Appendix 4

Save the Children

Bangladesh MotherCare Project

Final Evaluation

Conducted as Part of the Bangladesh Child Survival 8 Midterm Evaluation

USAID Cooperative Agreement FAO-0500-A-00-2034

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Acknowledgments

This Final Evaluation could not have been conducted without the help of Save the Children's dedicated Bangladesh Field Office Directors (Tom and Lisa Krift) and field-based staff: Mr. Kolimullah Koli (NasirNagar Impact Area Manager); Mr. Dwijendra La1 Sutradhar (NasirNagar Child Survival Coordinator); Mrs. Rawshan Ara Begum (Kunda Community Development Coordinator); Mr. Md. Shafiullah (Gokama Community Development Coordinator); Mrs. Rasheda Begum (Kunda Community Health Organizer); Mrs. Raihana Sultana (Gokama Community Health Organizer); Mrs. Archana De Costa and Mrs. Jahan Ara Begum (Kunda Nurse Midwives); Mrs. Sylvia Karmakar (Gokama Nurse Midwife); all Family Health Promoters; and also Mrs. Beena and Mr. Altaf (managers of the Kunda guest house).

Data collected by the team would have remained unanalyzed without the expertise of the Bangladesh Field Office Management Information Systems staff for their many long hours of work, we are grateful to Mr. Md. Adnan Anwar (Data Manager) and Mr. A. Rakib (MIR Assistant); we also appreciate the assistance provided by consultants: Mr. Md. Badruddoza (Consultant Analyst); and Mr. Kazi Md. Abdullah and Mr. Mir Md. Shahiduzzaman (data entry clerks).

The guidance and criticism offered by Mr. Nikhil Chandra Roy (Research Fellow, ICDDR,B MCH-FP Extension Project) were greatly appreciated.

Save the Children's Bangladesh MotherCare Project received USAID funding through Bangladesh Field Project Agreement 1659-004 of subcontract DPE-5966-Z-00: 8083-Z from John Snow, Inc. with funding from April 1991 through June 1993. Under this subcontract, the project benefited from the support and advice of Dr. Marge Koblinsky and from technical assistance provided by medical and social marketing consultants Dr. Al Bartlett, Mr. Kim Winnard and Mr. Richard Pollard. Project activities were continued with partial support from USAID Child Survival 8, Cooperative Agreement FAO-0500-A-00-2034, beginning October 1, 1992.

This final evaluation of the MotherCare project was conducted as Part 1 of the Child Survival 8 Midterm Evaluation.

Final Evaluation Team members are convinced that the MotherCare Project has benefited the women and children of Nasimagar, and hope that lessons learned can be applied more widely in Bangladesh. We are pleased to have had the opportunity to serve on the team.

Abbreviations

BFO-Bangladesh Field Office (Save the Children/USA)

CDC-Community Development Coordinator (SC staff)

CHO--Community Health Organizer (SC staff)

CS-Child Survival

DIE--daughter-in-law (in K&P survey)

FET--Final Evaluation Team

FGD--Focus Group Discussion

FHP-Family Health Promoter (SC staff)

FWC--Family Welfare Center (GOB)

FWV--Family Welfare Visitor (GOB)

GOB-Government of Bangladesh

HIS--SC's Health Information System (manual & computerized)

IEC--Information/Education/Communication

K&P--Knowledge and Practice

MCH--Maternal and Child Health

M&-mother-in-law (in K&P survey)

MUAC--mid upper arm circumference

NMW--nurse midwife

PMIS--Program Management Information System (computerized)

PNC-prenatal care

SC-Save the Children (U.S.A.)

SES-socio-economic status

TBA-traditional birth attendant

TT--tetanus toxoid

USA-ID--United States Agency for International Development

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Bangladesh MotherCare Project Final Evaluation

Executive Summary

Background Information about the MotherCare Project

Save the Children's Bangladesh MotherCare Project aimed to reduce neonatal and perinatal mortality and maternal and neonatal morbidity through means which were sustainable and replicable. Mother&e Project interventions were developed during 1992 and implemented during 1993 in five villages of NasirNagar Thana (Brahmanbaria District), covering a total population of approximately 25,000; interventions which have proven successful will be replicated by Save the Children (USA) through its USAID-funded Child Survival 8 Project, which covers all unions in NasirNagar (a total population of approximately 160,000)..

The Bangladesh Field Office decided to implement MotherCare activities after observing that neonatal mortality rates remained fairly stable and continued to account for a high proportion of total infant mortality, despite the decrease in child mortality which followed implementation of Child Survival interventions. NasirNagar was selected as the site for project implementation because it is one of the poorest and most isolated regions in Bangladesh: landlessness is increasing; flooding persists for six months a year, making the maintenance of roads extremely difficult and costly; there is no electricity; and only 10% of women are literate.

The MotherCare Project has employed three strategies to improve maternal, perinatal and neonatal health: 1) an information/education/communication campaign directed toward pregnant women and influential family decision-makers (husbands and mothers-in-law); 2) training of TBAs and MCH clinic personnel to improve case management of simple complications during pregnancy, delivery and the post pax-turn period, as well as routine maternal and newborn health care; and 3) reduction of some obstacles which prevent pregnant and post partum women from following through on referrals for more advanced care for themselves or their newborns. Together, these strategies were intended to increase the practice of protective health care behaviors at the family level; to increase use of appropriate preventive and curative services; and to increase the quality of field-based preventive and curative health services for pregnant women and their children. While it was recognized that improvement of service capacity and quality at referral hospitals is essential to reduce maternal and neonatal mortality, direct improvement of such services was outside the scope of this project: findings from various phases of the MotherCare Project have been, and will continue to be, shared with government health policy makers, in an effort to increase the allocation of resources for training and posting of health personnel needed to deliver women's health services, and for improvement of hospital-based obstetric services.

Final Evaluation Activities

Final evaluation of the MotherCare Project occurred in March and April, 1994, and included the following activities:

I. review of data collected in Save the Children's census-based health information system to document birth and infant death rates which prevailed in the project area before and during the project interventions;

2. study of women's nutritional status through surveys of mid-upper arm circumference;

3. review of field-based health worker registers to determine levels of attendance at prenatal care sessions and 'TT immunization of pregnant women;

4. assessment of changes in knowledge and practice (including willingness to follow advice concerning referral) on the part of mothers, husbands and mothers-in-law through a) review of baseline and final K&P survey results; and b) focus group discussions; and

5. assessment of case management practices of TBAs and SC's nurse midwives and Community Health Organizers through a) review of postnatal questionnaire results and field-based management records; and b) focus group discussions with health care providers.

Lessons Learned

1. The Project resulted in significant increases in levels of knowledge and practice among pregnant women and influential family decision-makers.

Both K&P survey results and focus group discussions show clear and significant increases in levels of knowledge on the part of mothers, husbands and mothers-in-law. All groups are more aware and supportive of behavioral changes:

a. that can improve the health of women during pregnancy: e.g., attendance at PNC sessions, increased food consumption, intake of iron tablets, and increased rest; and

b. that can improve the health of mothers and newborns post partum: e.g., increased maternal fluid intake, avoiding food restrictions, intake of Fe, feeding colostrum, exclusive breastfeeding through the first four months after birth, and controlling fertility through modem contraception.

There was also a significant increase during the course of the project in mothers' perception of support from other family members (husbands, mothers-in-law) for protective health behaviors.

Perhaps more importantly, the K&P survey showed significant increases in certain protective practices:

a. intake of iron tablets during and after pregnancy;
b. increased food intake during pregnancy;
c. some improvement in breastfeeding practices (regarding feeding of colostrum and exclusive breastfeeding in the period immediately post partum);
d. increased attendance at PNC sessions (important in view of the finding that women who attended PNC were also more likely to receive TT during pregnancy and to take Fe);
e. increased use of trained TBAs and preparation of items needed for hygienic deliveries; and
f. increased willingness to seek treatment for complications in delivery.

2. The Project resulted in improvements in TBA management of normal deliveries and in referral of complications, and offered greater insight into obstacles to referral.

By the end of the project, significantly higher proportions of mothers reported that TBAs had used soap and plastic sheets during delivery and had boiled blades. Materials (such

as hot compresses, ash) were less likely to be placed on the umbilical cord; this is important, as placement of materials on the umbilical stump was significantly associated with neonatal health problems.

There was no association between delivery by a trained TBA and the incidence of maternal problems post par-turn. Infants who were delivered by trained TBAs, however, were significantly less likely to have health problems. Given the current debate over the impact of TBA training and use of safe birth kits, this association bears more careful investigation, with control for possible confounders.

Although the constellation of problems reported as occurring during pregnancy was somewhat different in the final survey than it was in the baseline, dizziness remained the leading problem; even in the final survey, however, women usually required prompting before reporting they had experienced any problems in pregnancy. Their failure to report problems spontaneously, along with their tendency not to regard problems as "serious", makes it difficult to assess levels of knowledge about potentially serious problems during pregnancy and/or willingness to seek treatment. Prolonged or delayed labor was the most common problem occurring during delivery, while "fever" accounted for the largest proportions of problems occurring in the post partum period. Symptoms of AR1 accounted for most problems of the newborn.

K&P surveys, postnatal questionnaires and focus group discussions indicated that for problems in pregnancy or delivery, women and their families would begin by seeking care from local providers (SC personnel, who were more likely to be consulted for problems in pregnancy, and village doctors, who were more likely to be consulted for problems in delivery and for problems concerning the newborn); only if these local providers were unavailable or unable to help would they go to the hospital. FGDs suggested that the TBA training program had improved the status of TBAs to the point where their advice on the need for advanced care was generally heeded. Even after TBAs advised referral, however, families would try to obtain help from NMWs or village doctors. Local government providers were consulted for only a small proportion of problems: focus groups expressed dissatisfaction with providers at some government service sites, usually because of the absence of such providers from their posts. It must be acknowledged, however, that throughout the course of this project, the Government of Bangladesh has been undertaking programs designed to improve both the quality and capacity of MCH services and to increase the number of government personnel who are actually posted in villages; NasirNagar is a particularly difficult area for recruitment.

The most common reason given by mothers for not seeking treatment for problems which occurred during pregnancy was their perception that the problem was not serious; even at the time of the final K&P survey, mothers required prompting--through the listing of possible symptoms--before they indicated that they had experienced problems in pregnancy. The next most common reason for not seeking care or not accepting advice for referral was lack of money. Financial constraints limit the extent to which mothers and families can turn to village doctors for help: even though village doctors claimed to treat the poorest members of the community on credit, mothers-in-law and husbands said that their care was prohibitively expensive. The current quality of care offered by village doctors is of concern: their administration of syntocin to women in labor is just one of many practices that may adversely affect the health of women and infants. Although some mothers cited religious or traditional convictions as barriers to obtaining care for themselves, proscriptions against leaving the home did not appear to be an important obstacle.

3. During the course of the MotherCare Project, improvements were seen in birth and infant death rates.

Between the start of 1990 and the end of 1993, data from Save the Children's health information system show that the birth rate dropped from 37 to 32; infant mortality from 116 to 100; and neonatal mortality from 54 to 53. The population covered by the Project is too small to allow any reliable calculation of maternal mortality. The extent to which changes in rates of vital events reflect project interventions is uncertain: no control area was studied, and normal annual fluctuations in birth and death rates may be responsible for some of the change.

A slightly higher proportion of neonatal deaths was attributed to tetanus in 1993 than in 1990: this may reflect the shortage of tetanus toxoid which occurred during the first few months of that year. As in the 1991 case study, the main cause of neonatal death in 1993 was ARI.

4. While a large proportion of women of reproductive age are malnourished, it seems possible to identify some groups of women who are especially vulnerable.

In the baseline survey, the mean MUAC for women aged 15 to 45 years was 22.2 cm; 8% of the population was severely malnourished and 32% moderately malnourished. In the final survey, mean MUAC was 22.6 cm; 5 % of the population was severely malnourished and 25% moderately malnourished. In both surveys, MUACS of poorer and younger (15 to 20 year old) women were significantly smaller than those of "more affluent" and older (26 to *35* year old) women.

Recommendations

1. In view of the tendency of women and their families to try to obtain care from local sources (even after referral to hospital), improved capacity for field-based case management is essential. As advocated by UNICEF and the Obstetrical and Gynaecological Society of Bangladesh, field-based care providers at all levels should be able manage obstetric emergencies appropriately and, to the extent possible, to stabilize patients until they or their families agree to referral.

The ability of SC's nurse midwives and CHOs to manage cases in the field was severely limited by the BFO's proscription against their use of injectable antibiotics or IV drugs or fluid replacement: even though nurse midwife case management protocols clearly require these capabilities, nurse midwives and CHOs were instructed to refer women and newborns requiring such treatment to hospital, or to government FWVs or even village doctors if hospital transfer was not immediately possible or was refused. SC BFO staff believed that if the agency were to offer such treatment, it would increase community reliance on a source of care that will not be sustained after the end of the CS8 project and might increase the agency's liability for any mishaps; because it is very difficult to attract highly experienced personnel to a post like NasirNagar, this last concern is not unfounded.

Given this pmlosophy, however, it is imperative that the agency improve the case management abilities of local government and non-government providers and strengthen logistics to ensure that government providers have access to adequate supplies. SC can establish channels for communication between village leaders and thana-level administrators: dialogue on family planning issues with thana-level administrators has already been initiated; such dialogue should be broadened to include issues related to emergency obstetric treatment and other aspects of reproductive health, and should invite participation from representatives of the Unicef-supported Emergency Obstetric Care Programme.

Care from village doctors cannot be accessed by the poorest members of the community. Nevertheless, training of village doctors should be undertaken in order to improve the quality of their practice: these providers will remain an important source of care for a large proportion of community residents long after the end of Save the Children's programs. The Agency might pilot some mechanisms to increase access of the poorest community residents to village doctors: for example, the provision of small stocks of free supplies to village doctors, with the stipulation that such supplies be reserved for the poorest families. With the cooperation of community **and** religious leaders, SC could train village doctors in the administration of injectable contraceptives.

2. The IEC strategy employed in the MotherCare Project achieved significant increases in community knowledge and practice, and should be replicated.

The approach taken in this project is noteworthy for targeting husbands and mothers-in-law, as well as pregnant women: mothers' perception of increased support from influential family decision makers may have been as important in increasing their practice of protective behaviors as their own increased level of knowledge.

Operations research projects could certainly be designed to compare the effectiveness of strategies focused on pregnant women alone to those focused on women and other family members. It seems more advisable, however, to simply accept the effectiveness of the strategy employed in this project and to devote additional resources to improving field-based case management and increasing the feasibility of referral and the availability of contraceptives.

3. In view of findings that malnutrition was greatest among poorer and adolescent women,

income generation opportunities for the poorest community residents remain essential; and

an IEC campaign, focused again on influential family members, should be designed to increase food intake by young and adolescent girls.

4. Given the frequent citing of financial barriers to acceptance of advice for referral, Save the Children should continue to try to develop mechanism5 to reduce those barriers.

The establishment of Emergency Referral Funds through Women's Savings Groups was not successful, in part because WSG members thought it was too risky to designate any part of their savings for this purpose; there appeared to be some confusion in the minds of Savings Group members about the concepts of insurance vs. loans for hospital care. Other strategies which Save the Children might employ--which could be replicated by other NGOs, but are not necessarily sustainable--include agency-subsidized transport of cases needing emergency care, perhaps through community endowments.

I. Introduction

A. Description and History of Project

Following is the Final Evaluation Report on Save the Children's Bangladesh MotherCare Project. The project has employed three strategies to reduce maternal, perinatal and neonatal mortality: 1) an information/education/ communication campaign directed toward pregnant women and influential family decision-makers (husbands and mothers-in-law); 2) training of TBAs and MCH clinic personnel to improve case management of complications during pregnancy, delivery and the post partum period, as well as routine maternal and newborn health care; and 3) reduction of some obstacles which prevent pregnant and post partum women from following through on referrals for more advanced care for themselves or their newborns. Together, these strategies are intended to increase the practice of protective health care behaviors at the family level; to increase use of appropriate preventive and curative services; and to increase the quality of field-based preventive and curative health services for pregnant women and their children.

While it was recognized that improvement of service capacity and quality at referral hospitals is also essential to reduce maternal and neonatal mortality, direct improvement of such services was outside the scope of this project: findings from various phases of the MotherCare Project have been, and will continue to be, shared with government health policy makers, in an effort to increase the allocation of resources for training and posting of health personnel needed to deliver women's health services, and hospital-based obstetric services.

The decision to implement MotherCare activities was made after Save the Children observed that neonatal mortality rates remained fairly stable and continued to account for a high proportion of total infant mortality, despite the decrease in child mortality which followed implementation of Child Survival interventions. A case study undertaken in September/October 1991 examined all neonatal deaths and stillbirths which had occurred during the previous two years (1989-90) to clarify cause of death, patterns of health service use and nutritional practices: results of this case study informed the design of MotherCare interventions.

The Bangladesh Field Office's MotherCare Project has been implemented in five villages of NasirNagar Thana (Brahmanbaria District), covering a total population of approximately 25,000. NasirNagar, a low lying area much of which remains under water for four to six months during the monsoon season, is located 90 km northeast of Dhaka: the region is one of the country's most poor, isolated and culturally conservative areas. Until the beginning of 1993, Save the Children maintained health centers in two villages in this region, Kunda and Gokama. Although the population in the project area could theoretically be served by four government maternal and child health facilities, those facilities have until recently been too poorly staffed and/or equipped to be of much practical help. The BFO is now in the process of implementing those educational activities and training programs which were developed during the course of this project in a much larger program area (covering a total population of 160,000).

Aside from the case study mentioned above, past research and evaluation activities which are relevant to this Final Evaluation are as follow:

1. study of the nutritional status of women of reproductive age: at the time of the case study, mid-upper arm circumference measurements were made on all women of reproductive age living in the project area.

2. baseline Knowledge and Practice surveys: these surveys were conducted from November 1992 to February 1993, before the implementation of IEC materials, and included all women who had delivered during the previous two months, their husbands and their mothers-in-law.

3. midterm evaluation (April, 1993): the "midterm" evaluation actually fell near the start of project implementation and was therefore focused on process rather than impact; two forms developed during this evaluation (the Postnatal Questionnaire and the Clinic Management Form) were used to assess case management.

B. Final Evaluation Activities

The Final Evaluation aimed to measure project impact on 1) knowledge and practice of protective health care behaviors (including willingness to obtain advanced care) among pregnant women and other family members; 2)perinatal and neonatal mortality; and 3) other aspects of maternal and neonatal health (e.g., nutrition, morbidity). Although some evaluation activities focused exclusively on one strategy or another, it is impossible to differentiate the contribution of each of the project strategies to overall change.

Final Evaluation activities occuned in March and April, 1994 and included the following:

1. Review of Computerized Health Information System Data and HIS procedures:

   a. Review of PMIS Demographic and Health Data for 1990 and 1993:
   Birth and infant death rates and cause and time of infant death are compared for two intervals: that preceding implementation of MotherCare activities (1990) and the period of project implementation (1993).

   b. Review of HIS procedures:
   The Final Evaluation Team also reviewed whether the BFO had followed through on suggestions made during the Midterm Evaluation on strengthening the HIS to make it a more effective tool for reaching and monitoring pregnant women and newborns.

2. Study of Women's Nutritional Status

The final evaluation repeated the mid-upper arm circumference survey for all women of reproductive age living in the project area; after stratification for pregnancy, socioeconomic status, age and marital status, results were compared to findings from the first survey. It should be noted, however, that IEC messages imparted during the MotherCare Project were focused on pregnant women--not all women of childbearing age. Moreover, the two surveys took place at different times in the year. Thus, the results should not used to assess the impact of project interventions; rather, they simply provide greater insight into a major risk factor for poor maternal and neonatal health.

3. Assessment of Changes in Knowledge and Practice, and Exploration of Reasons for Change

   a. Knowledge and Practice Surveys:
   The same questionnaires which were used in the baseline survey were administered to all women who delivered during the two months preceding this evaluation (January-February, 1993), and to their husbands and mothers-in-law. Results of baseline and final surveys are compared to assess changes in levels of knowledge and practice.

b. Focus Group Discussions:
Focus groups with mothers, husbands, mothers-in-law, health care providers and community leaders explored their perceptions about reasons for behavioral change, as well as their impressions of the IEC strategy.

4. Review of HIS and PNC Records to Determine Levels of Attendance at PNC Clinic and TT Immunization

a. PNC attendance:
The Final Evaluation Team reviewed the "fertile couples" and antenatal rosters of FHVs and CHOs to assess the level of participation in prenatal care: as in the Midterm Evaluation, this involved a systematic comparison between numbers of women listed as possibly pregnant by Family Health Volunteers (FHVs), women confirmed as pregnant by Community Health Organizers (CHOs), women with one PNC visit, and women with a second PNC visit.

b. Tetanus immunization:
TT coverage among women who are "confirmed pregnant" was assessed by examining the CHOs' pregnancy registries.

5. Evaluation of Case Management Interventions

a. Review of Postnatal Questionnaires, Nurse Midwife and CHO Records, and Clinic Management Forms:
Information from the postnatal questionnaires allowed us to determine whether TBA training included in this project was associated with improved TBA management of routine delivery. The Final Evaluation Team studied records maintained by NMWs and CHOs, in order to determine more accurately whether complications had been managed correctly.
Information from Postnatal Questionnaires also allowed the Final Evaluation Team to determine the proportions of women who followed advice on referral, and to study their reasons for not seeking or obtaining advanced care, if so referred.

b. Focus Group Discussions (FGDs):
Discussions with TBAs, CHOs and NMWs explored their perceptions of training materials and sessions; problems in diagnosis, management and referral; and obstacles to referral. FGDs were also conducted with village doctors to explore their perceptions of training needs and their receptivity to training. (The report on FGDs is included in the section on the K&P survey.)

II. Review of HIS Data and Procedures

A. PMIS Data on Demographic and Health Indices in Project Area

Data collected in Save the Children's community-based Health Information System allow the routine monitoring of mortality as well as the targeting of education and services toward pregnant women and their families. The MotherCare Project was implemented in five villages in Nasimagar: Kunda, Moslendapur, Gokarna, Chairkury and Nurpur.

Table I presents demographic data and rates of stillbirth and infant mortality for the project area one year before the project (January l-December 3 1, 1990) and during project interventions (January l-December 3 1,1993). Birth and mortality rates are compared to 1991 national rates (1993, UNICEF).

Table 1: Demographic Data for Project Area

	before project	during project	national
total population	26,091	25,436*	
women aged 15-45	4,832	5,224	
live births	973	810	
crude birth rate	37	32	39
infant deaths	113	81	
infant mortality rate	116	100	101
neonatal deaths	53	43	
neonatal mortality rate	54	53	
stillbirths (gest > 7 mo)	62	32	
stillbirths:livebirths	6:100	4:100	
perinatal deaths	87	57	
perinatal death rate	89	70	
maternal deaths**	3	3	

*PMIS reports mid year populations, in this case for 1990 and 1993; these figures do not include persons who may have temporarily migrated out.

**Systematic investigation of deaths occurring among women aged 10 to 45 years was instituted by BFO staff in 1993. Maternal deaths--i.e., deaths directly or indirectly related to pregnancy, occurring either during pregnancy or within 42 days post partum--were not so rigorously ascertained before 1993. Our denominator is too small to allow calculation of a valid maternal mortality rate.

Tables 2 and 3 compare neonatal deaths which occurred during the two periods according to rime and cause of death. Because causes of death listed in Table 3 are drawn from SC's routine HIS records, the distribution of causes may differ from that reported in the 1991 case study: cause of death assignment in the case study was through verbal autopsy. In this table, "birth related" refers to deaths occurring within two weeks of birth which could not be assigned any other cause: this category is likely to include premature or low birthweight infants who died without any other recorded complication.

Table 2: Time Distribution of Neonatal Deaths

time of neonatal death	baseline	1993
day I	17%	32%
days 2-6	38%	26%
days 7-28	45%	42%

Table 3: Neonatal Deaths by Cause of Death

cause	baseline	1993
ARI	19%	23%
thrush		7%
sepsis	2%	
fever	2%	
diarrhea		2%
tetanus	6%	9%
malnutrition	4%	5%
others	6%	5%
birth related	63%	49%

The slight increase in deaths from tetanus in 1993 may reflect the shortage of vaccine which occurred in the early months of that year. In both years, ARI follows "birth related" as the leading cause of neonatal death.

B. Review of HIS procedures

1. Reporting of Maternal Deaths

At the time of the 1991 Case Study and the April 1993 Midterm Evaluation, recommendations were made to BFO health staff for improving the recording of maternal deaths: in 1991, it was difficult to ascertain maternal deaths because the pregnancy status of the deceased person was not noted in the HIS. In 1993, the BFO took steps to significantly improve the detection of deaths related directly or indirectly to pregnancy: in their manual death records, FHPs are required to record symptoms associated with all deaths; two possible "symptoms" are pregnancy or death within 42 days of delivery. In addition, the BFO Senior Program Officer for Health has been verifying the cause of death for all women aged 10 to 49 years. Ascertainment of maternal deaths has improved to the point where the BFO's data base may **now be** one of the most reliable in Bangladesh: as the BFO's CS8 project covers a population of 160,000, it becomes more feasible to generate maternal mortality rates.

2, Identification of Primigravidas Not Regularly Residing in Project Area

Only those persons who have resided in the project area six months or more are enrolled and monitored in SC's HIS. This is a sensible approach to the longitudinal monitoring of a fairly stable population, but it may fail to identify a particularly high risk group: primigravidas who migrate from a site outside the project area back to their parent's home, just to deliver. While it would be inadvisable to include these women in the permanent population base, some mechanism should be developed whereby FHPs can systematically identify them, refer them to a trained TBA for delivery (or to prenatal care if they have arrived in the project area well before delivery), and record the outcome of their delivery.

3. Use of Home-held Maternal Health Cards

Maternal health cards are kept at the SC PNC clinic. The GOB distributes maternal TT cards, but distribution is sporadic; in its CS8 area, SC is complementing government distribution of TT cards.

It might be worthwhile to pilot more complete home-held cards in at least part of the CS8 project area: such cards would make it easier for a woman who migrates (whether or not she is pregnant) to inform local health care providers of her health history.

4. *Verification of Seasonality of Births and Infant Sex Ratios*

In comparing results from the baseline and final K&P surveys, we noted that the numbers of births reported during the two-month baseline period was considerably lower than that for the two-month final period. We examined the distribution of 1993 births by month for two villages (Kunda, Moslendapur), and found that the proportion of births occurring during the November through January quarter was higher than that for any other quarter: of a total 346 births, 35 % were born November through January; 23 % in February through April; 19% in May through July; and 23% in August through October.

In both the 1991 case study and the sample of postnatal questionnaires reviewed during the final evaluation, the number of female infants was somewhat less than would be expected based on the normal 51:49 male:female ratio. Although SC's community-based HIS makes it exceedingly unlikely that the births of females would be under-reported--a mother would need to conceal her pregnancy in order for a birth to escape detection--the FET sought to verify that the observed departure from the normal ratio was due only to the relatively small size of study populations. The FET examined 1993 birth registers in Kunda/Moslendapur and Gokarna/Chaikury to determine the sex ratio for births (live births+ stillbirths): out of the 346 births in Kunda/Moslendapur, 52% were male and 48% female; out of the 277 births in Gokarna/Chaikury, 49.5 % were male, 49.5 % female and 1% of unknown sex.

III. Women 's Nutritional Status: Mid-Upper Ann Circumference Surveys

A. Introduction

A high level of malnutrition among adolescent girls and women in rural Bangladesh increases the risk of low birth weight and infant mortality as well as maternal mortality and morbidity. In the baseline study and final evaluation, we quantified this risk factor for our program area by measuring mid-upper arm circumference for women of reproductive age. It should be remembered that MotherCare Project interventions focused on pregnant women and their family members, rather than on all women of reproductive age; thus, any changes in women's nutritional status between start and end of the project could not be attributed to project interventions. Moreover, the baseline and final MUAC surveys took place during different seasons. Thus, these surveys simply increase our understanding of a major risk factor.

The project area included the villages of Kunda, Moslendapur, Gokama, Chairkury and Nurpur in Nasimagar, Brahmanbaria District. At the time of the final survey, total population in the project area (as determined by manual census) was 24,195; this decrease from the midterm 1993 population reported in PMIS may reflect seasonal out-migration.

B. Methods

The baseline study was conducted in August and September, 1991, and the final survey in March, 1994. During both periods, food in Nasimagar is relatively scarce; in March, however, an inexpensive "low quality" rice is somewhat more readily available at market.

Color coded arm circumference tapes were provided by the Bangladesh Population and Health Consortium; these tapes were also marked in centimeters, with ranges of mid-upper arm circumference (MUAC) designating various levels of nutritional status as follow: C20 cm = severe malnutrition; 20.0-21.9 cm = moderate malnutrition; 21.9-22.9 cm = mild malnutrition; and > 23 cm=normal nutrition. Both baseline and final surveys were conducted by Save the Children's female community outreach workers, under the supervision of the agency's Community Health Organizers.

Information about other variables was obtained from SC's Health Information System and included in the MUAC data set: these other variables included maternal age, marital status, and socioeconomic status. (SC developed a system for socioeconomic classification of the population in its program areas based on a variety of variables including land holding, monthly cash income and food supply; approximately 70% of the population fall into the poorest classes, C and D.) Outreach workers also recorded whether a woman was pregnant or lactating at the time of MUAC measurement.

The 3974 women measured in the baseline survey represented 90% of all women aged 15 to 45 years living in the project area. The 4215 women measured in the final survey represented 81% of the 5224 women aged 15 to 45 years living in the project area.

Statistical analysis of differences between means was conducted using t tests in the SPSS software package.

C. Results

In the baseline survey, the mean MUAC for the entire population was 22.2 cm. Eight per cent of the population was severely malnourished; 32 % moderately malnourished; 23 % mildly malnourished; and 37% normally nourished. In the final survey, the mean MUAC for

the entire population was 22.6 cm. Five per cent of the population was severely malnourished; 25 % moderately malnourished; 22 % mildly malnourished; and 48 % normally nourished.

Tables 1 and 2 present findings from the baseline and final surveys, stratified according to age, socioeconomic and marital status, and by whether or not the woman was pregnant at the time of the survey. In both surveys, MUAC of non-pregnant women decreased significantly with decreasing socioeconomic status: when differences in MUAC means between non-pregnant women in different socioeconomic classes were considered, each class was found to have a mean significantly greater than the one immediately below ($p < .001$ to $p < .05$).

In the baseline survey, we observed that married women tended to have higher mean MUACs than unmarried women: this trend achieved statistical significance in the final survey ($p < .001$). Mean MUAC was slightly higher among pregnant than among non-pregnant women, but this difference was not significant.

In both the baseline and final survey, women in the 15 to 20 year age group had significantly smaller MUACs than women aged 26 to 30 years and 31 to 35 years; in the final survey, women in the youngest age group also had significantly smaller MUACS than women aged 21 to 25 years ($p < .05$). There were no significant differences in MUAC between the youngest women and those in the two oldest groups (36-40 and 4 l-45 years).

D. Discussion

We cannot be certain that the socioeconomic status of the women who were included in the survey was similar to that of those not included (approximately 10% of the total population in both baseline and final surveys). Since the proportion of C and D class families in Save the Children's project area is approximately 70%, and since 64% of women enumerated in the final survey fell into these classes, we might assume that many of the women not included in the final survey would be from these poorer classes: if these women had been included, their (probably) lower MUACs would have reduced the population mean.

The final survey showed a slight increase in mean MUAC for the entire population of women aged 15 to 45 years, as well as a decrease in the proportion of the population which could be categorized as severely malnourished by MUAC measurement. This may reflect seasonal differences in food availability.

Poorer women and teenagers had the worst nutrition status. These findings suggest that nutritional interventions should continue to be targeted toward the poorest women and should be accompanied by programs which increase economic opportunities for them and for their families. It is questionable whether education alone could significantly increase food intake by the poorest women, but findings from our K&P surveys suggest that a concentrated IEC campaign can modify eating habits, at least during pregnancy. MUAC survey findings also suggest that nutrition interventions should be directed toward younger, unmarried women: any IEC strategy which emphasizes the importance of increased food intake by adolescent girls should be targeted toward family members who control their food intake.

TABLE 1
BASELINE SURVEY

Mean MUAC by Pregnancy, SES, Age and Marital Status

Pregnant

SES	A						B																	
Marital Status	Married		Unmarried		Other		Married		Unmarried		Other		Married		Unmarried		Other		Married		Unmarried		Other	
	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#
AGE																								
15-20	22.7	0		0		0	22.9	16		0		0	22.4	50	19.2	2		0	21.6	22		0		0
21-25	22.7	0		0		0	22.7	26	22.5	1		0	22.3	72		0		0	22.0	46		0		0
26-30	22.7	0		0		0	21.7	15		0		0	22.2	47		0		0	22.1	46		0		0
31-35	26.7	2		0		0	22.7	9		0		0	22.2	11		0		0	21.9	21		0		0
36-40	23.8	0		0		0	22.1	5		0		0	22.3	14		0		0	19.8	5		0		0
41-45		0		0		0	20.5	2		0		0	20.8	1		0		0	23.0	1		0		0

Not Pregnant

SES	A						B						C						B					
Marital	Married		Unmarried		Other		Married		Unmarried		Other		Married		Unmarried		Other		Married		Unmarried		Other	
	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#	Mean MUAC	#
AGE																								
15-20	22.8	36	22.4	66	23.0	1	22.4	44	23.3	111		0	22.3	1270	22.0	190	21.6	2	21.6	70	21.5	109	22.5	1
21-25	22.7	86	23.4	51		0	22.7	90	23.3	81	21.5	2	22.3	272	22.2	96	22.2	10	22.0	222	21.9	51	22.8	10
26-30	22.8	86	24.0	1	22.8	1	22.8	107	23.4	2	21.4	2	22.2	235	23.4	2	23.1	9	22.0	184	21.0	1	23.3	11
31-35	23.5	64	25.5	2	22.3	5	23.0	85		0	23.5	1	22.0	203	20.0	1	22.1	6	21.1	162		0	22.0	15
36-40	23.2	60	19.0	1	23.3	3	22.6	76	19.0	1	22.5	5	21.9	127		0	22.3	6	21.9	101		0	21.7	15
41-45	23.4	47		0	23.1	3	22.1	64		0	22.6	4	22.1	113		0	21.7	31	22.2	54		0	21.7	61

TABLE 2
FINAL SURVEY

Mean MUAC by Pregnancy, SES, Age and Marital Status

Pregnant

SES	A						B						C						D					
M/Stat	Married		Unmarried		Other		Married		Unmarried		Other		Married		Unmarried		Other		Married		Unmarried		Other	
AGE	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC
15-20	4	22.80					9	23.06					30	22.70	2	21.35			10	22.91				
21-25	20	23.50					18	22.62					38	22.77					16	22.58			1	23.50
26-30	11	23.02			1	21.50	12	23.28					20	23.03					22	22.67				
31-35	4	21.03					6	23.28					22	22.72					16	21.89				
36-40	2	23.60					7	23.07					3	22.50					2	22.00				
41-45							1	24.00					3	20.16										

Not Pregnant

SES	A						B						C						D					
M/Stat	Married		Unmarried		Other		Married		Unmarried		Other		Married		Unmarried		Other		Married		Unmarried		Other	
AGE	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC	#	MUAC
15-20	43	23.67	95	23.16	1	21.50	60	23.00	136	22.80			150	22.80	209	22.14			82	22.55	123	21.83	2	23.50
21-25	87	23.31	24	24.03	3	24.50	95	22.60	18	22.30			309	22.70	35	23.01	9	22.84	197	22.50	11	21.37	3	22.57
26-30	77	23.21	3	25.00	1	24.70	89	23.10	3	22.20	1	21.70	238	22.80	3	22.67	7	22.31	190	22.39			14	22.96
31-35	91	23.58	3	24.40	8	23.49	113	22.70			4	21.63	274	22.60			9	22.47	190	22.52			11	22.76
36-40	43	23.91	1	20.00	6	22.87	54	23.20	1	19.20	3	21.00	132	22.00			7	23.10	93	22.23			9	21.97
41-45	42	23.82			4	22.68	68	22.80			1	27.00	113	22.10			13	22.49	54	21.96			10	21.89

IV. Review of Field-Based HIS Registers

A. Levels of Attendance at Prenatal Care Sessions

To measure present levels of PNC attendance and TT coverage, we examined pregnancy rosters of CHOs and TT rosters of FHPs. To help evaluate the likelihood that all pregnancies in the community were in fact included in the CHO's records, we compared the numbers of "possible pregnancies" recorded in FHP Family Planning rosters to the numbers of "confirmed pregnancies" in CHO rosters. We considered pregnancies for two paras (neighborhoods) in Kunda and one in Gokama. Results are as follow:

Village	possible pregnancy	confirmed pregnancy	received TT in urea.	one PNC visit	two PNC visits	>2 PNC visits
Kunda	109	109	74 (68%)	19 (26%)	69 (63%)	6 (6%)
Gokama	103	102	68 (66%)	23 (22%)	46 (45%)	15(15%)

B. Comparison of Levels of PNC Attendance and TT Coverage to Those Found in Final K&P Survey

Review of records shows levels of PNC attendance similar to those observed in the final K&P survey: in the survey, 20% of mothers reported one PNC visit; 50% reported two visits; and 12% reported more than two. Review of records showed TT coverage to be somewhat higher than that observed in the final K&P survey: according to the survey, 57% of women had received TT during their pregnancy.

Increase in PNC Attendance Since Start of Project

The percentage of pregnant women who attended PNC sessions at least twice during their pregnancy substantially exceeds percentages recorded at the time of the Midterm Evaluation (when 39% and 34% of pregnant women in Kunda and Gokarna respectively had attended PNC clinic at least twice). The increase seen in K&P surveys was more modest: the percentage of mothers who had attended two or more prenatal care sessions increased from 56% at baseline to 62% at the time of the final evaluation. The Health Program Director thought that mothers may have under-reported their attendance at PNC sessions in the final K&P survey, in part because they perceived SC withdrawing some of its primary health care services.

Limitation of TT Supplies

SC has tried to design a sustainable immunization strategy: rather than administering immunizations directly, the agency refers women and children to GOB EPI sessions: FHPs inform those who need immunizations of the date and place of the next EPI session and give them identification slips (which specify the required vaccine) to bring to the session. Thus, the project population is subject to any vaccine shortages which may be experienced by the GOB: this was certainly the case for the first six months of 1993.

In the analysis of final K&P survey results, we examined levels of TT immunization among women who did and did not attend PNC clinic: while levels were certainly higher among women who attended clinic (69 % vs. 24%), it is impressive that 31% of women who attended PNC clinic did NOT receive TT during their pregnancy. The administration of TT during PNC clinics would have allowed SC to reach these women.

V. Assessment of Changes in *Knowledge and Practice*

A. Comparison of Results from Baseline and Final Knowledge and Practice Surveys

1. Introduction

The MotherCare Project aimed to increase knowledge levels related to appropriate nutrition and care of pregnant women, mothers and newborns during pregnancy, delivery and the postpartum period. Fathers and mothers-in-law were identified as significant decision makers during an exploratory study, conducted in August 1991, to clarify causes of death and existing patterns of nutrition and care. Thus, the project's information/communication/ education strategies were directed toward husbands and mothers-in-laws, as well as toward pregnant women.

A "Counseling Booklet", consisting of color illustrations and simple text, was developed for use by SC's health outreach workers: female Family Health Visitors (who were later called Family Health Promoters) used portions of the booklet to communicate with pregnant women and their mothers-in-law during home visits; male outreach workers relied on different sections of the booklet in their communications with husbands. Messages included in the counseling booklets emphasize the importance of adequate maternal nutrition during pregnancy and lactation; prenatal care and iron intake; early recognition of and treatment for medical problems associated with pregnancy; use of a trained TBA for delivery; early recognition of and treatment for problems associated with delivery; exclusive breastfeeding during the first four months post partum; and early recognition of and treatment for medical problems in post par-turn mothers and newborns. Before the format of the counseling booklets was finalized, messages were pretested through interviews with mothers. Community support for the household IEC campaign was elicited through "launch" activities that included village leaders and religious leaders.

Other IEC materials include illustrated home-held "reminder" cards and flip charts, with illustrations and captions from the counseling booklet, which are used by CHOs during prenatal care sessions to reinforce messages to pregnant women and mothers-in-law. The project has also produced training materials for a variety of health care providers: "action cards", retained by TBAs, to remind TBAs of steps needed for safe delivery and of danger signs which warrant referral; and manuals for nurse midwives and SC's Community Health Organizers on training TBAs and on field-based case management and/or appropriate referral of complications occurring during pregnancy, delivery or postpartum.

2. Methods

To assess whether any changes in levels of knowledge or practice were associated with project interventions, Knowledge and Practice Surveys were conducted just before the initiation of project activities (November/December, 1992) and as part of the final evaluation (April, 1994).

The baseline survey was administered in 1992 to women in the project area who had delivered in September and October, 1992; to their husbands; and to their mothers-in-law. The final survey was administered in February and March, 1994 to women who had delivered in December 1993 and January, 1994; to their husbands; and to their mothers-in-law. The baseline survey captured 91% of the women who had delivered during the specified period (117 out of 129 new mothers); the final survey captured 93% of the women who delivered during the specified period (185 out of 198 new mothers). The difference in numbers of

deliveries during the baseline and final survey periods probably reflects the normal seasonality of births in Bangladesh: in SC's program area (and nationally) more births occur during the November through January quarter than during any other. Women who had delivered in the designated time interval were identified by consulting census-based health rosters maintained by SC's outreach workers. The baseline survey also included 114 husbands and 77 mothers-in-law; the final survey included 176 husbands and 119 mothers-in-law. Questionnaires used for all three groups are included in Appendix 1.

Surveys were administered by graduate students from Dhaka University, almost all of whom had conducted health or socioeconomic surveys for other organizations. Interviewers were trained and supervised by the Bangladesh Field Office Health Program Director.

3. Results

Responses given by mothers, husbands and mothers-in-law to selected survey questions are presented in Tables 1, 2 and 3 in Appendix 2; these tables allow us to compare changes between start and end of the project. Table la (also in Appendix 2) presents cross-tabulations of various variables from the mother's final K&P survey.

4. Analysis of Data from K&P Surveys:

Chi-square tests were used to assess differences between levels of knowledge and practice at the time of baseline and final surveys. The following tables give results of chi-square tests for those cases in which a significant change had occurred. We realize that when numerous differences are compared, some changes will prove significant by chance alone. Here, however, we see a consistent pattern of increased knowledge and practice.

As usual, chi square values larger than 3.84 indicate that differences are significant at $p=.05$, and values larger than 6.64 indicate significance at $p=.01$.

a. Tests on changes in mothers' knowledge and practice:

1. importance of PNC: 81% to 98%; chi square=30.17

	baseline	final
important	95	182
not important/ do not know	22	3

2. importance of increased food: 87% to 96%; chi square=9.96

	baseline	final
need more	102	177
do not need more	15	7

3. increased food intake: 29 % to 65 % ; chi square= 38.88

	baseline	final
increased	34	120
intake same/less	83	64

4. increased daily rice meals: 72 % to 87%; chi square= 11.87

	baseline	final
3-4 meals	84	161
l-2 meals	33	24

5. consumed egg/milk lx/week: 45% to 73%; chi square=25.24

	baseline	final
consumed	53	135
did not consume	64	49

6. know need to increase rest: 65 % to 92%; chi square=36.23

	baseline	final
rest important	76	170
not important	41	15

7. rested more during pregnancy: 51% to 73 %; chi square= 15.05

	baseline	final
rested more	60	135
rested same/less	56	50

8. consider Fe important: 71% to 83%; chi square=7.17

	baseline	final
important	83	154
not important/ does not know	34	31

9. took Fe: 71% to 83%; chi square=7.17

	baseline	final
took	83	154
did not take	34	31

10. felt better after Fe, among those who took: 82% to 96%; chi square= 15.23

	baseline	final
better	68	148
not better	15	6

11. used trained TBA: 71% to 75%; chi square=8.61

	baseline	final
trained	70	139
untrained/status unknown	47	46

12. used soap in delivery: 9% to 85%; chi square=174.7

	baseline	final
used soap	10	158
did not use soap	107	27

13. used plastic sheet: 9% to 60%; chi square=81.17

	baseline	final
used sheet	10	111
did not use	107	74

14. boiled blade: 79 % to 94 % : chi square= 15.86

	baseline	final
boiled	92	174
did not boil	21	9

15. knows fluid intake should increase post par-turn: 62 % to 95 % ; chi square=55.38

	baseline	final
increase fluids	73	176
do not increase	44	9

16. increased fluid intake: 61% to 84%; chi square=21.56

	baseline	final
increased	71	155
did not increase	45	29

17. restricted some foods: 64 % to 20 % ; chi square =61.75

	baseline	final
restricted	75	36
did not restrict	40	149

18. knows Fe is needed: 71% to 96%; chi square=38.72

	baseline	final
Fe needed	83	177
not needed	34	8

19. took Fe postpartum: 15% to 69%; chi square=85.47

	baseline	final
took Fe	17	127
did not take	99	58

20. gave infant colostrum: 70% to 92%; chi square=28.00

	baseline	final
gave colostrum	82	171
did not give	35	14

21. knows importance of exclusive breastfeeding: 73 % to 83 % ; chi square=4.4 1

	baseline	final
important	85	153
not important	31	32

22. gave nothing other than breastmilk first day: 18% to 37%; chi square= 13.1 I

	baseline	final
only breastmilk	21	68
other	96	117

23. thought husbands supported PNC: 56% to 89%; chi square=42.81

	baseline	final
support PNC	66	164
do not support	51	21

24. thought MILs supported PNC: 60% to 86%; chi square= 19.51

	baseline	final
support PNC	49	108
do not support	33	18

25. thought husbands supported increased food: 66% to 92 %; chi square= 34.5

	baseline	final
support more food	77	170
do not support	40	15

26. thought MILs supported increased food: 68% to 87%; chi square= 12.76

	baseline	final
support more food	56	117
do not support	26	17

27. thought husbands supported increased rest: 54% to 84 %; chi square=33.50

	baseline	final
support rest	63	155
do not support	54	30

28. thought MILs supported increased rest: 52% to 69%; chi square=4.37

	baseline	final
support rest	43	92
do not support	29	34

29. sought treatment for problems in delivery: 48% to 72%; chi square=3.96

	baseline	final
sought treatment	10	18
did not seek	11	7

30. increased fluid intake in labor: 38% to 64%; chi square=20.13

	baseline	final
increased	44	118
did not increase	71	66

31. placed nothing on umbilical stump: 19% to 43%; chi square=20.51

	baseline	final
nothing	22	80
something	91	99

32. reported “no control” in spacing children: 23% to 12 %; chi square=5.13

	baseline	final
no control	27	23
other	90	162

b. Tests on changes in husbands' knowledge and practice:

I. support for routine PNC: 57% to 65 % ; chi square =40.80

	baseline	final
support	75	155
do not support	32	5

2. know that food should be increased in pregnancy: 66 % to 92 %; chi square=3 1.84

	baseline	final
need to increase	75	161
no need	39	15

3. know need for more rest in pregnancy: 44% to 93%; chi square=89.59

	baseline	final
more rest needed	50	164
not needed	64	12

4. support intake of Fe: 85 % to 94 %; chi square =6.98

	baseline	final
support Fe	97	165
do not support	17	11

5. select TBA because she is trained: 21% to 40%; chi square= 12.57

	baseline	final
trained	24	71
gave other reason	90	105

6. know need for exclusive breastfeeding: 39% to 69%; chi square=26.89

	baseline	final
exclusive	44	121
other	70	55

7. acquired Fe: 36% to 86%; chi square=53.87

	baseline	final
acquired	41	151
did not acquire	52	25

8. thought there could he "no control" over child spacing: 34% to 6%; chi square=35.97

	baseline	final
no control	39	11
other	75	165

9. of those who thought births should be spaced more than two years apart, knowledge of modem methods of contraception: 85 % to 97 % ; chi square= 10.06

	baseline	final
modem method	34	144
other	6	5

c. Tests on changes in knowledge and practice of mothers-in-law:

1. need for high protein food: 83% to 91%; chi square=4.02

	baseline	final
need protein	64	108
do not need	13	10

2. need more rest: 57% to 82%; chi square=15.94

	baseline	final
more rest needed	44	97
not needed	32	20

3. obtained Fe for DIL: 27% to 62%; chi square=23.08

	baseline	final
obtained	21	73
did not obtain	55	45

d. Tests on association between PNC and other aspects of care in pregnancy:

1. Receipt of at least one TT during pregnancy according to whether or not mother attended PNC: chi square = 30.76

	attended PNC	did not attend
received TT	99	13
did not receive TT	44	41

2. Intake of Fe according to whether or not mother attended PNC: chi square=72.93

	took Fe	did not take
did not attend PNC	12	22
attended PNC	142	9

B. Focus Group Discussions

Summarized below are the highlights from each focus group discussion. In reviewing this summary, please keep in mind that the author has relied on translations by two other members of the Evaluation Team (Drs. Najma and Nikhil Roy).

1. Mothers who gave birth in the last 6 months:

Eleven mothers attended this session, most carrying their infants.

1. Mothers were able to repeat nutritional and safe delivery messages included in IEC materials with no prompting. They liked the pictorial reminder which SC developed and which they can keep in their own homes.

2. For problems occurring during pregnancy or postpartum, the usual chain of care-seeking is as follows: mothers first seek help from SC clinic personnel; if these personnel are not available, they turn to village doctors; they will go to hospital (Nasimagar) only if referred for a very serious problem. The GOB Family Welfare Visitor stationed in Kunda was not mentioned as a source of care: later on, mothers complained that she was often absent .

   They will take their newborns out of their home only if the newborn has a very serious problem. The following were defined as very serious: ARI, problems with breastfeeding, thrush, and cord infection.

3. The mother of one 6 month old infant who was clearly under-weight and somewhat dehydrated said that she had started feeding her infant cow's milk at three months: the infant had had frequent bouts of diarrhea. Mother was also feeding the infant from a bottle rather than with a spoon. The infant was also still breastfeeding, and mother was advised on safe feeding practices as well as how to increase breastmilk.

2. Husbands of mothers who gave birth in the last six months:

Twelve husbands attended this session.

I. Husbands were easily able to communicate messages on prenatal care and nutrition, and cited the IEC booklet and health outreach worker as the source of these messages. They were glad that outreach workers were communicating with their wives. They emphasized that mothers should eat more even after delivery: they pointed out, however, that meat and fish were expensive and were consumed only rarely. Husbands had collected materials needed for delivery (at the direction of the mothers) and knew that blade and thread needed boiling. Husbands had often collected Fe for their wives, and knew that Fe was needed for three months before pregnancy and two months after. They supported their wives' attendance at PNC clinic: sometimes they brought them to the clinic themselves, and sometimes their wives were escorted by their mothers (mother-in-law of pregnant woman).

2. Husbands said that there had been a decrease in tetanus deaths over time, and recognized the impact of TT.

3. In case of problems during delivery, husbands said they would agree to what TBAs advised. "Nowadays, TBAs are good: they have training, and we can rely on them."

4. With regard to family planning, husbands first said that two children were enough, even two girls. Later, they said that families should have no more than three children. They mentioned that the GOB FP worker was supposed to visit each home in every one or two month period, but in reality did so every two or three months.

5. With regard to sources of care: Husbands were displeased that SC had discontinued its primary care clinic. Now, they tended to rely more on village doctors, who they considered poorly trained and expensive; in response to the FGD Facilitator's suggestion that SC train the village doctors, they said, "After receiving training, village doctors will have bigger egos and will charge more. But at least with training, they will diagnose properly." They suggested that some income generating activity be undertaken to sustain the PHC clinic, and named the fish pond as a possibility: the facilitator pointed out that they had failed previously to make a success out of the fish pond, and they said, "The problem is that we do not have unity amongst ourselves."

   If newborns or post partum women became ill, they would not hesitate to seek treatment: proscriptions against leaving the home were not important in those cases. They recognized, however, that it would be useless to go to Nasirnagar hospital and expensive to go to Brahmanbaria (especially if the patient had to be carried in a hanging basket): thus, before going to the hospital, they would try to get help from SC.

6. Husbands recognized that SC started "weighing children to see if they are growing well" and said that "previously we thought weighing was a bad practice." It was unclear whether they realized that--as of last fall--growth monitoring is no longer conducted by SC's health outreach workers.

3. Mothers-in-law of women who gave birth in the last six months

This session was attended by 11 mothers-in-law.

1. Comments of mothers-in-law reflected a clear understanding of IEC messages, and also a realistic understanding of constraints to changing behaviors:

a. MILs said that "nowadays" they brought their DILs to clinic and EPI sessions, collected Fe for them, and tried to provide "a little more food." Although they recognized that more rest was needed during pregnancy, they said that "this is not always possible in the village; instead, try to do work with the help of others."

b. They understood the connection between increasing levels of TT immunization and decreasing tetanus, or "red and blue disease."

c. Even though they knew that TBAs have safe birth kits, they tried to gather blade, thread, clean (old) cloth and soap in their own homes.

d. They said that only gentian violet--if anything--should be applied to cord. Previously, many different materials had been applied to the cord.

2. They seemed to accept the idea of family planning and said they learned of the option through the IEC booklet ("Dream come true"): "There is no need for more than three children in nine years".

3. With regard to seeking care for maternal post partum or neonatal problems: "There is the custom of not going out after birth, but custom is not that important if mother needs treatment for problems." Treatment was first sought from the SC CHO; if SC staff were

not available, they took mothers or newborns to village doctors: "...but as they are more expensive, we prefer to go to clinic first. " ARI was identified as a serious problem for the newborn, for which treatment would be sought.

4. MILs said that if they understood the health problems of their DILs, they could care for them better. One said, "This is the care I would want for my daughter. Why should I not want it for my daughter-in-law?"

5. With regard to well child care: MILS could identify immunization-preventable diseases and attributed the fall in such diseases to immunization; they knew that the age for measles immunization was nine months. They recognized that SC had stopped its growth monitoring program: "Now a days, there is no weighing. In the past, they used to advise frequent feeding if the child was not growing or had low weight."

4. Community Leaders

This session was attended by six community leaders.

1. They said that cooperation with SC had increased their status in the community.

2. They pointed out that SC had discontinued its "hospital" (PHC clinic) and pointed out that "If SC continues to give service to the community, it would be a better way of serving the village people. "

3. They said that services provided by GOB facilities were poor: GOB FP workers are not regularly present in the villages.

4. They pointed out that treatment in hospital was expensive; such expense made it difficult for village people to follow advice on referral.

5. Traditional Birth Attendants

This session was attended by twelve TBAs who had conducted between 5-10 deliveries each during the last year.

1. TBAs described procedures for safe delivery and said that now--after SC training--mothers usually had the necessary items ready at home. They mentioned the importance of taking Fe, attending PNC and receiving TT. They knew that putting the newborn to breast could increase the speed of placental delivery and that frequent breastfeeding could increase the supply of breast milk.

2. Malpresentation, edema, seizures and prolonged labor were cited as complications which they would refer, first to SC staff and then to Nasimagar hospital.

3. TBAs said that their status in the community had increased as a result of their training: husbands usually listened to their advice on referral, though MILs sometimes balked at the idea of their DIL being examined by a male doctor. Even in cases of stillbirth, husbands now thanked them for at least trying to deliver the infant.

4. They said that they do not charge for their services. Sometimes they received money, soap or clothing from the families who they had assisted.

6. Village Doctors (allopathic practitioners with varying levels of formal training)

The ten village doctors who attended the session had been in practice from 5 to 25 years.

1. They said that the conditions they treated consisted mainly of diarrhea, dysentery, ARI, skin infection, and fever. The facilitator asked them how they treated diarrhea: they said that they prescribed ORS packets or showed mothers how to make home mix; "…but in cases of severe disease, the community prefers IV therapy." Later they said that they used Cotrimoxazole for dysentery.

2. Because in-hospital care is costly, they said that most patients preferred care from the village doctor over care in hospital. They would, however, refer severe cases to the hospital. Generally, they said, GOB services were no good.

3. They said that SC activities had not reduced their practices.

4. They said that they treated poorer patients on credit, making most of their profit from their wealthier patients; they said that 50% of their patients were treated on credit. The possibility of offering free care to the poor one day per month was not acceptable to them: they said that such free care would exhaust their supplies; they said they could only do this if they were given some supplies at no cost.

5. Only one of the village doctors sold any contraceptive supplies; the others feared that families would get angry.

6. They expressed a desire for more training: "SC has worked in this area so long and has trained TBAs, CHOs and nurse midwives--but the agency has never paid any attention to us." They wanted to know how to differentiate (according to symptoms) presentations of eclampsia, hysteria and tetanus.

7. They say they still give Syntocin "for pushing" during labor (5 u I.V.); they said they were not aware of any problems associated with this practice and claimed not to have seen any deaths related to it.

7. **Community Health Organizers and nurse midwives**

FGDs with CHOs were held in Kunda and Gokama; two staff members were interviewed at each site.

1. Poverty and "religious-mindedness" prevented many families from following advice for referral. Still, CHOs referred serious complications to hospital; they cited malpresentation as a condition they would refer.

2. They said that they wanted more training but did not specify in what.

C. Discussion: Changes in Levels of Knowledge and Practice Based on K&P Survey and Focus Group Discussions

Both K&P survey results and focus group discussions show clear and significant increases in levels of knowledge on the part of mothers, husbands, and mothers-in-law. All groups are more aware and supportive of behavioral changes

1. that can improve the health of women during pregnancy: e.g., attendance at PNC, increase in food consumption, intake of iron tablets, and increased rest; and

2. that can improve the health of mothers and newborns post partum: e.g., increased maternal fluid intake, avoiding food restrictions, intake of Fe, feeding colostrum, exclusive breastfeeding through the first four months after birth, and controlling fertility through modem contraception.

There was also a significant increase during the course of the project in mothers' perception of support from other family members (husbands, mothers-in-law) for protective health behaviors.

It should be noted, however, that levels of knowledge about protective behaviors were--with respect to most issues--not extremely low at the start of the project. The important question thus becomes, "How well were increased levels of knowledge and perception of support translated into increased practice?"

The K&P survey did show significant increases in certain protective practices:

I. intake of iron tablets during and after pregnancy:

Perhaps the clearest improvement concerned the intake of iron; by the end of the project, high proportions of mothers reported taking Fe (and feeling better after doing so!), and high proportions of husbands and mothers-in-law reported that they helped obtain Fe.

2. improved nutrition during pregnancy and lacration, and breastfeeding practices:

By the end of the project, a higher proportion of mothers reported that they ate more during pregnancy; there were increases in daily consumption of rice meals and weekly consumption of milk or eggs. However, the proportion of husbands and mothers-in-law who reported that they tried to obtain "special foods" for pregnant women did not increase significantly.

There was a significant increase in the proportion of mothers who fed their infants colostrum and **who** gave only breastmilk on the first day. When we considered proportions of mothers who were still breastfeeding exclusively at the time the survey questionnaire was administered, however, there was no change from levels at the start of the survey--even though a significantly higher proportion of mothers recognized the value of exclusive breastfeeding. This may reflect mothers' continued perception that their breastmilk is insufficient.

3. attendance at PNC sessions

Based on K&P survey results, we cannot claim that the proportion of women who attended two or more prenatal care sessions had increased significantly by the end of the project. Review of PNC registers, however, did reveal an increase in level of attendance.

This is encouraging, as cross-tabulation of results from the final K&P survey showed that women who attended PNC were more likely to take Fe and to receive TT during pregnancy.

4. increased rest during pregnancy

A higher proportion of mothers reported that they rested during pregnancy. In FGDs, however, mothers-in-law pointed out how difficult it was to find time to rest in the village.

5. increased use of trained TBAs and practice of hygienic delivery techniques

Given SC's TBA training activities, it was no surprise that by the end of the project a higher proportion of mothers were using trained TBAs. A higher proportion of husbands (but not mothers or mothers-in-law!) cited training as the reason for TBA selection. By the end of the project, significantly higher proportions of mothers reported that they had used soap and plastic sheets during delivery, and had boiled blades; fewer mothers were placing anything on the umbilical stump.

6. perception of problems during pregnancy and delivery, and willingness to seek treatment

It was difficult to assess from these survey results changes in ability to identify potentially serious problems during pregnancy or willingness to seek treatment for problems: mothers reported that they ignored many problems in pregnancy because they thought they were "not serious"; not all problems which mothers and other family members identified as serious were necessarily specific to pregnancy. During FGDs, however, all groups were able to name problems which were more likely to occur during pregnancy, and which warranted referral; likewise, they were able to cite complications during delivery for which they would seek advanced care.

According to the K&P survey, there was no change in the proportion of women who sought treatment for problems experienced during pregnancy. There was a significant increase, however, in the proportion of women who sought treatment for complications during delivery. The most common problem identified during delivery was prolonged or delayed labor; "fever" was the most common problem reported in the post partum period; and symptoms of AR1 were the most commonly reported problem of the newborn.

FGDs and K&P surveys indicated that for problems in pregnancy or delivery, women and their families would begin by seeking care from local providers (SC personnel, who were more likely to be consulted for problems in pregnancy, and village doctors, who were more likely to be consulted for problems in delivery); only if these local providers were unavailable or unable to help would they go to hospital. FGDs suggested that the TBA training program had improved the status of TBAs to the point where their advice on the need for more advanced care was generally heeded: even after TBAs advised referral, however, families would try to obtain help from NMWs or village doctors. Focus groups expressed dissatisfaction with some government providers, complaining that these providers were not present at their posts at scheduled times.

The most common reason given by mothers for not seeking treatment for a problem occurring during pregnancy was their perception that the problem was not serious. Next, they cited lack of money. Financial constraints limit the extent to which mothers and families can turn to village doctors for help: even though village doctors claimed to treat the poorest members of the community on credit, mothers-in-law and husbands said that their care was expensive. While training village doctors may not greatly increase access to treatment for complications, it should certainly be undertaken in order to improve the quality of their

practice: their administration of syntocin to women in labor is just one of many practices that may adversely affect the health of mothers and infants.

The ability of nurse midwives and CHOs to manage cases in the field is severely limited by SC's proscription against the use of injectable antibiotics or IV drugs or fluid replacement: even though nurse midwife case management protocols clearly require these capabilities, nurse midwives and CHOs have been instructed to refer women and newborns requiring such treatment to hospital, or to government FHVs or village doctors if hospital transfer is not immediately possible or is refused. SC BFO staff believe that if the agency were to offer such treatment, it would increase community reliance on a source of care that will not be sustained after the end of the CS8 project and might increase the agency's liability for any mishaps.

Given this philosophy, it is imperative that agency personnel improve the case management abilities of local government and non-government providers and strengthen logistics to ensure that government providers have access to adequate supplies. SC can establish channels for communication between village leaders and thana-level administrators: dialogue on family planning issues with thana-level administrators has already been initiated; such dialogue should be broadened to include issues related to emergency obstetric treatment and other aspects of reproductive health.

VI. Analysis of Postnatal Questionnaires

A. Introduction

Several MotherCare Project activities were designed to train families and health care providers to recognize potentially dangerous problems during pregnancy, delivery and the postpartum period and to seek help for such problems from appropriate sources in a timely way. Health care providers who were targetted for training included traditional birth attendants (TBAs), and Save the Children health staff (Community Health Organizers and nurse midwives). The postnatal questionnaire was developed as a management tool--to identify TBAs and other providers whose practices were unsatisfactory and to offer them further training--as well as a tool for evaluation of project impact on management of complications and consequent morbidity and mortality.

B. Methods

The postnatal questionnaire (included in Appendix 3) was administered to all mothers who had delivered (or to a family member, in case of maternal death) within two weeks after delivery; the number of infant deaths captured through these questionnaires cannot, therefore, be used to calculate infant mortality. Questionnaires were administered by CHOs.

This study is based upon responses in the 197 questionnaires administered in December, 1993 and January, 1994. The group of women represented by these questionnaires, therefore, is almost the same as the group which participated in the final K&P survey.

Data were analyzed using SPSS.

Because of staff turnover (especially in Gokama), the BFO MotherCare Project Principal Investigator thought that the quality of information collected in the postnatal questionnaires was probably inferior to that in the K&P survey.

C. Results

1. GENERAL DESCRIPTIVE INFORMATION

total respondants: 197

Birth outcome:

There is some discrepency between the number of stillbirths and neonatal deaths recorded in birth registers for December 1993 and January 1994 and the number of stillbirths and neonatal deaths captured in the postnatal questionnaires--granted even that we would not expect to capture all neonatal deaths which occurred during this period in the postnatal questionnaires because tney were administered just two weeks after birth. Part of this error arises from the loss of three questionnaires which had been sent back to the field from Dhaka for verification of information. Also, the death of one newborn, recorded in the postnatal questionnaire, was not captured in the death register; reasons for this failure to record a neonatal death are being investigated. During their field visit, members of the FET tried to clarify the nature of the discrepency between stillbirths and neonatal deaths recorded in death registers and postnatal questionnaires by creating the following table:

village	neonatal deaths which occurred within 2 weeks after birth and should have been included in PNQs (according to register)	neonatal deaths which were included in PNQs	still-births which should have been included in PNQ (in register)	still-births which were in PNQ
Kunda	4	2	2	0
Moslendapur	0	0	1	0
Gokama	0		0	
Chairkury	0		0	
Nurpur	1	2	2	2

Case descriptions for all the neonatal deaths and stillbirths recorded in postnatal questionaires are included in Appendix 4.

Of the 191 live born infants, 46.6% were female. There were no maternal deaths during this period.

Size and gestational age of infant: Respondants thought that 96.5 % (190) of infants were of normal size at birth; 2.5% (5) were small; and 1.0% (2) were large. 97.5% of infants were full term and 2.5% were pre-term.

Parity: 39.0% of infants were the products of first or second pregnancies, 30.5% of third or fourth pregnancies, 16.8% of fifth or sixth pregnancies, and 13.7% of sixth or higher order pregnancies.

Maternal age: 9.6% of mothers were younger than 20 years; 41.6% were 20-25 years; 29.9% were 26-30 years; 14.3 % were 31-35 years; 3.6% were older than 35 years; and 1% were of unknown age.

Place of delivery: 89.3% of infants were born in the project area and 10.7% outside. 82.7% of infants were born at the home of the husband's family; 16.8% at the home of the mother's parents; and .5% elsewhere.

2. PRENATAL CARE

Attendance at ANC: 46.7% of the mothers had attended ANC two or more times during their pregnancy; 25.9% one time; and 27.4% had not attended. Of those who attended one or more. times, 81.4% initiate3 care in the second trimester; 16.4% in the third trimester; and for 2.2%, time of PNC initiation was unknown.

Immunization *for tetanus:* 10.2% of mothers had never received TT; 3.0% had one TT; 22.3% had two TTs; and 64.5% had more than two TTs.

Problems during pregnancy: 10.2% of mothers (20) reported that they had experienced some problem during pregnancy; 89.8% reported no problem. All mothers who reported a problem had sought treatment: 75% went to the SC PNC clinic and 25% sought treatment from some other source. The 20 mothers who had experienced problems reported a total of 36 problems, as follow:

lower abdominal pain--38.9% (of problems)
fever--8.3 %
mouth sores--5.6 %
dysentery--8.3%
excessive vomiting--5.6 %
lower back pain--13.9%
epigastic pain/burning--8.3 %
leg pain--8.3 %
insomnia--2.8 %

All of these problems were treated, either by SC health personel or by some other providers: 83.3% of all problems (as opposed to women) were treated by SC staff and 16.7% by other providers.

3. DELIVERY AND TBA PERFORMANCE

Frequency of complications in delivery: 91.9% of mothers (180) reported no problems during delivery; 8.1% (16) reported some problem. The 16 mothers who reported problems cited a total of 22 complications, as follow:

delayed delivery--41 .O %
PROM--22.7 %
malpresentation-- 18.2 %
antepartum hemorrhage--4.5 %
delayed delivery of placenta--13.6 %

Management of problems in delivery: Eight of the 16 women who reported complications during delivery were treated for those complications; eight were not treated. Of those who reported "treatment": 5 were referred by TBAs to hospital; one called an SC worker, who referred her to hospital; and two called the village doctor, who managed the complication on site. Of the six mothers referred to hospital, two went; in one case, the TBA brought the FWV from the hospital to the mother's home.

Reasons for lack of treatment ofproblems in delivery: Of the eight mothers who experienced problems in delivery but did not report "treatment" for those problems, five thought that the problem was not serious enough to warrant treatment; two reported lack of assistance (their husbands were away) as an obstacle; one cited religious beliefs as an obstacle; and one cited lack of money.

Training of TBA: Of the 176 deliveries which occurred in the project area, 69.3% were managed by recently trained TBAs and 30.7% by untrained TBAs.

Management of routine delivery by trained vs. untrained TBAs:

Since the TBA training course focused on hygienic management of normal delivery as well as recognition of complications, the following analysis was conducted to see whether trained TBAs performed differently from untrained TBAs. Chi square values are included in cases where practice of trained TBAs differs significantly from practices of untrained TBAs. Here, the "trained" category includes completely and partly trained TBAs.

	trained	untrained	total
used kit box	75 (62%)	11 (20%)	86
did not use kit box	47	43	90
total	122	54	176

chi square=23.69

	trained	untrained	total
used plastic sheet	88 (72%)	26 (48%)	114
did nbt use plastic sheet	3 4	28	62
total	122	54	176

chi square=8.41

	trained	untrained	total
washed with soap and water	115 (94%)	43 (79%)	158
did not wash	7	11	18
total	122	54	176

chi square=7.20

	trained	untrained	total
massage oil in birth canal	88 (72%)	37 (69%)	125
did not massage oil	34	17	51
total	122	54	176

	trained	untrained	total
used holy water	23 (19%)	12 (22%)	35
did not use holy water	99	42	141
total	122	54	176

	trained	untrained	total
hypothermia prevented	86 (70%)	14 (26%)	100
hypothermia not prevented	36	40	76
total	122	54	176

chi square=28.51

	trained	untrained	total
new blade used to cut cord	120 (98%)	51 (94%)	171
other cutting implement	2	3	5
total	122	54	176

	trained	untrained	total
boiling of cutting tool	119 (98%)	47 (87%)	166
no boiling	3	7	10
total	122	54	176

chi square=5.87

	trained	untrained	total
nothing applied to cord	99 (81%)	37 (69%)	136
Gentian violet applied to cord	5 (4%)	2 (4%)	7
other material applied to cord	13 (11%)	10 (190%)	23
unknown	5	5	10
total	122	54	176

TBA's advice on post partum care:

	trained	untrained	total
advised to eat more	117 (96%)	40 (74%)	157
did not advise to eat more	5	14	19
total	122	54	176

chi square= 16.32

	trained	untrained	total
advised to drink more	19 (16%)	4 (7%)	23
did not advise to drink more	103	50	153
total	122	54	176

	trained	untrained	total
advised to restict some foods	2 (2%)	2 (4%)	4
did not advise food restriction	120	52	172
total	122	54	176

	trained	untrained	total
advised to take iron	45 (37%)	13 (24%)	58
did not advise to take iron	77	41	118
total	122	54	176

	trained	untrained	total
advised to feed colostrum	110 (90%)	35 (65%)	145
did not advise to feed colostrum	12	19	31
total	122	54	176

chi square= 14.87

	trained	untrained	total
advised exclusive breastfeeding	59 (48%)	24 (44%)	83
did not so advise	63	30	93
total	122	54	176

	trained	untrained	total
advised to seek help for problems	55 (45%)	5 (9%)	60
did not so advise	67	49	116
total	122	54	176

chi square= 19.81

	trained	untrained	total
counselled on family planning	32 (26%)	1 (2%)	33
did not counsel	90	53	143
total	122	54	176

chi square= 13.04

4. MOTHER'S CONDITION POST PARTUM

Frequency of complications postpartum: 93.4 % of mothers (184) reported that they had no complications post partum; 6.6% (13) reported that they had some complication. The 13 mothers who experienced some problem post partum mentioned a total of 16 problems, as follow:

fever--37.5 % (of problems)
bleeding--6.3 %
lower abdominal pain--25.0 %
others--3 1.3 %

The possible association between maternal post partum complications and TBA training (or various TBA activities) was explored through the following cross tabulations:

	untrained	trained	total
post partum problem	3 (4%)	10 (8%)	13
no problem	70	114	184
total	73	124	197

	washed hands	did not wash	total
post par-turn problem	12 (7%)	1 (6%)	13
no problem	162	17	179
	174	18	192

	boiled	did not boil	total
post partum problem	12 (7%)	0 (0)	12
no problem	172	7	179
	184	7	191

post pat-turn problem	55(10%)	7 (5%)	13
no problem	61	129	184
		136	197

In no case was there an association between a specific TBA practice and the occurrence of a problem post partum.

Management of complications post panum: Three of the 13 mothers whc reported a problem did not seek treatment; 3 called a TBA; 5 consulted an SC worker; and three consulted the village doctor. Of the ten mothers who were treated, six were treated by an SC worker, three by the village doctor, and one in hospital

Reasons for not seeking treatment: Of the three mothers who did not seek treatment for their problems, one felt the problem was not serious; one had no one to help her at home; and one had no money.

Food/fluid intake: 22.3% of mothers reported that they were eating more since delivery; 1.5 % were eating less; and 75.7% were eating the same amount after delivery as before. 16.8% of mothers reported that they were drinking more since delivery; 2.5 % were drinking less; and 79.2% were drinking the same amount after delivery as before.

5. INFANT'S CONDITION (applies only to livebom infants)

colostrum: 90.6% of infants had received colostrum.

exclusive breastfeeding: 62.3% of infants had received only breastmilk since delivery; 37.7% had also received some other type of fluid or food.

neonatal problems: 84.8 % of mothers of live born infants (162 mothers) reported that their newborns had experienced no problems since delivery, and 15.2% (29 mothers) reported some type of infant problem. The 29 mothers who reported that their infants had problems mentioned a total of 35 problems, as follow:

poor suckling/weak--17.2% (of problems)
skin infection--14.3%
thrush--5.7%
cord infection--l 1.4
cough/cold--3 1.4
others--20.0

The association between neonatal problems and TBA training or some specific activities surrounding delivery is explored in the following tables. Chi square values are given in cases where there appears to be a significant association.

	not trained	trained	total
neonatal problem	16 (22%)	13 (10%)	29
no problem	57	111	168
total	73	124	197

chi square=3.91

	washed hands	didn't wash	total
neonatal problem	26 (15%)	3 (17%)	29
no problem	148	15	163
	174	18	192

	boiled	did not boil	total
neonatal problem	28 (15%)	1 (14%)	29
no problem	156	6	162
	184	7	191

	nothing/ Gentian Violet to cord	other to cord	total
neonatal problem	20 (13%)	7 (29%)	27
no problem	140	17	157
	160	24	184

chi square=6.05

The association between infant problems and breastfeeding practices and maternal TT immunization is explored in the tables below:

	exclusive breastfeeding	supplemental feeding	total
no problem	115	53	168
neonatal problem	10 (8%)	19 (26%)	29
	125	72	197

chi square= 10.88

(One case of thrush occurred in an exclusively breastfed infant and the other in an infant who received supplements.)

	OTT	>/= 1 TT	total
problem	14 (17%)	15 (13%)	29
no problem	71	97	168
total	85	112	197

	<2 TT	>/= 2 TT	total
problem	3 (12%)	26 (15%)	29
no problem	23	145	168
total	26	171	197

Management ofproblems: Eight of the 29 mothers who reported a problem in their newborn did not obtain treatment for that problem. Information about the course of action taken by six of the mothers was missing. Of the 15 mothers who were known to seek treatment, 4 sought help from a TBA; 8 from an SC worker; 5 from a village doctor; and 1 took her infant to the hospital.

D. Discussion of Results from Postnatal Questionnaires

1. Comparison to K&P Survey

Compared to results of the final K&P survey, postnatal questionnaires showed a lower level of attendance at PNC clinic; a lower incidence of problems in pregnancy and delivery; a higher proportion of problems during pregnancy being treated by SC staff; and a lower proportion of problems in delivery being treated at all. Because the postnatal questionnaires were administered within two weeks postpartum, we would have expected that more problems during pregnancy and delivery would have been reported than were reported through the K&P survey. Lack of previous program experience on the part of SC staff who administered the postnatal questionnaires, especially in the Gokama area, may have affected the quality of data collected.

2. Implications for Case Management

We compare practices between trained and untrained TBAs and explore the association between TBA training/practice and maternal and neonatal problems, again remembering that when a large number of statistical tests are done, some are likely to show a significant difference by chance alone.

3. TBA Practice and Care of Newborns

With regard to most hygienic precautions, the practice of trained TBAs was significantly better than that of untrained TBAs. Although trained TBAs were somewhat more likely to apply nothing (aside from Gentian Violet) to the umbilical stump, the difference between trained and untrained TBAs with respect to this behavior was not significant: it is important to strengthen TBA training in this area, as results showed a significant association between application of materials (other than GV) to the cord stump and the incidence of neonatal problems. Likewise, trained and untrained TBAs were equally likely to apply oil to the birth canal--hence another area for strengthened training.

There was no association between delivery by a trained TBA and incidence of maternal problems post partum. Infants who were delivered by trained TBAs, however, were significantly less likely to show neonatal complications than those who were delivered by untrained TBAs.

Infants who had been exclusively breastfed for the first two weeks of life were significantly less likely to have problems than those who received other foods as well as breastmilk.

4. Management of Complications

Proportionately more problems which occurred during pregnancy were treated than problems which occurred during delivery, mostly by SC staff.

In both the postnatal questionnaires and in the K&P survey, prolonged labor accounted for most complications cited during delivery. In the postnatal questionnaires, women who experienced problems during delivery but who failed to follow advice for referral gave as their reasons lack of help at home (i.e., absence of husband), belief that the problem was not serious, and religious convictions, as well as lack of money.

Fever and lower abdominal pain accounted for most maternal post par-turn problems, and ARI for most neonatal problems. SC staff and village doctors were consulted for most of these problems, again emphasizing the need for improved field-based case management.

It proved to be impossible for FET members to compare the management of prenatal, post partum and neonatal problems as reported in the postnatal questionnaires to management reported in the records of CHOs and nurse midwives: many of the problems described by mothers on the postnatal questionnaires were never presented at clinic or differed from those reported on Annotated Prescription Forms.

In an attempt to assess clinic based case management, the FET did systematically review Annotated Prescription forms which had been filled out by CHOs in Kunda and Gokama during the months of May and December, 1993; (a copy of this form is included in Appendix 5.) One matter of concern is the use of oral Ampicillin drops to treat AR1 in neonates: review of death registers showed that no newborns treated in this manner had died, but it is important for the BFO health staff to follow WHO protocols for AR1 treatment; if there is a departure from these protocols, it should only be with the advice of infectious disease experts and with the understanding that neonates NOT treated with injectable antibiotics will truly receive very close follow up. Likewise, BFO health staff should observe CHO case management first hand, in order to train CHOs to avoid inappropriate use of antibiotics.

APPENDIX 1

Questionnaires used for Mothers, Husbands and Mothers-in-Law in Knowledge and Practice Survey