and biochemical parameters among children of selected mothers. In order to determine about the superstitions beliefs and some customs of mothers the study took mothers of 114 hospitalized under 5 malnourished children were taken for study purpose and equally divided as case and control. The nutritional status of the children was assessed both anthropometrically and bio-chemically. The nutrition education was given to the mothers of case group with seven inter related tropics. After six months, nutritional status of their children was assessed and biochemical tests were done as a part o follow-up evaluation. Results of weight for age, weight for height and height for age of case groups having $\pm$ these 2SD after six months showed 19.35% (p=0.008), 78% (p=0.000), and 58.33% effectiveness of nutrition education respectively but results of control group having anemia also showed 23% effectiveness (p=0.000), but these of control group shows 6.6% effectiveness only. All of these findings clearly showed the effectiveness of nutrition education which lead to improvement of nutritional status of under 5 children.

194 Azam AZMM; Khurshid AAM; Hossain MA; Khan S; Hossain AMMM; Bhuiyan MAH. Effects of nutrition education on nutritional knowledge of the respondent mothers and STP of their hospitalized children. *The ORION Medical Journal*. 2009 Jan; 32(1): 616-618.

The study was carried out to assess the effects of nutrition education on nutritional knowledge of the respondent mothers and STP of their hospitalized children. Mothers of 114 hospitalized under 5 malnourished children were taken for study purpose that was equally divided as case and control. Baseline knowledge of the mothers was tested by a standard questionnaire. After giving nutrition education, their knowledge was tested immediately and again after six months. About common foods, 37.5% of case group responded correctly initially but after six months it was 73%, where as 32% of control group initially responded correctly and after six months it was 36%. When considering knowledge of balanced diet, 44% of case group responded correctly and after six months it is increased to 71%, whereas in control group initially it was 52% and after six months it became 54%. Regarding false belief and food misconception, correct answers were given initially by 49% of case group and it went up to 66% after six months. But in the control group the corresponding rise was only 4%. Regarding cooking practices and wastage of food, initially 55% of the case group had answered correctly and after six months it rose to 78%. But 55% of the control group initially responded correctly and after six months it was 59%. Regarding knowledge about iodized salt, 25% of the case group responded correctly initially and after six months it was 46%, whereas in control group it was initially 28% which increased to 32% after six months. Regarding knowledge about iodized salt, 25% of the case group responded correctly initially and after six months it was 46%, where as in control group it was initially 28% which increased to 32% after six months. Regarding deficiency diseases and their preventions, initially 49% of the case group responded correctly and after six months it rose to 88%, where as the result of control group initially was about 48% and after six months it was 51%. All of these findings indicated the impact of nutrition education which lead to improvements of knowledge among mothers of hospitalized under 5 children.

195 Baker HH; Hamadani JD; Huda SN; Grantham-McGregor SM. Undernourished children have different temperaments than better-nourished children in rural Bangladesh. *The Journal of Nutrition.* 2009; 139:1765-1771.

The objective of the study was to determine whether undernourished children aged 6-24 mo had different temperament traits than better nourished children. Two hundred and twelve undernourished children (weight for age<-2 Z-scores) attending community nutrition centers in 20 villages in rural Bangladesh and 108 better-nourished children (weight-for-age≥ -2 Z-scores) matched for age, sex, and village participated in the study. Temperament was assessed through an interviewer-administered maternal questionnaire consisting of 7 subscales: manageability, activity, emotionality, sociability, attention, suitability, and fear. After adjusting for significant covariates, the undernourished children were less sociable [regression coefficient (B) = -0.96; 95% CI=-0.04, -1.88] less attentive (B= -0.94; 95% CI= -0.19,-1.69), more fearful (B=1.43; 95% CI= 2.44, 0.42), and had comprehensive differences in temperament traits, which may increase their risk of developing behavioral and mental health problems in later childhood. In conclusion, the study found comprehensive differences in maternal reports of temperament associated with early childhood malnutrition in Bangladeshi rural children. These differences may lead to future behavior mental health problems.

196 Bari FS; Huq AKO; Hossain MA; Azad TMA; Bhuyan MAH; Khaleque SG. Evaluation of nutrition education program among selected participants of BAN-HRDB. *Bangladesh Journal of Nutrition.* 2007-2008 Dec; 20-21: 51-56.

The study was a descriptive cross sectional study which carried out to consider both the secondary and primary data. It was a purposive evaluation conducted amongst the selected population of BAN-HRDB program beneficiaries of selected areas of Bangladesh. The study population includes participants from various professions like Block Supervisors, Teachers, Imams, NGO workers, Ansar/VDP members, UP members and Housewives who participated in the Nutrition Education Program (NEP) by Bangladesh Applied Nutrition and Human Resource Development Board (BAN-HRDB) with the idea that they would eventually disseminate knowledge to the grass root level population and motivate them for better nutritional status. A total of 2000 participants were taken for evaluating their performance in both pre and post-test conducted by BAN-HRDB. The study results showed that a marked difference was observed among participants after the NEP. The mean score of nutritional knowledge before the NEP among the participants was 51.62%, which increased to 84.45% after the NEP that seems highly significant at 0.005% level. Professional variations were also observed on the score. Block Supervisors and teachers secured better nutritional score than the other professionals. The mean score among the Block Supervisors was 53.59% before the NEP, which increased to 86.97% after the NEP. The results of the study revealed that training on nutrition are very encouraging and useful for improvement of nutritional knowledge. The improvement was found to be statistically significant ($P<0.005$). Based on this improvement of knowledge, inference can be drawn that nutrition education and training is a useful intervention in improving in nutritional knowledge among the participants. The results of this, study therefore, emphasize the need for non-formal nutrition education to address the nutritional prevailing amongst them. It also justifies the need for retraining to make the nutritional knowledge more perfect and lasting.

197 Bhandari N; Kabir AKMI; Salam MA. Mainstreaming nutrition into maternal and child health programs: scaling up of exclusive breastfeeding. *Maternal and Child Nutrition.* 2008; 4: 5-23.

This review article was intended to examine the program efforts to scale up exclusive breastfeeding in different countries and draws lesson for successful scale-up. The review article was conducted a systematic literature search with no time limits defined and used data from published literature, program reports and monographs describing effectiveness or cluster randomized trials or implementation programs. It also reviewed reference lists of identified articles and hand searched reviews, bibliographical of books, and abstracts and proceedings of national and international conferences or meetings. The key processes required for exclusive breastfeeding scale-up are: (1) an evidence-based policy and science-driven technical guidelines; and (2) an implementation strategy and plan for achieving high exclusive breastfeeding rates in all strata of society, on a sustainable basis. Factors related to success include political will, strong advocacy, enabling policies, well-defined short- and long-term program strategy, sustained financial support, clear definition of roles of multiple stakeholders and emphasis on delivery at the community level. Effective use of antenatal, birth and post-natal contacts at homes and through community mobilization efforts is emphasized. Formative research to ensure appropriate intervention design and delivery is critical particularly in areas with high HIV prevalence. A key factor relevant to sustainability is to plan on a long-term basis, a period of 10-20 years rather than 5-10 years from outset. Experience with other child health programs has shown that performance in immunization and oral dehydration therapy use rates plateau over time in many countries. Strong communication strategy and support, quality trainers and training contributed significantly

to program success. Monitoring and evaluation with feedback systems that allow for periodic program corrections and continued innovation are central to very high coverage. Legal framework must make it possible for mothers to exclusively breastfeed for at least 4 months. Sustained program efforts are critical to achieve high coverage and this requires strong national- and state-level leadership. The challenge now is to build on these experiences when planning national programs.

198 Bhuyan MAH; Islam K; Ali MY; Khurshid AAM; Rana MM; Khan S. Child caring and complementary feeding practices among selected households in Dhaka city. *The ORION Medical Journal.* 2010 Jan; 33(1): 718-721.

The study was initiated to carry out among the 183 mother-infant pairs of the upper, middle and lower socio-economic households (SEH) in Dhaka city and the two stage purposive random sampling methods were applied. The study was conducted in following areas of Dhaka city which were selected purposively as per study objectives and the study places depending upon communication, availability of the samples in Gulshan, Banani, Dhanmondi, Mohamadpur, Maghbazar, Tejgaon, Malibagh, Baridhara, Mirpur and Ramna. From the background information, it was found that upper SEH (72.13% Graduate) and middle SEH (52.46% Graduate) were better educated compared to that of lower one (26.23% illiterate). Majority of upper and middle SEH mothers worked in the Govt. And NGO services, while 17% of lower SEH mothers were shopkeeper. In the lower SEH, elder persons and siblings took care of the infant; in middle SEH other family members and siblings took care of the infant; maid servants took care of the infant in upper SEH. There was a significant difference observed in total monthly income and expenditure on foods and non-food items. From the food behavior related information, it was seen that colostrums was given to their babies in upper, middle and lower SEH which were 75.11%, 85.25% and 47.54% respectively. Lower SEH preferred to give honey and sugary water. In upper SEH breast feeding initiated within 1 hour, but in middle and lower SEH it was given within 12 hours. The upper SEH mothers gave fruit juices (47.54%) as first complementary foods, on contrast to the middle and lower SEH mothers who gave mainly Khichuri with vegetables and rice/cereal based products respectively. In the lower SEH mother's breast feeding continued longer times more than middle and upper SEH. Majorities of the upper SEH preferred egg, soup or fruit/fruit juices mainly, while the middle SHE preferred meat, egg, Khichuri, fruit purees and lower SEH choose mainly the rice-potato, dal or vegetables. The anthropometric information showed that nutritional statuses of the upper SEH infants were better than other two groups.

199 Black MM; Baqui AH; Zaman K; McNary SW; Le K; Arifeen SE; Hamadani JD; Parveen M; Yunus M; Black RE. Depressive symptoms among rural Bangladeshi mothers: implications for infant development. *Journal of Child Psychology and Psychiatry*. 2007; 48(8): 764-772.

The study was undertaken to examine how maternal depressive symptoms are related to infant development among low-income infants in rural Bangladesh and to examine how the relationship is affected by maternal perceptions of infant irritability and observations of care giving practices. The study methodology was developed for measuring with among 221 infants at 6 and 12 months with the Bayley Scales II. Mothers reported on their depressive symptoms and on perceptions of their infant's temperament and a home visit were made to complete the HOME Inventory. The results showed that half (52%) the mothers reported depressive symptoms. In bi-variate analyses, maternal depressive symptoms were related to low scores on the Bayley Scales. Infants whose

mothers reported depressive symptoms and perceived their infants to be irritable acquired fewer cognitive, motor, and orientation/ engagement skills between 6-12 months than infants whose mothers reported neither or only one condition. The relationship linking maternal depressive symptoms and perceived infant irritability with infant cognitive skills was partially mediated by parental responsiveness and opportunities for play in the home. The intergenerational risks of maternal depressive symptoms in infant development extend to rural Bangladesh and are accentuated when mothers perceive their infants as irritable. Mothers who report depressive symptoms and infant irritability may lack the capacity to provide responsive, developmentally-oriented care giving environment So, interventions are needed to enhance maternal sensitivity and care-giving through low-cost techniques, such as infant massage, which can help mothers recognize and respond to their infant's signals of pleasure and discomfort.

200 Das SK; Hossain MZ; Nesa MK. Level and trends in child malnutrition in Bangladesh. *Asia-Pacific Population Journal*. 2009; 24 (2): 51-78.

The study was undertaken to determine the level and trends in malnutrition for Bangladeshi children under-five years of age in terms of stunting, wasting and underweight. The study utilized the nationwide data of Bangladesh Demographic and Health Survey (BDHS) 2004 to assess children's nutritional status. All the children under five years of age were both weighted and measured by a scale and measuring board with different methods according to the Child age. A total of 6528 children under five years of age were eligible to be weighed and measured. The study findings revealed that the situation was observed being worse in rural than in urban areas. The prevalence of stunting, wasting and underweight varied over the entire period according to the specific region in the country, stunting, wasting and underweight was found to be declining in Khulna division; by contrast, the prevalence of wasting was found to decline in Barisal division, But stunting and underweight were found to be high, indicating that the children of Barisal division were suffering more from chronic malnutrition them acute malnutrition. The trends in age specific child malnutrition indicate that, though the prevalence of both stunting and underweight for younger children (aged 12-59 months) declined over the period 1996-2004, the levels remained above the threshold of "very high" prevalence. Children aged 12-23 months were at greater risk of being malnourished in terms of all the three. Three forms throughout the whole period, for children whose mothers had no education or incomplete primary education, the level of stunting and underweight decreased but remained for above the household. Only for the children born to higher educated mothers, the prevalence of stunting, wasting and underweight fell below the threshold. These finding indicated that children of less educated mothers seriously suffer from all of three forms of malnutrition while higher education of women helps significantly to reduce the incidence of malnutrition. On the basis of these findings, the study suggested that special efforts are required to reduce the nutrition vulnerability among younger children, especially those aged 12-23 months. An appropriate strategy should be employed to educate people about the importance of balanced complementary food for infants over six months of age.

201 Eneroth H; Arifeen SE; Persson LA; Kabir I; Lonnerdal B; Hossain MB; Ekstrom EC. Duration of exclusive breast-feeding and infant iron and zinc status in rural Bangladesh. *The Journal of Nutrition*. 2009; 139: 1562-1567.

The aim of this analysis was to investigate the relation between duration of EBF and iron and zinc status in infancy. In here data from the MINIMat trial conducted in Matlab in rural Bangladesh, where community health research workers from the ICDDR,B visit households monthly to collect health and demographic data. Trained interviewers use a structured questionnaire to collect

socioeconomic and demographic information from the women at around wk 8 of gestation. The study assessed the association between duration of EBF and infant iron and zinc status in the maternal and infant nutrition interventions in Matlab trial Bangladesh, stratified for normal birth weight (NBW) and LBW. Duration of EBF was classified into EBF<4 mo and EBF 4-6 mo based on monthly recalls of foods introduced to the infant. Blood samples collected at 6 mo were analyzed for plasma zinc (n=1032), Plasma ferritin (n=1040), and hemoglobin (Hb) (n=791). Infants EBF 4-6 mo had a higher mean plasma zinc concentration (9.9±2.3 μmol/L) than infants EBF<4 mo (9.5±2.0 μmol/L) ($p<0.01$). This association was apparent in only the NBW strata and was not reflected in a lower prevalence of zinc deficiency. Duration of EBF was not associated with concentration of plasma ferritin, Hb concentration or prevalence of iron deficiency or anemia in any strata. Regardless of EBF duration, the prevalence of zinc deficiency, iron deficiency, and anemia was high in infants in this population and strategies to prevent deficiency are needed. Therefore, measures to be taken to increase iron and zinc status at birth could, together with appropriate infant feeding, prevent deficiency of iron and zinc in infancy.

202 Eneroth H; Arifeen SE; Persson LA; Lonnerdal B; Hossain MB; Stephensen CB; Ekstrom EC. Maternal multiple micronutrient supplementation has limited impact on micronutrient status of Bangladeshi infants compared with standard iron and folic acid supplementation 1-3. *The Journal of Nutrition*. 2010; 140: 618-624.

The study was undertaken to examine the effect of maternal food and micronutrient supplementation on infant micronutrient supplementation on infant micronutrient status in the maternal and infant nutrition interventions in Matlab trial. Pregnant women (n=4436) were randomized to early or usual promotion of enrollment in a food supplementation program. In addition, they were randomly allocated to 1 of the following 3 types of daily micronuclei supplements provided from wk 14 of gestation to 3 mo postpartum; 1) Folic acid and 30 mg iron; (Fe 30 Fol); 2) Folic acid and 60 mg iron; or 3) a multiple micronutrient including folic acid and 30 gm iron (MMS). At 6 mo, infant blood samples (n=1066) were collected and analyzed for hemoglobin and plasma ferreting, zinc, rational, vitamin B-12 and foliate. The vitamin B-12, concentration differed between the micronutrient supplementation groups ($p=0.049$). The prevalence of vitamin B-12 deficiency was lower in the MMS group (26.1%) than in the Fe30Fol group (36.5%) ($p=0.003$). The prevalence of zinc deficiency was lower in the usual food supplementation group (54.1%) than in the early differentia effects according to food or micronutrient supplementation groups. It concludes that maternal multiple micronutrient supplementations may have a beneficial effect on vitamin B-12 status in infancy. Regarding infant micronutrient status leads to these functional outcomes requires further analysis.

203 Faruque ASG; Ahmed AMS; Ahmed T; Islam MM; Hossain I; Roy SK; Alam N; Kabir I; Sack DA. Nutrition: basis for healthy children and mothers in Bangladesh. *J Health Popul Nutr.* 2008 Sep; 26(3):325-29

The report was written about recent data from the WHO showed that about 60% of all deaths, occurring among children aged less than five years (under-five children) in developing countries, could be attributed to malnutrition. The recent baseline survey by the National Nutrition Program (NNP) showed high rates of stunting, underweight, and wasting. However, data from the nutrition surveillance at the ICDDR, B hospital showed that the proportion of children with stunting, underweight, and wasting has actually reduced during 1984-2005. Inappropriate infant and young child-feeding practices (breastfeeding and complementary feeding) have been identified as a major cause of malnutrition. In Bangladesh, although the median duration of breastfeeding is about 30 months, the rate of exclusive breastfeeding until the first six months of life is low, and practice of appropriate complementary feeding is not satisfactory. Different surveys done by the

Bangladesh Demographic and Health Survey, United Nations Children's Fund (UNICEF), and Bangladesh Breastfeeding Foundation (BBF) showed a rate of exclusive breastfeeding to be around 32-52%, which have actually remained same or declined over time. The NNP baseline survey using a strict definition of exclusive breastfeeding showed a rate of exclusive breastfeeding (12.8%) until six months of age. Another study from the Abhoynagar field site of ICDDR, B reported the prevalence of exclusive breastfeeding to be 15% only. Considerable efforts have been made to improve the rates of exclusive breastfeeding. Nationally starting of breast feeding within one hour of birth, feeding colostrums, and exclusive breastfeeding have been promoted through the Baby-Friendly Hospital Initiative (BFHI) implemented and supported by BBF and UNICEF respectively. Since most (87-91%) deliveries take place in home, the BFHI has a limited impact on the breastfeeding practices. Results of a study in urban Dhaka showed that the rate of exclusive breastfeeding was 70% among mothers who were counseled compared to only 6% who were not counseled and another study in Bangladesh showed that peer-counseling given either individually or in a group improved the rate of exclusive breastfeeding from 89% to 81% compared to those mothers who received regular health messages only. This implies that scaling up peer- counseling methods and incorporation of breastfeeding counseling in the existing maternal and child heath program is needed to achieve the Millennium Development Goal of improving child survival. However, the adequacy, frequency, and energy density of the complementary food are in question. Remarkable advances have been made in the hospital management of severely-malnourished children. The protocol zed management of severe protein-energy malnutrition at the Dhaka hospital of ICDDR, B has reduced the rate of hospital mortality by 50%. Although the community nutrition centers of the NNP have been providing food supplementation and performing growth monitoring of children with protein-energy malnutrition, the referral system and management of complicated severely-malnourished children are still not in place.

204 Frith LA; Naved RT; Ekstrom EC; Rasmussen KM; Frongillo EA. Micronutrient supplementation affects maternal-infant feeding interactions and maternal distress in Bangladesh. ***American Journal of Clinical Nutrition.*** **2009; 90: 1-8.**

The study was carried out a randomized double-blind controlled trial in a rural community in Bangladesh to examine the effect of daily micronutrient supplements (30 mg Fe compared with 60 mg Fe, or 30 mg Fe iron compared with multiple micronutrients) in pregnant and early postpartum mothers on observed maternal-infant feeding interaction when infants were 3.4-4.0 month of age. The study examined differences in maternal-infant feeding interaction between 3 maternal pre-and postpartum micronutrient supplementation groups that differed in iron dose and inclusion of multiple micronutrients and determined whether any differences observed were mediated by maternal distress. A cohort of 180 pregnant women was selected from 3300 women in the randomized controlled trial Maternal Infant Nutritional Interventions Matlab, which was conducted in Matlab, Bangladesh. At 8 wk of gestation, women were randomly assigned to 1 of 3 groups to receive a daily supplement of micronutrients (14 wk gestation to 12 wk postpartum); 60 or 30 mg Fe each with 400μg folic acid or multiple micronutrients (MuMS; 30 mg Fe, 400μg folic acid, and other micronutrients). A maternal-infant feeding interaction was observed in the home when infants were 3.4-4.0 mo of age, and maternal distress was assessed. The results of the findings showed that compared with 30 mg Fe, 60 mg Fe decreased the quality of maternal-infant feeding interaction by ~10%. Compared with 30 mg Fe, MuMS did not improve interaction but reduced maternal early postpartum distress. Distress did not mediate the effects of micronutrient supplementation on interaction. For pregnant and postpartum women, micronutrient supplementation should be based on both nutritional variables (e.g. iron status) and functional outcomes (e.g. maternal-infant interaction and maternal distress). Recommendations for

micronutrient supplementation should be formulated considering effects on both nutritional variables (e.g. iron status) and functional outcomes (e.g. maternal-infant interaction and maternal distress).

205 Haque R; Ahmed T; Wahed MA; Mondal D; Rahman ASMH; Alber MJ. Low-dose β-carotene supplementation and de-worming improve serum vitamin A and B carotene concentrations in preschool children of Bangladesh. *J Health Popul Nutr*. 2010 June; 28(3):230-237.

This purpose of the present study was to investigate the impacts of low dose β-carotene supplementation and anti-helminthes therapy or serum retinol and β-carotene concentrations in preschool children of Bangladesh. The study was conducted among children of a slum community in Mirpur, Dhaka, Bangladesh. Preschool children aged 24-60 months, were enrolled from Mirpur. A list of all eligible children was prepared from the area. In total, 248 children of both sexes were selected from among the children with infection due to Aumbricoids After informed consent was obtained from the head of the household, trained Health Assistants using a standardized and pre-tested questionnaire regarding the health of the children, and interviewed the mothers of these children at their houses. The inclusion criteria for the study children were: (a) apparently healthy without a history of chronic illness; (b) without hookworm infection, and (c) willing to tale daily B carotene capsule and two doses of albendazole during the study. Samples were collected in wide mouthed plastic bottles for micros coppice examinations using a smear. The study team found that two hundred and forty four children, known to be infected with ascaris lumbricoiders, were randomized in to four treatment group: I-IV. Group I and II received two oral doses of 400 mg of albendazole each, the first dose at base live and the second dose after four months; group III and IV received placebo in place of albendazole. In addition, Group I and III received 1.2 mg of B- carotene powder in capsule daily for six months and Group II and IV received placebo in place of B- carotene. Serum retinol and B Carotene levels were measured before and after six months of the interventions. Serum retinol and B carotene increased significantly in Group I where both anti-helminthic therapy and daily B carotene supple mutation were given ($Ap<0.05$ and $p<0.001$ respectively). Antihelminthic therapy alone only improved serum B carotene concentration ($p<0.001$). Low dose B- carotene supplementation, along with an antihelminthic therapy, synergistically improved vitamin A status. The results of the study also indicated that the national programs for de-worming and vitamin A supplementation prophylaxis, along with other food based interventions that will provide precursors of vitamin A may be useful in improving the vitamin A status of preschool children where both vitamin A deficiency and high prevalence of intestinal helminthes exist. However this presumption now needs to be tested because this study used synthetic B carotene.

206. Hossain MA; Bhuyan MAH. Household food security and nutritional status of under-two children: a comparative study between a selected NNP area and a non-project area. *South Asian Journal of Population and Health*. 2009 July; 2(2): 109-121.

The purpose of this study was to investigate the nutritional status of under two children in a project and non-project area and to compare them and also to investigate relationship between household food security and nutritional status and risk factors influencing the nutritional status of under two children in both project and non-project area. The cross-sectional comparative study was conducted in Muradnagar upazilla of Camilla district to compare the nutritional status of children (0-23 months) drawn from households participating in a NNP project vis-à-vis another non-project area. A total of 240 households, of which 120 were from the NNP project area with

children aged between 0-23 months were randomly selected. Indices of nutritional status that is weight-for-age, length-for-age and weight-for-length were computed using the WI-IO/NCHS Anthrop program. The prevalence of underweight (<-2SD) in the project area (35.8%) was found slightly lower than the non-project area (39.2%) with severe underweight being 5.0% vs. 7.5% respectively. Within the project sample, 32.5% children were stunted (<-2SD) with 11.7% being severely stunted while in non-project area these figures were 33.3% and 7.5% respectively. On the other hand, 17.5% children were wasted (<-2SD) with 2.5% being severely wasted in project area while in the non-project area these figures were 19.2% & 1.7% respectively. All these differences were statistically insignificant (Pearson chi-square test) indicating no measurable impact of this high cost NNP on nutrition of the children. Pearson chi-square test shows a significant association between the children's age and dietary diversity with their nutritional status based on the prevalence of wasting and of underweight (p<while nutritional status, based on stunting, was significantly associated with level of household food security. The results indicate that the large scale operational research is thus suggested to adopt those findings for the whole NNP areas. Overall, the study suggests that the operational structure of NNP should be revisited to make the program more effective, given its high cost on loan money.

207 Islam MM; Khatun M; Peerson JM; Ahmed T; Mollah MAH; Dewey KG; Brown KH. Effects of energy density and feeding frequency of complementary foods on total daily energy intakes and consumption of breast milk by healthy breastfed Bangladeshi children 1-3. *Am J Clin Nutr*. 2008; 88: 84-94.

The aim of the study was to evaluate the effects of various energy densities and feeding frequencies of complementary foods on EI from these foods, breast milk consumption, and total EI from both sources. During 9 separate, randomly ordered dietary periods lasting 3-6 d each, the study measured intakes of food and breast milk by 18 healthy breastfed children 8-11 mo of age who, 3, 4, or 5 times/d, were fed porridge with a coded energy density of 0.5, 1.0, or 1.5 kcal/g. Food intake was measured by weighing the feeding bowl before and after meals, and breast milk intake was measured by test weighing. The study results revealed that mean amounts of complementary foods consumed were inversely related to their energy density and positively related to the number of meals/d (p<0.001 for both); EIs from foods were positively related to both factors. Breast milk intake decreased slightly but progressively, with greater energy density and feeding frequency of complementary foods; total EIs (kcal/d) increased in relation to both factors (p<0.001 for both).The energy density and feeding frequency of complementary foods affect infants' total daily EI and breast milk consumption. Thus, it can be suggested that the appropriate combinations of these dietary factors that are compatible with adequate EI, although longer-term effects of complementary feeding practices on breast milk intake and breastfeeding duration need further community-based studies.

208 Karim R; Khan NI; Akhtaruzzaman M. Environmental hygiene and sanitation in a Bangladesh national nutrition program area: the case in Bhanga Upazial. *Bangladesh Journal of Nutrition.* 2007-2008 Dec; 20-21: 25-32.

The main objective of the study was to assess the mothers' knowledge and practice of improved hygiene cares in an NNP area. The report about a statistically selected representative sample of households in Bhanga Upazila. Data were collected in April 2005 from a statistically selected representative sample of 528 households by the researchers themselves by personal interview of the mothers using a pre-tested questionnaire. In this study, the results showed that a large number of the mothers knew at least one hygienic care, fewer mothers knew all' hygienic cares and substantial gaps existed between knowledge and practice for most of the hygienic cares studied.

Inaccessibility of facilities, high costs and lack of knowledge and motivation were the common reasons for wrong practice. Literate mothers were twice more likely to know and almost thrice more likely to practice all the hygienic cares compared to the illiterate mothers. Mothers having literate husbands were almost twice more likely to know all the hygienic cares compared to those having illiterate husbands and mothers who knew all the hygienic cares were five times more likely to practice them compared to those who did not know them. A part from increased facilities a strong information and motivation campaign aimed at would result in improved knowledge and practice of all hygiene cares realizing the full potential of NNP. Mother's literacy and husband's literacy substantially improved the mother's knowledge of all hygienic cares and mother's literacy and mother's knowledge of all hygienic cares substantially improved their practice of all hygienic cares. The frequency of mother's participation in NNP sessions had no impact on their knowledge of all hygienic cares. This implies that hygienic cares and their benefits should be discussed with greater emphasis in NNP sessions to realize the full potential of NNP.

209 Khalil MI; Baki AA; Akhter N; Azad MASA; Zafreen F; Wahab MA. Magnesium supplementation of children with severs protein energy malnutrition. *Public Health Nutrition*. 2009; IP address 158.232.240.

This study was conducted to determine the clinical outcome of magnesium supplementation in severely malnourished Bangladeshi children. This hospital based prospective case control study was carried out in the Department of Pediatrics, Dhaka Bangabandhu Sheikh Mujib Medical University (BSMMU) and ad-din Hospital, Dhaka from June 2006 to December 2006. Total sixty children, divided into two equal groups, were included in the study. Group I patients were given standard treatment of protein energy malnutrition (PEM) and Group-II children were given magnesium supplementation in addition. Serum magnesium level was measured on day-1 and day-12 of admission. Pre-treatment clinical parameters of both groups were comparable. In this study, principal clinical findings were diarrhea, vomiting, poor appetite, irritability, hypotonia and edema. Serum magnesium level was low in severely malnourished children. Magnesium supplemented group of patients showed better improvement of appetite reduction of vomiting and hypotonea. In this study mean serum magnesium levels were 1.46 $\pm$ 0.25mg/dl in group I and 1.36 $\pm$ 0.25 mg/dl in group II a day I before starting treatment. These levels were below normal value of 1.56 mg/dl after treatment a day 12 these were 1.63 $\pm$ 0.26 mg/dl and 2.06$\pm$0.33 mg/dl in group I and group II respectively). The rate of weight gain was 8.87$\pm$3.51 gm/kg/day in group-I and 12.16$\pm$6.32 gm/kg/day in group-II, which was statistically significant. So, therefore, magnesium may be routinely used in management of malnourished children to hasten recovery.

210 Khan TI; Kabir A; Hoque M; Faruquee MH ; Karim MN ; Chaklader MA ; Mowlah G. Nutritional and hematological status of under-5 children attending tertiary level hospitals in Dhaka city. *SUBJPH*. 2009; 2(1): 29-34.

This was a cross sectional study to assess the nutritional and hematological status of fewer than 5 Children among 305 subjects attending in the department of Pediatrics of three tertiary level hospitals in Dhaka. The study was done from March 2004 to December 2005. In this study hematological assessment was done by full blood count, iron profile, Hb-electrophoresis and in selective cases bone marrow iron stain, zinc protoporphyrin, stir were done. All findings were recorded in structured forms and bivariate analysis was done. The findings showed that the subjects were 54.10% male and 45.90% female. Highest number (27.43%) of respondents (mothers) had only primary level of education, 14.29% mothers and 13.14% fathers had no formal education, and 40.57% had no knowledge about protective food. Around 74.75% had growth retardation and prevalence of underweight, wasting and stunting were 52.63%, 05.26% and 42-

.ll% respectively. All subjects were categorized into four groups on hematological assessment. Group-I (27.87%) non-anemic; Group-Il (26.89%) normocytic anemic; Group-Ill (3 6.07%) iron deficiency anemic and Group-IV (9.18%) were hereditary hemolytic anemic. Age group 1-2 years showed highest (31.82%) percentage of iron deficiency anemia. Hb-E trait cases were highest (03.28%) and Hb E-β -thalassemia cases were lowest (01.31%). The 13-thalassemia trait and the Hb-E disease cases were equal and it was 2.30 % respectively. Estimation of nutritional status and proper etiologically differentiation of anemia of under-5 children is very much essential because deficiencies anemia and hemolytic trait concurrently occur in a same child and it is necessary after correction o deficiency anemia to detect carrier by in-depth and sophisticated investigations. Treatment with iron therapy is only rational if their body is deficit of iron, otherwise it is irrational.

211 Khatun S; Rahman M. Socio-economic determinants of low birth weight in Bangladesh: a multivariate approach. *BMRC Bulletin.* 2008 Dec; 34(3): 81-86.

The present study high lightened selected independent factors of LBW through multiple regression analysis and thus would have contributed in reducing the incidence of low birth weight by giving more attention to them. Samples were selected purposively. Information collected from the mothers through face to face interview by structured interview form. One hundred and eight LBW babies were compared with 357 normal birth weight babies. Out of 20 possible risk variables analyzed, it was found significant when studied separately. Mothers age education. Occupation, yearly income gravid status, gestational age at first visit, number of antenatal care visit attended, quality of antenatal care received and pre-delivery body mass index had significantly associated with the incidence of LBW. Using the stepwise logistic regression, mother's age ($p<0.00$), education ($P<0.0$), number of antenatal care visit attended ($P<0.001$, OR=3.379) created the best model, which predicted 86.1% and 94.4% of the LBW babies and normal birth weight babies respectively. Maternal age, educational level and economic status play an important role in the incidence of low birth weight. This study suggests that there are several factors interplaying which lead to LBW babies. Socio-demographic factors (maternal age, educational level and economic status) and quality of antenatal visit (in terms of contains and number) are more important.

212 Majumder UK; Islam MN; Paul DNR. Socioeconomic determinants of malnutrition of children aged 6-71 months in two selected districts of Bangladesh. *South Asian Journal of Population and Health*. 2008 July; 1(2): 107-124.

The study aim was to investigate the geographical impact on the socio-demographic and socioeconomic characteristics of the households and their effects on malnutrition of the children aged 6-71 months in the two selected areas of Bangladesh. The current status of malnutrition among the children aged 6-71 months was assessed in two selected districts of Bangladesh, namely, Dinajpur (a rice surplus district) and Bagerhat (a rice deficit district). A three-stage cluster sampling technique was used for selecting the sample households for each selected district. The prevalence of malnutrition was assessed using three indicators, such as stunting, under-weight, and wasting, following the WHO guidelines and cut-off points. The prevalence of stunting, under weight and wasting of 6-71 months children in Dinajpur were lower than those in Bagerhat. The households of Dinajpur district are relatively richer, live comparatively better life, and the children possess better nutritional and health status as compared to Bagerhat district. Age of mother and socio-economic status (SES) of the households has been identified as the main contributing factors for stunted children in Dinajpur district while, age of children, mother's working status and SES of households appear to be the major contributing factors to the stunted children in Bagerhat. 'The factors showing significant contribution to underweight children are

age of children, age of mother, family size, households monthly income and poverty incidences in Dinajpur and age of children, credit receiving status. Monthly income from agriculture and household's per capita monthly expenditure in Bagerhat district. The contributing factors for wasted children were family size and motherly income of the households in Dinajpur district while, there was no significant factors found in Bagerhat. The study suggested that socioeconomic status, education of mothers and health environment of the households should be improved. Both GO and NGO initiatives should be geared up to identify and introduce non-farm employment opportunity.

213 Mehjabeen SS; Mohiduzzaman M; Banu CP; Shaheen N. Comparison of iodine status between adult and adolescent pregnant women at a maternity hospital in Dhaka City. *Bangladesh Journal of Nutrition.* 2007-2008 Dec; 20-21: 33-40.

The aim of this study was to describe and compare the magnitude and severity of IDD among adolescent and adult pregnant mothers in Bangladesh. A cross-sectional study was conducted among adolescent and adult pregnant women (n=210) during the months of July 2006 to September 2006. Maternal urinary iodine excretion (UIE) was determined (n =210) together with estimation of salt iodine content (n =87) of the consumed salt sample collected. Data was analyzed using SPSS var. 12. The study found that a considerable number of adolescent (21.8%) and adult (21.9%) pregnant mothers were suffering from iodine deficiency (UIE <100 µg/L), although there was no significant difference in iodine deficiency among these two groups (p =0.74) and between age and gestational age of the respondents. The overall median urinary iodine levels were 176.6 and 191.5 µg/L in adolescent and adult pregnant mothers respectively. About 30.0% of the respondents had U greater than 300 µg/L and 16.7% of the respondents had UIE within the range of 200-299.9 µg/L. Salt intake shows a large variation in iodine content (the minimum and maximum values were 15.2 and 64.3 mg/kg for adolescent group and 9.1 and 104.7 mg/kg for adult group) and significant correlation (Spearman's rho, P<0.05) was found between UIE (µg/L) and salt iodine intake (mg/kg). Therefore, findings of the present study suggest that biochemical iodine deficiency persist among the adult and adolescent pregnant mothers, though the median urn level falls within the optimal iodine nutrition status. Significant association was found between salt iodine intake and urinary iodine excretion. So further research involving longitudinal follow up of adolescent and adult pregnant mothers is needed to elucidate the true picture.

214 Mirshahi S; Kabir I; Roy SK; Agho KE; Senarath U; Dibley MJ. Determinants of infant and young child feeding practices in Bangladesh: secondary data analysis of Demographic and Health Survey 2004. *Food and Nutrition Bulletin*. 2010; 31(2): 295-313.

The study was undertaken to estimate the determinants of selected feeding practices and key indicators of breastfeeding and complementary feeding in Bangladesh. The sample included 2,482 children aged 0-23 months from the Bangladesh Demographic and Health Survey of 2004. The World Health Organization (WHO) recommended infant and young child feeding indicators were estimated, and selected feeding indicators were examined against a set of individual, household, and community-level variables using univariate and multivariate analyses. The study findings revealed that only 27.5% of mothers initiated breastfeeding within the first hour after birth, 99.9% had ever breastfed their infants, 97.3% were currently breastfeeding, and 22.4% were currently bottle-feeding. Among infants under 6 months of age, 42.5% were exclusively breastfed, and among those aged 6 to 9 months, 62.3% received complementary foods in addition to breast milk. Among the risk factors for an infant not being exclusively breastfed were higher socioeconomic

status, higher maternal education, and living in the Dhaka region. Higher birth order and female sex were associated with increased rates of exclusive breastfeeding of infants under 6 months of age. The risk factors for bottle-feeding were similar and included having a partner with a higher educational level (OR= 2.17), older maternal age (OR for age $\geq$ 35 years= 2.32), and being in the upper wealth quintiles (OR for the richest = 3.43). Urban mothers were at higher risk for not initiating breastfeeding within the first hour after birth (OR-1.61). Those who made three to six visits to the antenatal clinic were at lower risk for not initiating breastfeeding within the first hour (OR= 0.61). The rate of initiating breastfeeding within the first hour was higher in mothers from richer households (OR= 0.37). Most breastfeeding indicators in Bangladesh were below acceptable levels. Breastfeeding promotion programs in Bangladesh need nationwide application because of the low rates of appropriate infant feeding indicators, but they should also target women who have the main risk factors, i.e., working mothers living in urban areas like Dhaka.

215 Moore SE; Prentice AM; Coward WA; Wright A; Frongillo EA; Fulford AJC; Mander AP; Persson LA; Arifeen SE; Kabir I. Use of stableisotop techniques to validate infant feeding practices reported by Bangladeshi women receiving breastfeeding counseling 1-3. The *American Journal of Clinical Nutrition*. 2007; 85: 1075-82.

The aim of this study was to validate reported infant feeding practices in rural Bangladesh; intake of breast milk and non-breast milk water were measured by the dose given to the mother deuterium dilution-technique. Subjects were drawn from the large-scale Maternal and Infant Nutrition Interventions, Matlab, study of combined interventions to improve maternal and infant health, in which women were randomly assigned to receive either exclusive breastfeeding counseling or standard health care messages. Data on infant feeding practices were collected by questionnaire at monthly visits. Intakes of breast milk and non-breast milk water were measured in a sub-sample of 98 mother-infant pairs (women infant age: 14.3 wk) and compared with questionnaire data reporting feeding practices. The study results revealed that seventy-five of the 98 subjects reported exclusive breastfeeding. Mean (± SD) breast milk intake was 884 ± 163 ml/d in that group and 791 ± 180 ml/d in the group reported as non-exclusive breastfeeding (p=0.0267). Intakes of non-breast milk water were 40 ± 80.6 and 166 ± 214 ml/d (p< 0.000), respectively. Objective cross validation using deuterium dilution data showed good accuracy in reporting of feeding practices, although apparent misreporting was widely present in both groups. In summary, the study results showed that the dose-to-mother deuterium dilution technique can be used to measure breast milk and non-breast milk water intakes in populations living in rural Bangladesh. The present suggested, however, that the estimated error in measurement, although small enough to allow discrimination between the exclusive and partial categories, is not adequate to distinguish between exclusive and predominant categories in individual infants.

216 Nahar B; Hamadani JD; Ahmed T; Tofail F; Rahman A; Huda SN; Grantham-McGregor SM. Effect of psychosocial stimulation on growth and development of severely malnourished children in a nutrition unit in Bangladesh. *European Journal of Clinical Nutrition.* 2009; 63: 725-771.

The aim of the study was to incorporate stimulation into the routine treatment of severely malnourished children in a nutrition unit and evaluate the impact on their growth and development. It was a time-lagged controlled study. Severely malnourished children, aged 6-24 months, admitted to the NRU were enrolled. All received standard nutritional care. A control group of 43 children was studied initially, followed by an intervention group of 54 children. The intervened mothers and children participated in daily group meetings and individual play sessions

for 2 weeks in hospital and were visited at home for 6 months. Children's growth was measured and development assessed using the Bailey Scales of Infant Development. Findings of the study revealed that twenty-seven children were lost to the study. In the remaining children, both groups had similar developmental scores and anthropometry initially. After 6 months, the intervention group had improved more than the controls did by a mean of 6.9 (p<0.001; 95% CI: 3.9, 10.0) mental and 3.1 (P=0.024; 95% CI: 0.4, 5.7) motor raw scores and a mean of 0.4 (P=0.029; 95% CI: 0.1, 0.8) weight-for-age z scores, controlling for background variables. Psychosocial stimulation integrated into treatment of severely malnourished children in hospital, followed by home visits for 6 months, was effective in improving children's growth and development and should be an integral part of their treatment. The results suggest that not only should play and maternal education be added to hospital treatment but also longer term intervention with home visits should be implemented.

217 Rahim ATMA; Moushumi S; Khan N; Consumption behavior and nutrient quality of fast foods: development of a healthy eating index Bangladesh consumers. *South Asian Journal of Population and Health* 2008 June; 1(2): 137-147.

The present study investigated and evaluated the perception, preference and intake pattern of western fast food (WFP) and traditional snack foods (TSF) among customers of some selected commercial fast food outlets in Dhaka city. Four hundred consumers of these foods were interviewed (56.5% male, 43.5% female) with structured questionnaire. Findings showed that consumption of western fast foods became one of the common food behaviors of the young of 15 to 29 years of age (85.5% of the respondents). The majority of the respondents (43%) rated these foods as tasty food. Soft drinks (6.2% of total citations) and burger (6% of total citations) were the two top most foods prefer besides snacking, 39.2% respondents combined "Biriani" with soft drinks as their lunch. The perceived role of these foods in health and disease varied widely. Seven percent of the respondents opined that these foods could cause coronary heart diseases. A healthy eating index of these foods using secondary food composition data was then constructed to guide the consumers for a healthier choice. Nutrient contents of selected foods were compared with dietary reference intake and scored on a 0-5 point scale for each of the five selected nutrient components viz., total fat, saturated fat, cholesterol, dietary fiber, and sodium. Depending on the total score, the foods were ranked as 'Safe', 'Fair', 'Caution' and 'Risky' in the context of dietary intake and risk of non-communicable diseases. Half of the foods studied were found in 'caution' category for healthy eating. The index developed may, therefore, be a useful tool for Bangladeshi urban consumers for a healthier choice of these foods.

218 Raqib R; Alam DS; Sarker P; Ahmad SM; Ara G; Yunus M; Moore SE; Fuchs GJ. Low birth weight is associated with altered immune function in rural Bangladeshi children: a birth cohort study. *Am J Clin Nutr*. 2007; 85: 845-52.

It was an aim to investigate the effect of birth weight on immune function in preschool-age children. A birth cohort cross-sectional study was conducted in children (n=132) aged 60.8±0.32 mo who were born in Matlab, rural area of Bangladesh, and whose weight and length were measured within 72 h of birth. The outcome measures were thymopoiesis, T cell turnover, acute phase response, and percentage of lymphocytes. The study results revealed that children born with low birth weight (<2500 g; LBW group, n = 66) had significantly higher concentrations of T cell receptor excision circles in peripheral blood mononuclear cells—a biomarker for thymopoiesis—and significantly higher serum bactericidal activity and C-reactive protein concentrations than did children borne with normal birth weight (≤ 2500 g; NBW group, n =66) (p<0.05 for both). The LBW group children had significantly lower concentrations of interleukin 7 in plasma (p=0.02),

shorter telomere length in peripheral blood mononuclear cells (*P*=0.02), and a lower percentage of CD3 T cells (*P*=0.06) than did the NBW group children. Therefore greater peripheral T cell turnover due to immune activation may have resulted in a greater need for replenishment from the thymus; these events may cause lower immune functional reserve in preschool-age children born with LBW. So, LBW has implications for immune-competence and increased vulnerability to infectious disease in later life.

219 Rasheed S; Frongillo EA; Devine CM; Alam DS; Rasmussen KM. Maternal, infant, and household factors are associated with breast-feeding trajectories during infants first 6 months of life in Matlab, Bangladesh. *The Journal of Nutrition*. 2009 Jun; in, nutrition org.

The objective of this study was to examine the household maternal and infant level characteristics of women following the 3 breast feeding trajectories. The researchers used results from a prior qualitative study to define majority for feeding during the first half of infancy and them examined household, maternal and infant level determinants of these trajectories using logistic regression analysis. The 1472 women in the study cohort lived in rural Bangladesh and were participants in the Maternal and infant nutrition, Intervention in Matlab trial. The 3 infant feeding trajectories included women who fed only breast milk and water full breast feeding trajectory (FBT); offered mixed feeding continuously when their babies were 4 month old continuous mixed feeding trajectory (CMFT); and practiced any other type of breast-feeding intermittent feeding trajectory (IFT) which was the normative feeding behavior in this community, Mother in the IFT mostly parodied EBF from 1-4 month and then partial breast feeding increased dramatically. Mothers in the CMFT increasingly practiced partial breast feeding from 1-3 month. Living in the richest households, maternal employment, and lower infant birth weight were associated with higher odds of being in the CMFT. In the final model in addition to the factors identified previously, maternal age reached significance. Older mothers have higher odds of being in the CMFT. In the analysis, it showed that the message of exclusively grease feeding and infant has not adequately reached the community. It is possible that reaching the mothers with support related to how to prolong EBF during 3-4 moths will be needed to change the normative feeding practice in Matlab. The study results suggested that in future studies, the impact of breast feeding trajectories on the morbidity and growth of infants should be studied.

220 Roy SK; Jelly SP; Shafique S; Fuchs GJ; Mahmud Z; Chakraborty B; Roy S. Prevention of malnutrition among young children in rural Bangladesh by food-health care educational intervention in a randomized, controlled trial. *Food and Nutrition Bulletin*. 2007; 28(4): 375-383.

The major objective of this work was to explore the effectiveness of a nutrition education package to prevent malnutrition among young children. The study used a community-based, randomized, controlled trial among 605 normal and mildly malnourished children aged 6 to 9 months in 121 Community Nutrition Centre (CNC) of the BINP in four regions of Bangladesh from 2000 to 2002. The intervention group received weekly nutrition education based on the nutrition triangle concept of UNICEF for 6 months, whereas the control group received regular BINP services. Both groups were observed for a further 6 months to assess the sustainability of the effects. Information on socio-economic status, feeding patterns, morbidity, and anthropometric feature was collected. The results showed that a significant increase in the frequency of complementary feeding was observed in the intervention group as compared with the control group, and the increase was sustained throughout the observation period. The intervention group had a higher weight gain than the control group after the end of the intervention (0.86 vs. 077 kg, p=0.053) and

after the end of observation period (1.81 vs. 1.39 kg, p<.001). The proportion of normal and mildly malnourished children was greater in the intervention group than in the control group after the end of the observation (88.9% vs. 61.5%, p<.001). Nutrition education successfully prevented malnutrition in all the areas. Variation in the outcome of nutrition education among the regions was observed. The results of the study suggested that with 6 months of nutrition education, it is possible to prevent malnutrition and growth faltering among high risk young infants using the family's own resources. Such education should be incorporated into primary heath care and nutrition services in Bangladesh and in other settings with high rates of childhood malnutrition.

221 Sack DA. Achieving the millennium development goals for health and nutrition in Bangladesh: key issues and interventions -an introduction. *J Health Popul Nutr*. 2008 Sept.; 26(3): 253-260

Among the mega-countries, Bangladesh stands out in terms of the density of population. As opposed to other countries with a population exceeding 100 million, the density of population in Bangladesh is more than twice the density of other populous countries, and the population continuous to grow. Bangladesh is only half way up the population curve such that, during the next 50 years, the difference in density between Bangladesh and other countries will widen even further. The cartograms illustrate the fact that Bangladesh is not a small country but is one where many people live, where many pregnant women need care, where children are being born, and where too many are dying. Among the countries of the world, Bangladesh, with about 340,000 childhood deaths per year, ranks number seven. Other countries with more childhood deaths are: India, Nigeria, China, Pakistan, DR Congo, and Ethiopia, Afghanistan, Tanzania, and Indonesia are in the list of 10 countries with the most number of childhood deaths. The papers that follow describe some health issues facing Bangladesh but focus on those issues that are especially relevant to achieving the MDGs, including child health, maternal health, poverty and nutrition, and infectious diseases. In some respects improvements in some health indicators have been remarkable, especially in reducing fertility, reducing under-five mortality, providing vaccines to children and mothers, reducing vitamin A deficiency, and others. Since reducing maternal mortality is a priority for the ministry of Health and Family Welfare (MOHFW), there are plans to train many more skilled birth attendants. However, according to calculations of ICDDR, B, the current plants will not meet the demand for skilled birth attendants during the coming decade, especially if the current plan of emphasizing deliveries at home is continued. An alternative strategy of facility-based deliveries in which practice of skilled birth attendants as a group with close connections to upazila-level emergency obstetrical care is more likely to rapidly meet the needs of the mothers of Bangladesh. Infectious diseases remain as major problems in Bangladesh. Although mortality from diarrhoeal diseases has decreased remarkably, mortality from pneumonia has not improved significantly. The success in the management of diarrhea is a major achievement for Bangladesh and for the partners that facilitated this, including the MOHFW, ICDDR, B, BRAC, USAID, and the social Marketing Company. Nearly all families know and use ORS appropriate – a situation much different from other developing countries. Success in improving micronutrient deficiency has been missed. The vitamin A program has been extremely successful, and its coverage improved remarkably when it was integrated with the national immunization days. Clinical vitamin A deficiency is now rarely seen, although serum levels remain low, especially in children aged over five years who do not receive vitamin A through the national program. Domestic violence is a public-health topic that is rarely discussed, yet it must be included in this volume because of its crucial importance to the women and families of Bangladesh. The Government of Bangladesh has made elimination of violence among intimate partners a priority, and a recent multi-country study carried out by the WHO has documented just

how common and damaging this problem is, not just in Bangladesh, but globally. Over half of adult women in Bangladesh are victims of violence from intimate partners, and these women and their children suffer many health and emotional consequences from this abuse. Achieving MDG 1, 4, 5 and 6 will be a challenge for Bangladesh. This will require a coordinated effort to improving health services for mothers and children, improving health services for mothers and children, improving nutritional status, reducing the burden of infectious diseases, and using modern technologies in a cost-effective manner.

222 Saha KK; Frongillo EA; Alam DS; Arifeen SE; Persson LA; Rasmussen KM. Household food security is associated with infant feeding practices in rural Bangladesh. *Journal of Nutrition*. 2008; 138: 1383-1390.

The study investigated the association between household food security (HHFS) and infant feeding practices (IFP) in rural Bangladesh using longitudinal data and appropriate statistical techniques for longitudinal data analysis. The study was taken into care of 1343 infants born between May 2002 and December 2003 in the Maternal and Infant Nutrition Intervention in Matlab study to investigate the effect of HHFS on IFP in rural Bangladesh. It measured HHFS using a previously developed 11-item scale. Cumulative and current infant feeding scales were created from monthly infant feeding data for the age groups 1-3, 1-6, 1-9 and 1-12 mo based on comparison to infant feeding recommendations. They used lagged, dynamic, and difference longitudinal regression models adjusting for various infant and maternal variables to examine the association between HHFS and changes in IFP, and Cox proportional hazards models to examine the influence of HHFS on the duration of breast-feeding and the time of introduction of complementary foods. Better HHFS status was associated with poor IFP during 3-6 mo but was associated with better IFP should target mothers in food-secure households when their babies are 306 mo old and also mothers in food-insecure households during the 2nd half of infancy. The study results provided strong evidence that HHFS influences IFP in rural Bangladesh. Therefore, efforts should be made by all mothers in food-insecure households to support recommended IFP in this population.

223 Saha KK; Frongillo EA; Alam DS; Arifeen SE; Persson LA; Rasmussen KM. Appropriate infant feeding practices result in better growth of infants and young children in rural Bangladesh [1-3]. *Am J Clin Nutr*. 2008;87: 1852-9.

The study was initiated to evaluate the effects of following current infant feeding recommendations on the growth of infants and young children in rural Bangladesh. The prospective cohort study involved1343 infants with monthly measurements on infant feeding practices (IFPs) and anthropometry at 17 occasions from birth to 24 mo of age to assess the main outcomes of weight, length anthropometric indexes, and under nutrition. We created infant feeding scales relative to the infant feeding recommendations and modeled growth trajectories with the use of multilevel models for change. The results of the study showed that the mean (+SD) birth weight was 2697 $\pm$ 401 g; 30% weighed <2500g. Mean body weight at 12 and 24 mo was 7.9$\pm$ 1.1 kg and 9.7$\pm$1.3 kg, respectively. More appropriate IFPs were associated ($p<0.001$) with greater gain in weight and length during infancy. Prior IFPs were also positively associated ($p<0.005$) with subsequent growth in weight during infancy. Children who were in the 75th percentile of the infant feeding scales had greater ($p<0.05$) attained weight and weight-for-age z scores and lower proportions of underweight compared with children who were in the 25th percentile of these scales. These results provide strong evidence for the positive effects of following the current infant feeding recommendations on growth of infants and young children.

Efforts should also be made to improve the SES and food security to ensure adequate resources and food for infant feeding and health care. Effective intervention programs should be developed to help address the burden of under-nutrition in Bangladesh.

224 Saha KK; Frongillo EA; Alam DS; Arifeen SE; Person LA. Use of the new World Health Organization child growth standards to describe longitudinal growth of breastfed rural Bangladeshi infants and young children. *Food and Nutrition Bulletin*, 2009; 30(2): 137-143.

The aim of this study was to examine and compare the growth of breastfed rural Bangladeshi infants and young children based on the new WHO child growth standards and the NCHS reference. The study was conducted by following 1,343 children in the Maternal and Infant Nutrition Intervention in Matlab (MINIMat) study from birth to 24 months of age. Weights and lengths of the children were measured monthly during infancy and quarterly in the second year of life. Anthropometric indices were calculated using both WHO standards and the NCHS reference. The growth pattern and estimates of under nutrition based on the WHO standards and the NCHS reference were compared. The study results indicated that the mean birth weight was 2,697 $\pm$ 401 g with 30% weighing <2,500g. The growth pattern of the MINIMat children more closely tracked the WHO standards than if did the NCHS reference. The rates of stunting based on the WHO standards were higher than the rates based on the NCHS reference throughout the first 24 months. The rats of underweight and wasting based on the WHO standards were significantly different from those based on the NCHS reference. This comparison confirms that use of the NCHS reference misidentifies under-nutrition and the timing of growth faltering in infants and young children, which was a key retinol for constructing the new WHO standards. The new WHO child growth standards provide a benchmark for assessing the growth of breastfed infants and children. The study results suggested that there are significant differences in the estimates of under weight, starting and wasting and the apparent timing of growth faltering when WHO standards are used instead of the NCHS reference.

225 Saha KK; Frongillo EA; Alam DS; Arifeen SE. Household food security is associated with growth of infants and young children in rural Bangladesh. *Public Health Nutrition* 2009; IP address: 158.232.240.36 (http: Journals. Cambridge prg: 1-7.

The purpose of the present research was to investigate the association between household food security and subsequent growth of infants and young children in rural Bangladesh. The study followed 1343 children from birth to 24 months of age who were born in the Maternal and Infant Nutrition Intervention in Matlab (MININat) study in rural Bangladesh. A food security scale was created from data collected on household food security from the mothers during pregnancy. Data on weight and length were collected monthly in the first year and quarterly in the second year of life. Anthropometric ideas were calculated relative to the 2006 WHO child growth standards. All statistical analyze was done using the mixed model procedure in the SPSS. The study showed that household food security was associated ($p<0.05$) with greater subsequent weight and length gain in this cohort. All end weight, length and anthropometric indices from birth to 24 months were higher ($p<0.001$) among these who were in food secure households. Proportion of underweight and stunting were significantly ($p<0.05$) lower in food secure households. Mean birth weight and birth length of the newborns was 2697 (sd-401) g and 47.8 (SD 2.1) cm respectively. Mean birth weight of boys (2741) {SD 411) g) was greater ($p<0.001$) than that of girls (2650 (SD 384) g). Men birth length of boys and girls was 48.0 (Sd 84) cm, 47.5 (sd 14)} respectively ($p<80.001$), Overall 30% of the babies were born with low birth weight (<2500g). The children were small for

age from birth to 24 months. Attained body weight at 6, 12 and 24 months was 6.7 (SD 0.9) kg. 7.9 (Sd 1.1) kg and 9.7 (Sd 1.3) kg, respectively. Household food insecurity has both short and long term nutritional consequences for caregivers, As a result of these management strategies, there could be compromised maternal nutrition that would ultimately influence infant care behavior, including infant feeding. These results suggests that household food security's is a determinant of child growth in rural Bangladesh, and that it may be necessary to ensure food security of these poor rural households to prevent highly prevalent under nutrition in this population in similar settings else where in the world.

226 Streatfield PK; Karar ZA. Population challenges for Bangladesh in the coming decades. *J Health Popul Nutr*. 2008 Sep; 26(3): 261-272.

In this paper, the authors intended to make demographic scenario of Bangladesh in a nutshell which means the population of this country may be put into the challenges in the coming decades. Bangladesh currently has a population approaching 150 million and will add another 100 million before stabilizing, unless fertility can soon drop below replacement level. This level of fertility decline will require a change in marriage patterns, which have been minimal so far, even with increasing female schooling. It would also benefit from a long-awaited shift to long-tern contraception. In addition to the consequence of huge population size, the density of population is already five times that of any other `mega' country (>100 million), a very challenging situation for an agricultural society. Most of the future growth will be urban, increasingly in slums. Numbers of young people will not increase, but numbers of older people will increase 10-fold this century, creating a large burden on the health system, especially for chronic illnesses. High density of population means that agricultural land is virtually saturated, with very limited capacity to expand food production. Climate change may have dramatic impacts on agriculture, through flooding and drought resulting from weather changes and geopolitical influences on trans-border river side. Rising sea-levels and consequent salinity will affect crops and require shifts to alternative land use. Serious long-term planning is needed for meeting the growing needs of the population, both for distribution and consumption.

227 Tasnim S; Afroza S; Rahman F. Effect of supplementation on weight gain of growth faltered under 2 children in a rural area of Bangladesh. *Journal of Bangladesh College of Physicians and Surgeons*. 2007 Sept; 25(3):121-124.

The present study was conducted to assess the effect of different length of supplementation on weight gain and to identify an optimum duration of supplementation for growth faltered children. It was a longitudinal perspective study confirmed among 510 children aged 6-23 months enrolled for food supplementation from 1st November 1998 to 30th May 1999 under community based food supplementation program of BINP. The children were assigned in 3 groups of supplementation for 30, 60 and 90 days. All children were assessed for graduation (weight gain 500 gm) at assigned deviation of supplementation and followed for 90 days with monthly anthropometric monitoring. The study results showed that the proportion of graduation was 21.7 percent (Cl 15.8-28.7) 48.8 percent (Cl 41.1-56.6) and 80.5 percent (Cl 73.4-86.4) at 30, 60 and 90 days of supplementation respectively. There were no significant differences of mean weight gain between 60 and 90 days of supplementation. There was limited impact or weight gain once graduation was achieved. The findings of the study suggested that food supplementation even for as short as 30 days could be beneficial in some children with poor nutritional status, and proportion of graduation increase with time considering the effect on weight gain it is recommended to consider 60 days supplementation as optimum duration for growth faltered under 2 children in Bangladesh.

228 Walder CLF; Baqui AH; Ahmed S; Zaman K; Arifeen SE; Begum N; Yunus M. Low dose weekly supplementation of iron and/or zinc does not affect growth among Bangladeshi infants. *European Journal of Clinical Nutrition*. 2009; 63: 87-92.

The study objective was to determine the effect of low-dose weekly supplementation with iron, zinc or both on growth of infants from 6 to 12 months of age. The study was conducted as a randomized, controlled trial in the rural Matlab field research area of the ICDDR, B. A total of 645 breastfeed infants age 6 months who were not severely anemic (Hb 90gl) or severely malnourished(weight-for-age >60% median) were randomized to receive 20 mg iron and 1 mg riboflavin; 20 mg zinc and 1 mg riboflavin; 20 mg iron, 20 mg zinc and 1 mg riboflavin; or riboflavin alone (control) control weekly for 6 months. The study findings showed that baseline characteristics were similar among the four supplementation groups. Weight, length and mid-upper arm circumference were assessed at baseline, 8, 10 and 12 months of age. There was no interaction of iron and zinc when given in a combined supplement on either weight or length ($p>0.05$). There were no effects of either iron or zinc on the rate of length or weight gain for all infants or when stratified by baseline Hb concentration. Weekly supplementation of 20 mg Fe, 20 mg Zn, or both does not benefit growth among infants 6-12 months of age in rural Bangladesh, a region with high rates of anemia and zinc deficiency. So, additional research is needed to evaluate the risk of potential interaction between iron and zinc when given together in a high dose supplement and to evaluate the benefit of combined supplementation on functional indicators such as morbidity and growth.

2.12 HIV/AIDS/STDs

229 Aboud F; Huq NL; Larson CP; Ottisova L. An Assessment of community readiness for HIV/AIDS preventive interventions in rural Bangladesh. *Social Science and Medicine*. 2010; 70: 360-367.

This research work was intended to form the foundation for more effective community a public health partnerships and, in the end, more effective HIV/AIDS prevention efforts. The community–readiness stages model was adopted as a framework for assessing the level of preparedness of community leaders to facilitate planned HIV prevention efforts. Six focus group discussions with three professional groups (teachers, businessmen, drug shop vendors) in Hobiganj district were conducted in late 2005, and a single multi-professional group made up of teachers, imams, and drug shop vendors was convened in early 2007 to assess changes. The audio recordings in Bangla were coded as were English translations. The study findings revealed that everyone has heard of AIDS and regarded it as a potential catastrophe for the health, economy and social fabric of Bangladesh. Remarks concerning stage 1- Vulnerability indicated that most did not believe their community to be at risk, though Bangladesh was. Remarks at stage 2-knowledge to transmission were mostly vague but accurately identified sex, blood and needles as the main means of spread; however sex with sex workers was also mentioned in each group. Remarks at stage 3- prevention showed strong opposition to condoms for unmarried males and a preference for current means of forbidding sex outside of marriage. A few in each group recognized the importance of condoms for wayward youth. Stage 4- planning discussions centered on raising awareness and fear, and a desire for government and media to take the lead. By 2007 participants articulated more realistic strategies that they themselves could, and had, implemented, but also raised barriers that authorities should help them overcome. The findings provide formative information on the constraints and opportunities of community groups as partners in HIV preventive interventions and strategies to help them move to a higher stage of readiness.

230 Alam N; Streafield PK; Khan SI; Momtaz D; Kristensen S; Vermund SH. Factors associated with partner referral among patients with sexually transmitted infections in Bangladesh. *Social Science & Medicine,* 2010; 71:1921-1926.

The study aimed to understand the relationship of partners' referral intention with their actual referral behavior among patients diagnosed with STIs in Dhaka, Bangladesh. The study was nested within a randomized trial that investigated the role of single session counseling on partner referral outcome. A survey questionnaire was developed to collect data on demographic characteristics, sexual behaviors, and psychosocial information related to partner referral from the STI clients recruited in the study. Primary partners were defined as spousal/steady partner, and non-primary partners as non-spousal/non-steady partners with when whom the index clients had sexual relationships within the past three months. The study was conducted between March 2007 and December 2007 in three government and three NGO operated clinics in Dhaka and Chittagong city in Bangladesh. Partner referral cards when partners appeared at the clines within one moths of interviewing the STI clients. The finding showed that of the 1339 clients interviewed, 81% accepted partner referral cards but only 32% actually referred their partners; 37% of this referral were done by clients randomly assigned to a single counseling session VS. 27% by clients not assigned to a counseling session ($P<0.0001$). Among psychosocial factors, partner referral intention way best predicted by attitudes and perceived social norms of the STI clients. Actual partner referral was significantly associated with intention to refer partner and

attitudes of the index clients. Married clients were significantly more likely to refer their partners, and clients with low income were less likely to refer partners. Intervention programmers must address psycho social and socio-economic issues to improve partner referral for STI in Bangladesh. Therefore, it could be told that if stronger STI management programs with adequate partner referral initiatives could be helpful in preventing HIV spreads in Bangladesh.

231 Anonymous. Building and strengthening the technical and institutional capacities of government, NGOs and implementing partners: a monitoring survey report. Dhaka: National AIDS/STD Program & Population Council, 2009.

The study was carried out to monitor the activities under the package 913 at field level to assess the progress, identify gaps and challenges that can be addressed in designing Phase II activities. A cross sectional study was adopted among all relevant stakeholders related to activities of five assignments under package 913. A semi structured questionnaire was developed, field tested, finalized and used to collect data through one to one interviews. For improving coordination of HIV/AIDS related activities among implementing partners and government at district level, a situation analysis was conducted at district level for developing TOR for district level HIV and AIDS coordination mechanism. A total of 160 MTs of 80 NGOs were trained for fulfilling the gaps of skilled human resources at field level. Monitoring survey findings revealed that majority of MTs reported that materials used in MT training were good, they were benefited from field visits carried out at different organization working with most-at-risk populations and PLHA, and almost all of the trained MTs were benefited from practice session designed in MT training and enhancing their learning. Based on the findings of monitoring survey the recommendations are: the MT training needed to be redesigned: duration of training should be increased from 5 working days to 7-10 working days; training should be residential and friendly; more field visits, group exercise, and in-country exposure visit for MTs should be included. The duration of training mentioned in training manuals on peer educator, counseling, and caregivers should be extended. District AIDS Committee (DAC) need to be made functional for effective coordination of HIV/AIDS related activities at district level for ensuring maximum coverage, reducing duplication of efforts through unique, standard and quality HIV/AIDS programs.

232 Anonymous. Needs assessment study for developing the standard operating procedures for services to people living with HIV and AIDS. Dhaka: DGHS, National AID/STD Program, Save the Children, USA & Population Council, 2008.

This assessment was initiated to find out about existing services for people living with HIV and AIDS (PLHA), accessibility to these services, the dynamics of different programs targeted at PLHA, and the need for standardized operational tools for organizations working with PLHA. The needs assessment was carried out using qualitative methods. Data was collected by reviewing and activities of organizations working with PLHA, and conducting focused discussions and in-depth interviews. In addition, all relevant existing documents and literatures from international, regional and national level with regard to the provision of services PLHA were reviewed. The discussion was organized mainly on four themes, which were socioeconomic support; prevention, treatment and nursing care; psychological support; and legal and human rights support. A total of about 150 sources were reviewed and information and modalities were collected along with renowned sources materials from different PLHA related NGOs and selp-help groups of PLHA were reviewed. The study was found that counseling services are an integral part of almost all intervention of the organizations working with PLHA. But both the quality and the quantity of counseling services are not satisfactory. Training, standardized guidelines and monitoring of

counseling are inadequate. Although selp-help groups impart training and counseling to PLHA on a regular basis, they themselves lack comprehensive operational procedures to address training, health education issues, stress management, psychological support, family planning and counseling on prevention of parent-to-child transmission. The knowledge is there that empowerment of PLHA is important with regard to enhancing HIV/AIDS prevention programs no systematic procedure is followed to empower these people. With regard to common needs of PLHA, organizations working with PLHA cited the need of jobs and nutritional support for PLHA, irrespective of whether they are male and female. They also mentioned the following common needs: vocational training and job opportunity, treatment of common diseases and counseling, provision for ART and OI management, provision of child support, and expanded HIV and AIDS services at GOB hospitals with a good quality. The needs assessment suggests that SOP are needed organizations working with PLHA shared that they have no uniform operational guideline on how to provide comprehensive and quality services to PLHA. The strategic framework of SOP also should be shared in a national level workshop in order to get a broad based consensus expert on the framework.

233 Anonymous. STI knowledge and practices of unlicensed private practitioners in Bangladesh. Dhaka: National AIDS/STD Program, save the children USA & ICDDR, B, 2009.

This study was conducted to design and test an intervention to improve the STI counseling practices of non-formal private practitioners. This initial assessment was designed to provide up to date information about the STI services and HIV knowledge of private practitioners in a range of settings throughout Bangladesh. For the survey, structured interviews were conducted with almost 200 formal and nor formal providers in eight sites through out Bangladesh. A sub-sampole of the 40 providers who most commonly provide STI services was observed. In the survey, among the 187 providers surveyed (100 non-formal and 87 formal) over 74% reported seeing male STI clients and over 46% female STI clients. Overall, one third of providers did not examine STI patients at all and among those who did, half only observed the affected part. This survey identified a number of gaps in the STI knowledge and services of private providers, both formal and non-formal. It highlights areas where training might be targeted to improve practices. In particular many providers could benefit from accurate information on non-sexual transmission of HIV/AIDS and on the ineffectiveness of some methods of prevention, like use of lubricants with condoms. Continued and innovative methods are needed to reach these private sector providers and help them to improve the quality of their services so that the needs of their patients are met.

234 Anonymous. Improving STI services of non-formal providers through academic detailing by medical representatives. Dhaka: National AIDS/STD Program, Save the Children USA & ICDDR, B, 2009.

The aim of the feasibility assessment was to determine obstacles to dissemination of STI guidelines, examine their dissemination and use, and explores the acceptability of the guidelines and to assess providers' experience in serving youth. Then the aim of the pilot study was to determine whether and how medical representatives are disseminating the guidelines and to determine the impact of guidelines dissemination n provider practices. The planned intervention for equipping NFP with the necessary knowledge about STIs was to train medical representatives (MRS) from two selected pharmaceutical companies to disseminate a newly developed STI counseling guideline to NFP using academic detailing. For this, all medical representatives were trained in a day long orientation workshop. For pilot testing the guidelines dissemination,

observations of the interaction of MRs with NFP, and interviews with mystery clients (MC) were conducted. Findings of the participated in the training later disseminated the STI guideline to NFP, Usually using several visits to do so. MRs prioritized some messages and the two messages mostly explained to providers were; "encourage condom uses for sexually active youth" and "treated youth with respectful manner. At the interview, almost all NFP were able to explain four messages in the guidelines on the importance of counseling for STI treatment, encouraging youth to use condoms, provide respectful services to youth and refer youth to youth friendly health services. Findings on the pilot test showed that all MRs talked to NFPs about the need to encourage youth to use condoms. The pilot test showed a potential for impact on this hard to reach group of non-formal service providers and is promising as mystery clients received better services than those in the control area in terms of provider attitudes and counseling. The workforce and strength of private pharmaceutical companies should be utilized for public sectors health programs. The ability of MRs to disseminate health Information to health providers should be used as a potential resource.

235 Anonymous. HIV sharing the strategic framework of standard operating procedures for services to people living with HIV and ADIS: a national workshop report. Dhaka: National AIDS/SRD Program, Save the Children-USA, JPGSPH BRAC University and Population Council, 2008.

The objectives of the workshops were to get a broad-based consensus from national and international experts and policy makers on the standards for envies to PLHA and ensure their compliance, and to identify the issues that needed to be included or excluded in the strategic framework of the SOP, considering the overall situation of HIV prevalence in Bangladesh. It was a half day workshop divided into three sessions: program review, Presentation and open discussion, and concluded remarks by the special guests. A total of 54 participants attended the workshop. Participants from all levels such us from the MOHFW, NASP, UN agencies, international organization, development partners, civil society members etc. were present at the workshop. The participation of national and international experts has made this workshop very fruitful. The participants acknowledged the necessity of SOP for organizations working with PLHA and accepted the strategic framework of the SOP. There is a need to include treatment and care of PLHA in mainstream health services. Anonymous centers need to be established at government hospitals for ensuring one stop services to PLHA in public hospitals without stigma and discrimination. Religious issues play an important role in preventing the spread of HIV in Bangladesh as people follow religious practices, which have a protective effect.

236 Ara G; Melse-Boonstra A; Roy SK; Alam N; Ahmed S; Khatun UHF; Ahmed T. Sub clinical iodine deficiency still prevalent in Bangladeshi adolescent girls and pregnant women. *Asian Journal of Clinical Nutrition*. 2009; 1-12.

The aim of this study was to determine the iodine status of adolescent girls and pregnant women, to assess knowledge and practice an iodized salt use and to determine predictors of iodine status. A total number of 354 adolescent girls and 256 pregnant women were randomly selected from six divisions of Bangladesh. Socio-demographic information and iodine nutrition knowledge, weight and height were collected. Salt samples were collected from the households and spot urine samples were collected from the respondents. The median urinary iodine concentration of adolescent girls and pregnant women were 135 and 133 µg L-1, respectively. Among adolescent girls, 37% had UIC<100µg L -1 and among pregnant women, 56% had UIC<150 µg L -1. A significant correlation existed between the iodine concentration of the salt sample and UIC in both

adolescent girls and pregnant women. Half of the households of both adolescent girls and pregnant women used in-adequately iodized salt (<15 mg kg-1). Adolescent girls had better knowledge on cause and prevention of goiter than pregnant women. The odds ration of adolescent girls and pregnant women to be iodine deficient were 0.44 (95% Cl, 039 to 0.95) and 0.55 (95% Cl, 0.43 to 0.98) when they used adequately iodized salt. The results showed that sub-clinical iodine deficiency is still present in Bangladesh, specially the divisions of Dhaka and Rajshahi. Salt iodization, use of packed salt and nutrition education should consistently be stimulated, monitored and improved in order to establish adequate access to dietary iodine for all people in Bangladesh. So, UNICEF, BSCIC, BSTI and the Salt Mill Owners Association should be alerted about the magnitude of the problem so that curative measures can be taken and ensured.

237 Azim T; Khan SI; Hassen F; Huq NL; Henning L; Pervez MM; Chowdhaury ME; Sarafian I. HIV and AIDS in Bangladesh. *J Health Popul Nutr*. 2008 Sept; 26(3):311-324.

This paper reviews the existing situation of HIV in the country focusing on two main areas: state of the epidemic and issues around care and support. Along with prevention activities, gathering of data has been a key activity fostered by both the Government and individual development partners. This paper also reviewed available sources of data, including routine surveillance (HIV and behavioral among most at-risk populations), general population surveys and various research studies with the aim to understand the dynamics of the HIV epidemic in Bangladesh. Available data showed that the HIV epidemic is still at relatively low levels and is concentrated mainly among injecting drug users IDUs) in Dhaka city. In addition, when the passively-reported cases were analyzed, another population group that appears to be especially vulnerable is migrant workers who leave their families and travel abroad for work. However, all sources of data confirm that risk behaviors that make individuals vulnerable to HIV are high-this is apparent within most at-risk populations and the general population (adult males and youth males and females). Based on the current activities and the sources of data, modeling exercises of the future of the HIV epidemic in Dhaka suggested that if interventions are not enhanced further, Bangladesh is likely to start with an IDU-driven epidemic, similar to other neighboring countries, which will then move to other population groups, including sex workers, males who have sex with males, clients of sex workers, and ultimately their families. This review reiterates the often repeated message that if Bangladesh wants to be an example of how to avert an HIV epidemic, it needs to act now using evidence-based programming.

238 Begum, F. Missing vulnerable group of HIV/AIDS in Bangladesh: how to address those groups? *Nirmul: Quarterly Journal of BAPS*. 2007 Dec; 35: 7-14.

The objective of the study was to analyze the issues of HIV/AIDS in Bangladesh and to identify the groups those are responsible for HIV/AIDS infection. As total 150 millions of Bangladeshi is under serious thread of HIV epidemic because of too many vulnerable factors related to social, economic and geographical conditions of the country. The risk factors are related to high prevalence of HIV in the neighboring countries, increased population movement both internal and external due to open boarder, lack of awareness of HIV infection, existence of commercial sex and MSM with multiple clients, high prevalence of STIs amongst the commercial sex workers, their clients Hijra and injecting during users and men having sex with men (MSMs) are widely engaged in unsafe sexual behavior; migration and trafficking; poverty gaps; low nutritional status; gender inequalities that place women and young girls at risk and gaps in the healthcare delivery system. In Bangladesh, a cumulative total of 874 cases of HIV/AIDS have been confirmed and reported as of 1st December 2006. Since the first detection of HIV in Bangladesh in 1989, the rate

of infection has not been increased in comparison to our neighbors. A total of 240 AIDS cases were detected so far of which 109 have already died. However, the estimate of HIV/AIDS remains at 7,500 as of 2004. With all above known vulnerable factors, in reality still there are un-identified factors exists like external migrant workers, Beauty Parlier workers, construction workers and universities students, trackers, internal seasonal migrant workers and private clinic/laboratories are the important vulnerable groups, that need attention for HIV/AIDS education and counseling, but still these group remain unattended. Mobility and migration are not in themselves risk factors for HIV. However, lack of protection of health rights and vulnerable work conditions in the receiving states and lack of awareness in both the sending and receiving ends do make migrants vulnerable to this disease. To address all the above mentioned challenges, the Government of Bangladesh established a National AIDS commission in 1995, responsible for policy direction and the promotion of a multi-sect oral response. A draft National HIV/AIDS Policy was approved in 1997, and revised Draft National Strategic Plan for 1997-2002 was approved in 2000. The government is finalizing an Operational Plan that summarizes proposed actions and multilateral and bilateral agencies for 2002-2006 means 2nd National Strategic Plan for HIV/AIDS for 2004-2010 developed and approved. So, Bangladesh we have to develop a comprehensive list of all high risk groups by national survey to develop comprehensive strategy to identify all pockets and need base program interventions. Moreover, for this strategy to succeed a number of elements must be in place.

239 Bhuiya I; Chowdhury AH; Rahman M. Improving access to life skills based sexual and reproductive health education and condom services for male youth. Dhaka DGHS, National AID/STD Program, Save the Children, USA & Population Council, 2007.

The objective of this study was to assess the feasibility of improving access to SRH information and condom services for averting STIs including HIV among male youth. The study used a quasi-experimental design with two intervention strategies. Strategy I, denoted as experiment 1, received LSE on SRH along with condom service while strategy II, denoted as experiment II, received only LSE on SRH. The control group received none of the interventions. Three upazillas were selected purposively from Dhaka district. These three upazills were randomly assigned as experiment I, experiment II, and control. Focus group discussions were conducted among the gatekeepers and youth in experimental clubs. The study found that use of condom during sex as a safe sex practice was mentioned by 87 percent of youth during post intervention survey compared to 54% in the pre intervention in experimental sites ($p<0.001$). No change was found in control site, as the knowledge level about safe sex was as high as 72 percent at pre-survey. They lack of proper knowledge about their own or their partners' sexuality, communicate very little about sex in their relationships, and believe in numerous sexual myths. Some of the people are involved in high-risk behavior including practicing unsafe sex, and suffer from STIs. Thus, there is an urgent need for ensuring youth access to life skills education (LSE) on assess the feasibility of improving access to LSE on SRH and condom services among the male members of youth club aged 15-24 years in collaboration with Department of Youth Development (DYD), Ministry of Youth and Sports (MOYS). Knowledge of the dual benefits of condom use was varied from 1 percent to 11 percent during pre-survey across sites with more knowledge in control site (11 percent). Regarding knowledge of at least three potential health risks of teen pregnancy, no youth had such knowledge in pre-survey across sites. Intervention also resulted in significant ($p<0.001$) positive attitudinal change among the youth of experimental sites regarding use of condom by unmarried sexually active youth for safer sex practices than control site. Although the sample size in quite small but an increasing trend of condom use among youth was observed over time in experimental site. The recommendations based on the study findings are: the youth should be trained effectively

to impart LSE on SRH to their peers, since skills and efficiencies of information providers are vital for the success of the program. LSE needs to be focused on improving the comprehensive knowledge on SRH issues among youth and to strengthen their skills on safe sex decision making.

240 Bhuiya I; Rob U; Zahiduzzaman KM; Chowdhury AH; Sarma H; Rahman KM. Creating conditions for scaling up access to life skills based sexual and reproductive health education and condom service: strengthening safe sex decision making. Dhaka: National AIDS/STD Program, Save the Children USA, ICDDR, B and Population Council, 2009.

The overall objective of the project was to create conditions for scaling up the intervention model for improving access of male youth to HIV/AIDS focused LSE and services including condoms through youth clubs, so that they are able to safely manage their sexual and reproductive health. The scale-up study included a preparation phase, a model to scale-up and an evaluation phase. In the evaluation phase service statistics of youth clubs were collected and analyzed, and a survey was carried out among 1200 randomly selected youth to assess their SRH knowledge, attitudes, behaviors including condom use, and life skills. In addition, 260 in-depth interviews were converted among 120 youth to explore safe sex decision making skills, for avoiding drugs. The study results showed that the mean age of youth respondents in survey varied between 18.2 and 20, with a mean years of schooling of 9.4; 96 percent of youth were unmarried. Over 95 percent of youth received BCC materials and 99 percent reported that they had seen the posters on the dual role of condoms. Comparing the results of the scale-up study with the OR study showed a significant improvement in comprehensive knowledge regarding the purpose of condom use, its effectiveness, correct use of condoms, HIV/AIDS, and STIs. Youth clubs seem to be the appropriate place for educating youth on SRH issues and for providing condom services. Easy access to condoms during the intervention phase seems to have played a significant role in increasing safer sex behavior and safer sex practices during last sex. The cost analysis suggested that if the DYD of the MOYS would mainstream the LSE program at the national level, the unit cost for planning, training and supervision could be substantially reduced. The study reconfirmed the positive findings of the OR study and demonstrated that scaling up of the model at the national level would be feasible, effective and cost-effective. Scaling up the intervention has the potential to impact on millions of young people lives with regard to STI/HIV infection. Further research need to be done to assess utilization of services by youth, quality of services rendered to youth and costs required for providing such services, including medicines.

241 Chowdhury S. Reproductive tract infections and sexually transmitted infections of women in Bangladesh: a literature review. Dhaka: BRAC University, James P Grant School of Public Health, 2007. (Monograph series; no.3)

The study was initiated to review on what is known about reproductive tract infections and sexually transmitted infection (RTIs/STIs) in Bangladesh from published studies RTIs/STIs can have negative consequences on the health, social lie and economic situation of women. Although it has also negative consequences on health include not just physical discomfort but also infertility ectopic pregnancy, cervical caner, fetal wastage, low birth weight, infant blindness neonatal pneumonia and mental retardation. This paper compiled findings from 6 qualitative studies and 12 quantitative cross- sectional studies on sex workers, rural women and health providers. It looks at five issues, First it looks at the occurrence of RTIs/STIs among different populations pregnant women, sex workers, rural women, women visiting an urban health care clinic, and views of health providers with RTI/STIs infected patients, Secondly, the qualitative studies found that women did not view RTIs as purely a bio-medical problem, but blamed it on the larger stresses in

their lives, social economic and financial. Third, it discusses some o the factors that are causing RTIs/STIs among Bangladeshi women. Literature show these factors include side effects of contraceptives, low condom use and poor negotiation skills, lack of partner communication and partner management, menstrual hygiene and high risk behavior. Fourth case, the review found that treatment was sought mostly from female relatives and friends, healers, homoeopaths, pharmacists and the least from allopathic doctors as it is culturally prohibited for women to be seen let alone be physically examined, by any male other than her husband, Fifth it discusses how RTIs and STIs are managed through programmatic forms and diagnosis. A study a diagnosis of STIs found that the speculum-based algorithm might be a cheap and effective diagnostic and management tool, syndromes diagnosis and management of cervical STIs is highly compromised due to lack of diagnostic tools and by the low specificity on absence of clinical sign.

242 Chowdhury SA, Brain storming session sexuality and rights. Dhaka: BRAC University, James P Grant School of Public Health, 2009. (Monograph series; no. 10)

The primary after of this session was to gather initial feedback on the concept proposal of the research to beheld on sexuality and rights in Bangladesh and to get additional suggestions before launching the research activities. It will also gain perspectives from potential beneficiaries of the research so that gaps can be identified and the research design can be enriched further. The present research will gather data using qualitative research methods across different setting taking different cohorts that represent poor and middle class women, marginalized groups (garment workers), women working as activists academics, students etc, and different sexualities (minority community). Focus group discussion and in-depth interviews will be used as tools with structure/semi-structured question to gather life stories and case studies from the research participants. The key issues discussed at the brainstorming session, from the discussion it found that it is very difficult to move activities from reproductive health to sexual health, and the concept of sexual health was still less understood by the community. The whole point of research was really to understand what a sexual right is or how it could define 'sexual rights'. One of the speaker mentioned that one's sexual identity here might not be as encompassing as it is in the west. The research would look into gendered identities or not address these at all. Research would be able to find what was dominant and what was excluded. The concept of sexuality differs among persons, on the basis of their status. Those who are living in the streets, their perceptions of sexuality will differ as a consequence. From the discussion in the workshop, it came out that reproductive health problems, problems around dowry and around violence could be mitigating if would study sexuality as a whole. In the concluding remarks, the study indicated that the research teem appreciated the extremely valuable and useful feedback on the proposed research and the initial finding of the research would be shored with this group of participants.

243 Jashim-Uddin, M. Knowledge and perception of rural adolescent girls of Bangladesh on STDs and HIV/AIDS. *South Asian Anthropologist*.2008; 8(2): 111-116.

The present study was initialed to assess the knowledge and perceptions of rural adolescent girls on STDs and HIV/AIDS in Bangladesh. Data for this study came from a larger; community based cross-sectional and descriptive study with combination of both qualitative and quantitative data collection techniques during 2005-2006. The study was carried out in two sub districts in the southwestern and southeastern part of the country. The sub districts were selected from high and low performing areas of Bangladesh in terms of health and family planning indicators. The study populations were adolescent girls aged 10-19 years. Multivariate to logistic regression analysis was performed to evaluate the net association among socio- demographic, programmatic and

dichotomous outcome variables designed to measure STDs and HIV/AIDS knowledge of adolescent girls. Findings of the study revealed that only 20% of girls ever heard about STDs. No knowledge of STDs was significantly lower among girls of 13-19 years age group than those of 10-12 years. Only one third of the girls had correct knowledge about routs of transmission of STDs. Forty percent of the girls ever hard about HIV/AIDS. Education of the girls and their mothers has negative association on no knowledge on HIV/AIDS. The study also find that overall, 52% of mothers of the girls had no education. The mean year of schooling of mothers was 2.4. Majority of the girls had exposure to any type of mass media such as reading newspapers, watching television (TV) listening to radio and going to cinema. No knowledge on STD was found significantly lower among girls of 13-15 and 16-19 years age group than those of 10-12 years age group. Adolescent girls in high performing areas were significantly less likely to have no knowledge on STDs than the girls who were residing in low performing areas. So, findings of the study suggested that the adolescent girls in rural Bangladesh are not sufficiently more of STDs and HOV/AIDS and efforts on creation of awareness and motivational activities are very important for improving their knowledge.

244 Khosla N. HIV/AIDS interventions in Bangladesh: what can application of a social exclusion framework tell us? *J Health Popul Nutr*. 2009 Aug; 27(4): 587-597.

This paper employs a social exclusion framework to analyze the existing peer reviewed and grey literature on HIV and AIDS in Bangladesh. Here the constraints and opportunities in tackling social exclusion in Bangladesh were examined to identify social, economic and legal forces that heighten the vulnerability of such excluded groups to HIV/AIDS. It found that poverty and bias against women are major exclusionary factors. The paper presents areas for research and for policy action so that the social exclusion of high-risk groups can be reduced, their rights protected, and an HIV epidemic averted. This suggests that an HIV/AIDS epidemic could be imminent in Bangladesh. Although biomedical and behavioral change projects are important, they do not address the root causes of observed risky behaviors among high-risk groups. In Bangladesh, these groups include sex workers, IUDs, males who have sex with males, and the transgender population-hijra-who are all excluded groups. It is imperative now to use the opportunities provided by the current low prevalence of HIV in Bangladesh and the existing prevention programs. Unless serious measures are undertaken to address the risk faced by socially-excluded groups, the infection is likely to spiral. A social exclusion analysis can give a new impetus to prevention efforts by highlighting the multiple disadvantages faced by high-risk groups and to enable socially-just health programs.

245 Mahmood SAI. AIDS accountability gap among Governments: when will we keep the promise?. *Nirmul: Quarterly Journal of BAPS*. 2007 Dec; 35: 15-20.

The overall objective of this study was to find how to overcome the AIDS and the promise of Government of Bangladesh. This study was done through documental analysis on global and regional prevalence of HIV/AIDS and analysis of existing situation in Bangladesh. Almost all the determinants for an explosive outbreak of an HIV/AIDS epidemic have found to exist in our country. Curses of poverty, illiteracy, ignorance, proximity, malnutrition, unemployment, slum housing, family fragility, physical and sexual abuse & high prevalence of STIs made our country seriously vulnerable. In addition increased number of migrant workers, unsafe practice in health service, unsafe sex practice, lack of awareness on HIV infection, increasing number of homosexuality, low popularity of condoms & lack of voluntary blood donors & dependence on professional blood sellers had further increased. According to an official study in 2006, total HIV

carriers were 874. The government should encourage education on safe sex, violence, HIV/AIDS at all levels, including counseling & advocacy, marriage at appropriate age, and implementing the goals of Poverty Reduction Strategy Program (PRSP). As preventive measures, uses of condom, sterilized equipment's, disposal blades in surgery, dental surgery, barber shops, ensuring safe blood transfusion, obeying religious rituals, using mass media materials are important for prevention of HIV/AIDS epidemics. Government and NGOs should also construct low cost housing facilities in all major cities of our country so that married couple could live together.

246 Nahar L. Knowledge on HIV/AIDS among female floating sex workers in Dhaka City. Dhaka: NIPSOM, 2009.

The study was conducted to find out the knowledge about HIV/AIDS among the female floating sex workers in the selected areas of Dhaka city. Their socio-economic and demographic profile, knowledge about sexual health and health seeking behavior of female floating sex workers (FSW) were studied. Ninety female sex workers were selected purposively as study population. An interview schedule with semi-structured questionnaire was used for data collection. The findings of the study revealed that majority 23 (25.6%) were <18 years old, 88 (97.87%) of the respondents were Muslims, 35 (38.9%) were interviewed from Kamlapur Railway Station. Majority 30 (33.3%) had income at or below taka five thousand. Majority 29 (32.2%) were working for one or less year, their mean duration is 1.63 years, 25 (80.6%) said clients do not like, 4 (12.9%) use other method of contraception. Distribution of respondents by using of condoms in last sexual intercourse showed that 78 (86.7%) used and 12 (13.3%) did not use. Distribution of respondents according to their opinions about dissemination of AIDS related information showed that 64 (71.1%) think that it should be 17 (18.9%) said not needed. Among the 45 (76.3%) knows condom as preventive measure and advocates its use. About 17 (54.87%) had knowledge but do not advocate its use in each intercourse. Among them, no one scored excellent, 2 (2.2%) scored good knowledge, majority 51 (56.7%) had average knowledge and 37 (41.1%) had poor knowledge. Awareness on STDs/HIV/AIDS should be received urgent attention so that they consider compulsory to use condom during entertainment.

247 Shahjahan M; Kabir R; Islam KS; Rashid HA. Knowledge of men about sexually transmitted diseases and HIV/AIDS and factors affecting them. *South Asian Journal of Population and Health.* 2009 July; 2(2): 159-166.

The study aim was to assess and gain an understanding of the high risk sexual behaviors of men, their knowledge on AIDS and modes of its transmission. It is a descriptive cross—sectional study. A total of 615 married men were interviewed for this purpose. Data were collected through an interview schedule in six different NGO managed working areas. The study was conducted in Dhaka (Agargaon), Narayangonj, Narshingdi, Tangail, Narail and Gaibandha from January to June, 2007. Over eighty-nine percent of the men believed that spouses could be affected by STDs of their partners. Of the respondents, about 73 percent reported that men are more vulnerable to transmission; 95 percent of the men reported that multiple partners are the causes of more vulnerability, and 82 percent of the male respondents believed that the use of condoms could prevent STDs. Just over 76 percent of the men were knowledgeable about reproductive tract infection; 74.1 percent reported that the sources of reproductive tract infection prostitutes, 37 percent reported ignorance about the use of condom and 31 percent reported multiple sexual partners. Overall about 92 percent of the men had heard of AIDS, and most were fairly informed of transmission risks. Logistic regression analysis revealed that education and monthly income were the most important correlates of knowledge level of men on HIV/AIDS. Men with a primary

level education or less were significantly less likely to have knowledge on AIDS than those who had secondary and higher level of education. The reduction of risky sexual behavior of men is the key to reducing HIV transmission in Bangladesh and has the power to change the course of the AIDS epidemic.

248 Sultana M; Islam ST; Myeen-Uddin ASM. Pregnant women's awareness of HIV/AIDS transmission and prevention: a study on maternity and child health training institute. ***The Journal of Social Development.*** **2008; 20(1): 41-52.**.

The premier aim the study was to determine the level of HIV/AIDS awareness regarding transmission and prevention among pregnant women, since they are the most sensitive segment of the population and to explore level of knowledge regarding transmission routes of the HIV. Pregnant women came to make their first antenatal visit at MCHTI, Azimpur, Dhaka are the population of the study. The present research work is a combination of descriptive and exploratory study where some efforts are made for elucidating the level of HIV/AIDS transmission. Using purposive sampling method so pregnant women have been considered as sample. Interview schedule is used to collect required date. Then data have been analyzed using simple statistical measurement. In the present study pregnant women were asked regarding the means by which HIV/AIDS does not transmit. It is seen that 33.75% expressed their opinion that HIV/AIDS does not transmit by embracing or kissing. Among the other means by which HIV/AIDS does not transmit with living infected person (12.75%), feeding to gather (10%), using same dishes (3.75%) or sle4eping in same bed (2.50%). But the women could not give any response on using same toilet/bathroom, coughing and beating of mosquitoes, insects or other sources, which are not responsible for transmitting HIV/AIDS. As for any prevention of HIV/AIDS is concern it is observed that 27.50% know about the prevention of HIV/AIDS, where 23.75% know moderately. Besides, 22.50% know little about the HIV/AIDS prevention 26.25% pregnant women told, they do not know at all about the prevention of HIV/AIDS. The findings of the study indicate that to some extent pregnant women have the knowledge of HIV/AIDS, but the level of awareness is not satisfactory. So program for the awareness is not satisfactory. Therefore programs for the awareness of pregnant women are made urgently needed. In the family level parents and other guardians have to make aware their children in this regard. Finally, there is a need to make a national policy on HIV/AIDS.

Chapter - III
Indexes

3.1 Author Index:

3.2 Subject Index: