2013

Shaping Demand and Practices to Improve Family Health Outcomes: Findings from a Quantitative Survey, Volume 3: Bihar

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Shaping DEMAND and PRACTICES to Improve Family Health Outcomes: Findings from a Quantitative Survey

Designing a Behavior Change Communication Strategy in India

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Volume 3: Bihar

Population Council

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The Population Council confronts critical health and development issues—from stopping the spread of HIV to improving reproductive health and ensuring that young people lead full and productive lives. Through biomedical, social science, and public health research in 50 countries, we work with our partners to deliver solutions that lead to more effective policies, programs, and technologies that improve lives around the world. Established in 1952 and headquartered in New York, the Council is a nongovernmental, nonprofit organization governed by an international board of trustees.

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Suggested citation: Khan, M. E., F. Donnay, T. Usha Kiran, and K. Aruldas. (eds). 2013.
Shaping Demand and Practices to Improve Family Health Outcomes: Findings from a Quantitative Survey
New Delhi: Population Council.

Cover photo by: Isha Bhatnagar, Courtesy of the Population Council

To Our Daughters Who Are the Future Mothers

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Abbreviations

ANC	Antenatal Care
ANM	Auxiliary Nurse Midwife
ASHA	Accredited Social Health Activist
AWW	*Anganwadi* Worker
BCC	Behavior Change Communication
BCG	Bacillus Calmette-Guérin
CHC	Community Health Center
DHS	Demographic and Health Survey
DLHS	District Level Household Survey
DPT	Diphtheria, Pertussis, and Tetanus
EmOC	Emergency Obstetric Care
ICDS	Integrated Child Development Services
ICT	Information and Communication Technology
IEC	Information, Education, and Communication
IFA	Iron and Folic Acid
IIPS	International Institute for Population Studies
IPC	Interpersonal Communication
IUD	Intrauterine Device
IYCF	Infant and Young Child Feeding
JHUCCP	Johns Hopkins University Center for Communication Programs
JSY	Janani Suraksha Yojana
JSBY	Janani Bal Suraksha Yojana
KAP	Knowledge, Attitude, Practices
LAM	Lactational Amenorrhea Method
LHV	Lady Health Visitor
MDGs	Millennium Development Goals
MIL	Mother-in-law
NFHS	National Family Health Survey
NRHM	National Rural Health Mission
OCP	Oral Contraceptive Pill

OR	Odds Ratio
PHC	Primary Health Center
PHN	Public Health Nurse
SBA	Skilled Birth Attendant
SHC	Sub-health Center
SHG	Self-help Group
SLI	Standard of Living Index
STSC	Skin-to-skin Care
TBA	Traditional Birth Attendant
TFR	Total Fertility Rate
TT	Tetanus Toxoid
UNICEF	United Nations Children's Fund
VHND	Village Health and Nutrition Day
VHSC	Village Health and Sanitation Committee
WHO	World Health Organization

Sanjay Kumar, IAS
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-cum-
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सचिव, स्वास्थ्य
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Foreword

Several recent systematic reviews have documented that simple home and community based interventions in the area of reproductive, maternal, newborn and child health and nutrition (RMNCHN), implemented at scale can considerably reduce maternal, new born and child mortality and morbidity, under nutrition in settings characterized by high disease burden and weak health systems. For example, a review of strategies for reducing maternal mortality highlights that effective intra-partum care is an overwhelming priority to bring down high rates of maternal mortality. Likewise, if a combination of universal outreach (for example, routine antenatal care and immunization) and family-community care (i.e. behaviour change communication and community mobilization efforts to promote the adoption of improved antenatal, intra-partum and postpartum care practices, and care-seeking for illness) could reach 90 percent of the relevant population, an estimated 18-37 percent of neonatal deaths could be averted.

It is recognized that socio-cultural and structural barriers, including limited knowledge, socio-cultural norms, misconceptions about health promoting behaviours, limited autonomy and self-efficacy of women, and poor access to healthcare underlie the low uptake of practices, highlighted above, but these are incompletely understood. Moreover, communication strategies are recognized to play a powerful role in addressing many of the social and structural barriers and in shaping demand for and the adoption of preventive practices related to reproductive and child health. However, available evidence suggests that access to BCC in the area of RMNCHN is far from universal, particularly among women in the northern states including Bihar.

There were certain drawbacks of communication methods used in the past. First, often the communication initiatives have not been evidence based that is, their content has neither been developed based on research that identifies either the key interventions that are likely to create high impact or the social and structural barriers to behaviour change. Second, few have integrated and synergized communications using multiple channels; they often depend heavily on mass media, none of which reach more than half the targeted audiences in rural area in northern India. Third, most communication initiatives have failed to ensure alignment across behavioural targets, communication channels and messages. Fourth, most initiatives undertaken so far have tended to disseminate one size fits all rather than communicating focused messages for specific population groups among whom behaviour change is most required and can have optimal impact. Fifth, beyond actual exposure to behaviour change messages is the issue of the relevance of message content. Messages are often imparted in a somewhat technical way and are rarely conveyed in the local dialect, making it difficult for the local audiences to absorb the nuances of the messages. Sixth, while little is known about the effectiveness of the efforts made to improve the interpersonal and technical skills of the health service providers to act as change agents, available information indicates that a number of factors including lack of training, dearth of relevant information materials and tendencies of providers to accede to traditional social norms hinder their ability to promote appropriate preventive practices. Finally, relatively few initiatives have been rigorously evaluated and documented. As a result, lessons that can be drawn for scaling up these initiatives are limited.

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These reviews suggest that, social norms and practices can be altered through socially acceptable and culturally contextualized messages using mass media, mid media and interpersonal interaction between the frontline health workers and the families and communities at large.

This publication of Shaping Demand and Practices to Improve Family Health Outcomes: Findings from a Quantitative Survey, provides the framework of the behaviour change communication strategy developed on the basis of review of the existing literature and a BMGF funded analysis of a detailed formative study carried out by the Population Council in Bihar. This study presents the latest large scale authentic data pertaining to key RMNCHN indicators in Bihar. The study findings could be used in planning and developing program strategies. The pathways communication models suggested in the book can be used to fill in gaps in disseminating knowledge, design communication messages and plan behaviour change communication management . I hope both researchers and program managers will find equally useful for them.

Place: Patna
Date: 15 October 2013

(Sanjay Kumar)
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Acknowledgments

We are grateful to the Bill & Melinda Gates Foundation (BMGF) for their financial support and guidance through the project. Apart from financial support, senior staff of the Foundation actively participated as partners at each stage of the project, critically reviewed the findings, and guided in improving its program relevance. Their contribution is gratefully acknowledged. This publication would not have been possible without the continued generous financial support of BMGF.

This report is the result of a study on *Shaping Demand and Practices to Improve Family Health Outcomes in Northern India* conducted in 2010–11. The study has benefitted from the inputs of a number of persons. We are very much thankful to Dr. Bert Pelto for his continued interest in the study and guiding the design of the qualitative study. The findings from both Uttar Pradesh and Bihar have been published by the Sage Publications under the title of *Shaping Demands and Practices to Improve Family Health Outcomes*. Volume 1 refers to Uttar Pradesh study and Volume 2 refers to the qualitative part of the Bihar study besides other articles on media and Information Communication Technology. This volume provides comprehensive findings from a large scale quantitative survey and is complementary to two volumes published by the Sage Publications.

We would like to express our appreciation for Mr. Sanjay Kumar, Secretary, Health and Executive Director, Bihar State Health Society; and Dr. A. K. Shahi, State Programme Officer, Bihar Health Society, who participated in several project meetings and the final dissemination conferences held at Patna, Bihar and Delhi. We have benefited greatly from their significant inputs. We would also like to acknowledge the valuable contribution of several other central and state government officers at different stages of the project.

We are grateful to Dr. Saroj Pachauri for providing overall support and guidance to the project. We appreciate Ms. Anvita Dixit for her editorial help in finalizing this volume. The entire coordination of fieldwork of this study and logistics has been ably handled by Mr. V. L. Thomas of the Population Council.

ONE

Overview of the Study

M.E. Khan and Kumudha Aruldas

Introduction

The present report provides findings of a large study which was undertaken to generate comprehensive information on the select eight target behaviors which have direct bearing on the family health in rural Bihar. **The eight selected target behaviors** include:

- Target behavior 1: Increasing the proportion of deliveries that occur in a facility and mothers who have access to basic emergency obstetric care (EmOC).
- Target behavior 2: Increasing the proportion of safe deliveries at home (including a skilled birth attendant, clean delivery, birth preparedness and a care-seeking plan in case of complications and/or emergency).
- Target behavior 3: Increasing the uptake of preventive postnatal care services for newborns and mothers (including clean cord care, immediate breastfeeding and early follow-up of the mother and child).
- Target behavior 4: Increasing the practice of skin-to-skin care (STSC)/Kangaroo Mother Care (KMC) for newborns.
- Target behavior 5: Increasing the practice of early and exclusive breastfeeding of infants during the first six months of life.
- Target behavior 6: Increasing the proportion of children (6-23 months) who receive appropriate complementary feeding (solid or semi-solid food).
- Target behavior 7: Increasing the uptake of postpartum family planning methods, including the Lactational Amenorrhea Method (LAM), to adequately space births.
- Target behavior 8: Increasing the rate of compliance for recommended schedules of child immunization.

The specific objectives of the study were to:

- Assess the present status of each of the behavior targets,
- Identify the key barriers and facilitating factors to the adoption of these health behaviors,
- Suggest how the findings could be utilized for developing a BCC comprehensive strategy.

This study was funded by Bill & Melinda Gates Foundation (BMGF) and is part of generating information on various aspects which could be used for developing a comprehensive communication strategy. Apart from the family health behaviors listed above, other aspects which have also been studied include: Reach of mass media in rural Bihar, interest of media houses in (radio, TV, press) partnering to implement communication strategy, role of information communication technology (ICT); reach of mobile phones in rural areas and how presently it is being used by the health workers and what role mobile technology could play in implementing BCC strategy. An attempt was also made to see what various development partners are doing in Bihar and how their efforts could complement the proposed communication strategy. Finally future demand for maternal and child health care services was projected to assess whether the existing system can meet the demand of services increased because of a comprehensive BCC strategy and various health care imitative undertaken by Government of Bihar (e.g. JSY). Findings of these studies have been given elsewhere (Khan et al., 2012).

Theoretical Framework

The present report gives findings of last part of the total study based on a formative study conducted by interviewing a large number of stakeholders like women, their husbands, mothers-in-law and frontline workers like ASHAs, AWWs and ANMs. The present study is almost a replica of the study undertaken in rural Uttar Pradesh (UP) and the findings are given elsewhere (Khan et al., 2012). The theory of change, Pathways Communication Model, developed under UP study was found to be a useful tool for collecting a comprehensive dataset was also used in Bihar and is given in Appendix 1.

Methodology and Sample Size

To gather comprehensive information on behavioral targets and to develop a BCC strategy/plan, in 2010-11, a formative study was conducted by the Population Council in rural Bihar.

The formative study was conducted in two phases. In the first phase, 317 in-depth interviews were conducted with family members, health care providers and *panchayat* members. Qualitative study was conducted in 24 villages: eight villages each from three selected districts located in three different regions. (Khan et al., 2012) In second phase, a large household survey was conducted covering 2,941 households, 2,937 currently married women age 15-34 years who had delivered a child in three years preceding the survey, 723 husbands, 712 mothers-in-law, 212 accredited social health activists (ASHAs), 243 *anganwadi* workers (AWWs), 137 auxiliary nurse midwives (ANMs), and staff at 90 government health facilities (primary health centers [PHCs] and community health centers [CHCs]) from 150 villages in nine districts spread across the nine administrative division of Bihar.

Apart from this formative study, an independent survey was done during August-September 2010 to assess the reach of mobile phones (ownership and accessibility), whether mobile phones could be used in the health sector especially for disseminating health related information rural Bihar.

Household and Community Level Survey

The objectives of the household and community level study were to assess (a) women and community members' level of correct knowledge and practice of the eight target behaviors, (b) impact of the JSY on increasing institutional deliveries and postnatal care among mothers and newborns, (c) barriers and facilitating factors in adopting desired targeted behaviors, including availing the JSY incentive for institutional deliveries, (d) exposure to mass media, and (e) best media mix for aligning messages to reach targeted audiences.

Qualitative Study

The objectives of the qualitative survey were to generate data and understand the decision-making processes and family dynamics controlling or facilitating adoption of behaviors. Moreover, the aim was to get answers to 'why' certain traditions and practices are followed and to get full stories of case studies. The qualitative enquiry provides an understanding of the (a) multiple factors that shape certain behaviors/practices – e.g. the practice of confinement of the mother/newborn during the postpartum period; bathing the newborn, and giving prelacteal feeds; (b) existing rituals and traditions; their perceived benefits, significance and impact on target behaviors; (c) reasons for the non-acceptance or non-practice of desired behaviors and the family's role in reinforcing traditional practices; (d) key influencers and decision-makers within the family and the immediate environment; (e) benefits and challenges of the JSY scheme and the impact of JSY on community behaviors; (f) why the majority of women leave the health facility soon after delivery; (g) networking among different frontline workers and their functioning; (h) health care providers' perceptions of the benefits of traditional practices; (i) various factors that lead to 'positive deviants' and the sustainability of the process, the role of social capital and self-help groups in the adoption of target behaviors; (j) quality of services provided at health facilities, particularly preventive care services and the provision of information; and (h) accessibility and current use of mobile phones especially in health related issues and its potential role in disseminating health related messages.

Survey Instruments

Questionnaires

For the ***quantitative data collection***, 9 sets of questionnaires were developed: a Household questionnaire, Women's questionnaire, Husband's questionnaire, Mother-in-law's questionnaire, Village questionnaire, ASHA's questionnaire, AWW's questionnaire, ANM's questionnaire and questionnaire for Facility Survey. All the questionnaires were bilingual; with questions in English and Hindi. Beside experience of conducting similar survey in UP, the overall content and format of the questionnaires were developed through a series of meetings and reviewed by experts in the related fields. The data thus generated is quite matching with UP study.

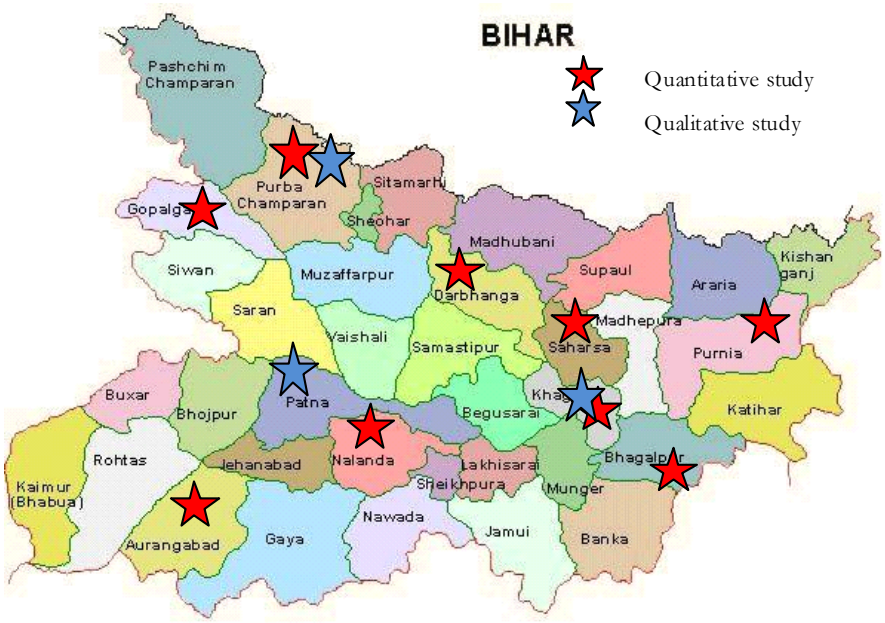
Interview Guidelines

For the ***qualitative phase***, two sets of guidelines were prepared for key informant interviews and case studies. The guidelines were prepared in consultation with experts in qualitative research.

Sample Design and Sample Size

A multi-stage, stratified, probability proportional to size (PPS), systematic sampling procedure was followed for the present study. In the first stage, all the 37 districts of Bihar were ranked and stratified in 9 strata based on certain socio-economic and developmental parameters. Nine districts from each of the nine administrative divisions of Bihar were selected keeping their geographical distribution in mind. As caste and female education have been found to be a critical element in adopting target behaviors, for the purpose of sampling, these two variables were incorporated in the sampling procedure to ensure that all educational and caste groups are properly represented in the sample. In the second stage, villages in each of the selected districts were stratified in two strata on the basis of percent SC/ST population. A cut off of 25 percent was chosen considering the percentage of SC/ST population in rural Bihar. Villages in each stratum were then arranged in alternate orders of female literacy. A total of 150 villages were selected through the PPS sampling procedure. In the last stage, 20 households were selected following systematic random sampling procedure from each of the 150 selected villages. The 2001 census list of districts and villages served as the sampling frame. The study districts are shown in the following figure:

Figure 1.1: Study districts



Source: Adapted from mapsofindia.com.
Note: Map not to scale and does not depict authentic international boundaries.

Before selecting a household, a complete household listing exercise was carried out in the selected villages. For house listing in large villages, the following procedure has been adopted. In case of PSUs with 250 or less households, all the households were mapped. For PSUs with 251-600 households, the PSU was divided into 2 segments and 1 segment was selected randomly. PSUs with more than 600 households were divided into 4 segments (radial) and 2 segments were selected randomly. The boundaries of each study village were drawn to broadly identify the households.

From each household, one currently married woman aged 15-34 years has been selected for interview. In case the household has more than one eligible married woman, the KISH table was used to select one woman from that household for the survey.

Sample Size

The sample size for the quantitative survey was estimated using the standard sample size calculation formula considering at least three ANC as the indicator for calculating sample size, with 95 percent confidence level, 80 percent power and design effect as 2. Apart from the household survey and one eligible woman from the selected households, one-third of husbands and mothers-in-law each were decided to be interviewed. The sample size of the study is shown in the following table.

Table 1.1: Sample size for quantitative and qualitative study, rural Bihar.

Category of respondents	Number interviewed	
	Quantitative study	Qualitative study
Households	2,941	NA
Women	2,937	100[@]
Husbands	723	50[#]
Mothers-in-law	712	47[$]
Staff at PHCs/CHCs	90	NA
ANMs	137	NA
ASHAs	212	36
AWWs	243	41
Panchayat members	NA	20
*Dai*s	NA	23
Total	**7,995**	**317**

Source: Population Council, formative study, 2011.
Note: MIL=mother-in-law; ANM=auxiliary nurse-midwife; ASHA=accredited social health activist; AWW=*anganwadi* worker; PHC=primary health center; CHC=community health center.
NA= not asked.
[@] **includes** 47 home deliveries, 53 institutional deliveries; [#] **includes** 20 home deliveries, 30 institutional deliveries; [$] **includes** 18 home deliveries, 29 institutional deliveries.

Recruitment, Training and Fieldwork

While a survey agency was hired for the quantitative data collection, the qualitative data collection was done by in house by a team of trained research assistant lead by six experienced Population Council professionals. The training of the qualitative data collection was done by the Council professionals and a consultant Bert Pelto, a very experienced medical anthropologist who was also part of the study team.

Training of interviewers for quantitative survey was conducted jointly by the staff of the Population Council and senior level staff of the agency. The duration of quantitative training was of 15 days and the qualitative training was for 7 days. The following steps were taken to ensure quality of data collection:

- Review of all questionnaires by selected experts
- Pre-testing before finalization of questionnaires for relevance of questions, translation and flow
- 100 percent of the filled-in questionnaires was manually checked and 10 percent was back-checked before the field team left the village
- Two staff member from Population Council was with each team to monitor the progress and quality of data collection

Data Analysis

The data entry package was developed in CSPro 4.0 software and reviewed thoroughly by Population Council. The raw data were validated and cleaned to remove possible inconsistencies. Final data cleaning and recoding of the data into a standard structure was done at Population Council.

Data from multiple sources and respondents helps in understanding the context and in the triangulation of the data. The quantitative data analysis was carried out in SPSS package. Univariate, bivariate and multivariate analysis was done to depict the findings and different statistical tests were applied to validate different hypotheses. Atlas-ti package was used for qualitative data analysis.

Institutional Delivery

Chapter 2 presents how *Janani Suraksha Yojana* (JSY) has overcome some of the barriers to institutional delivery. It also provides some insight why despite the incentive money for delivery at institution some families still deliver at home. The paper also identifies some of the facilitating factors to institutional delivery, and suggests programmatic and behavior change communication (BCC) initiatives that could accelerate institutional delivery and increase access to emergency obstetric care (EmOC) to all women in need of the services.

The paper shows that JSY has accelerated adoption of institutional delivery in rural Bihar; the percentage increased three folds between 2005-06 and 2010-11. Currently 54 percent of the

women prefer institutional delivery and gradually it is increasing. Analysis of the average out-of-pocket expenses for a normal delivery at any public facility was estimated around Rs. 1,536 which is slightly more than Rs. 1,400 paid to women under the JSY. The median expense however indicates that in 50 percent of the cases out of pocket expenses were only Rs.1,200 which is Rs.200 less than the JSY incentive money. This clearly has benefited a lot of poor people who because of lack of resources to pay for the expenses of institutional delivery earlier preferred delivery at home. Many of these disadvantaged groups are now availing institutional deliveries and related other services. This is well supported by the fact that since the introduction of JSY, the relative disparity by religion, caste and class has reduced significantly with respect to utilization of various services and adopting selected healthy behaviors. In other words, the equity issue, which was one of the central goals of JSY, is being achieved.

A point of concern as the paper points out is however, lack of readiness of the facilities to provide quality services. According to the findings of facility survey taken as part of the present study shows that only 5 of the 90 public health facilities covered, had all basic emergency obstetric care (BEmOC) services and none were in position to provide comprehensive emergency obstetric care (CEmOC) services. The increasing workload of institutional delivery due to JSY is making the situation further demanding. The situation has aggravated by the government policy that JSY incentive money to woman will be offered only if she delivers at any public health facility. This has led to a drastic shift of women from private hospitals to public clinics; the ratio of public – private delivery has changed from 14:86 in 2005-06 to 79:21 in 2010-11. All these indicate that while institutional deliveries are increasing, unless a simultaneous improvement in infrastructure facilities and trained human resources takes place, current public facilities will not be able to provide quality services to many families and emergency obstetric care will not be available to women in critical condition.

In the second part, the paper tries to identify barriers which despite of the availability of JSY incentive money for institutional delivery, hold four out of 10 families to continue with the old practice of home delivery. At individual and family level, the key barriers identified include: widely held perception that if pregnancy is normal no need to go to an institution for delivery (44 percent), perceived high cost of institutional delivery and non-availability of transport especially at night. The experience of previous practices on place of delivery also has strong bearing on the continuation of the practice. For example, if the previous delivery was at home and without any complications, it reinforces their decision next time to deliver at home. Just in contrast, if the previous delivery was in institution, eight out of 10 families continue to go to institution for next delivery. Further, in rural Bihar, as in most of the Northern India, most of the women lack decision-making power and place of delivery is mostly decided by husbands and mothers-in-law pointing to the fact that family should be the focus for motivational change of their present behavior. Lack of social capital in form of loan facility to meet immediate delivery expenses or absence of other family member's or neighbor's support to the family during the period women is in hospital also contribute to the continued practice of home delivery. This is reflected by a woman's statement:

> When you deliver at home women from neighbor and [dagrin] women who cut cord to come and help us. If there is any difficulty, everyone cooperate and come forward to help, unlike being in a hospital where there are only nurses who most of the time, lock themselves up inside their own room. (SC, illiterate) (Aruldas et al., 2012, p. 80)

Poor perceptions about public facilities and lack of privacy in labor room, and in some cases perceived bad behavior of ANM/nurse were also cited as discouraging factors for not going to public facility for delivery. For example, one woman said:

> At home, delivery happens behind a [purda] curtain; in hospital anyone can see woman during delivery…. sometimes nurses call a male doctor to check women. So, I do not like to go to a hospital. (High caste, illiterate) (Aruldas et al., 2012, p. 80)

An analysis of the health system and functioning of ASHA revealed several limitations which also contribute to limited success of JSY program. For example, analysis shows that delivery preparedness measured in terms of saving money, deciding in advance about institution where they could deliver the child or rush in case of emergency and arrangement of vehicle to shift women while in labor pain, and three or more ANC are critically important determinants of institutional delivery. ASHAs generally fail to educate women and their family members about these important aspects. The situation becomes worse because of social and caste differences between ASHA and families she is supposed to visit. ASHAs do not contact almost half of the families for health promotional activities in their villages. Most of these neglected families are the most disadvantaged population groups who belong to scheduled caste, living in isolated hamlets of the village, or minorities living in clusters. Lack of basic health infrastructure in public health facilities influence postpartum care of women and new born also. Almost half of the women leave clinics within 6 hours after delivery and most within 12 hours.

Multivariate analysis shows that apart from three or more ANC and delivery preparedness, other important factors that influence institutional delivery include: education (women with secondary or higher education, OR=1.62, $p<.01$), parity (first parity, OR=2.06, $p<.01$), religion (Hindu OR=1.84, $p<.01$) and standard of living (belonging to relatively better off families, OR=1.61, $p<.01$). The study also revealed that husband's involvement in maternal care, contact with ASHA and belief among women and family members that delivery in a health facility is safer for both mother and child are other motivating factors for institutional deliveries.

Drawing programmatic implications from the findings, the paper recommend for increasing coverage of families by ASHA and ensuring through supportive supervision by ANM that the disadvantaged groups like scheduled cast and minority families are not neglected in the educational and motivational campaign. As three or more ANC and delivery preparedness appear to be the gateways to change many healthy behaviors including institutional delivery, special effort should be made to promote at least three ANC. The window of opportunities provided during the three ANC visits should be effectively used by ANM to counsel and reinforce messages about delivery preparedness, institutional delivery, and postpartum cares for women and new born such as

examination within three days of delivery, early initiation of breast milk, thermal care and clean cord care, and postpartum contraception. As the study clearly demonstrated that involvement of husband during ANC and husband-wife communication on pregnancy care and future reproductive plan makes big difference in increasing institutional deliveries and adoption of subsequent health behaviors, BCC strategy need to be developed on how to promote husband's involvement during ANC. Present study shows that ASHA, because of some cultural barrier, avoid approaching women's husbands who are important for most family decision including family health behaviors. Similarly, women who had delivered their last child at home constitute an important segment of audience for focused counseling. Alternative modes of communication channels based on local context need to be experimented to reach these segments of audiences.

Increasing Postnatal Care of Mothers and Newborns

The extent to which mother and new born are currently receiving post natal care, a crucial service which could make significant difference in maternal and neo-natal mortality and morbidity is addressed in chapter three. It also identifies barriers and factors facilitating the adoption of healthy postnatal and newborn care practices and the various programmatic and BCC initiatives that could accelerate the adoption of healthy postnatal care practices.

The findings from this study show that only around 26 percent of the mothers and newborn received any checkup in the first seven days of the postnatal period. This percentage has remained unchanged since the DLHS-3 conducted in 2007-08 when the same figure (26 percent) was reported to have received postpartum care within seven days after delivery. This should be a matter of concern for the program managers as according to National Rural Health Mission (NRHM), women and new born should receive past partum check up on the 1st, 3rd, and 7th day after delivery. However, it has remained far from desired level. In 2011 when the present study was conducted as high as 74 percent mother and newborns had not received even one past partum checkup after delivery. Further, during the last four years it has not shown any improvement.

According to the present study the main barriers to postnatal check -up were perception of the family that if the mother and new- born are healthy then there is no need of check-up (69 percent), perceived high cost including the cost of transportation (18 percent), strengthened by the perceived lack of necessity for a routine postnatal check-up (21 percent). A typical response by women is:

> My delivery was normal and there was no problem with me or my baby. So I did not have any checkup anytime after delivery. (SC, illiterate)

Immediate discharge (often within 6 hours) from the facility after delivery primarily due to lack of infrastructure at the facility, concern for family members/children left behind at home and higher/double payment for the transportation, if stayed at facility for 24 hours. The paper gives number of quotes reflecting the reasons for early discharge. The following quote reflects their general feeling.

> The ANM told us that both the mother and baby are fine and hence we could go home…. anyway we cannot stay there for 24 hours even if we want since there are no facilities for any food for the woman or bystanders. There is also no hot water available at the hospital…. (OBC, illiterate) (Aruldas et al., 2012, p. 94)

The study also indicates that in general at the time discharge either no advice for the postpartum checkup is given or they are simply advised that they should get checked up within a week or "*come back if you face any problem"*, reinforcing the perception that postpartum checkup is required only if some problem occurs. The advice given generally does not mention importance of routine postnatal check-up (PNC). The study shows that only 18 percent of those who had at least one antenatal check-up (ANC) and 26 percent of those who had institutional delivery were informed about importance of routine PNC for the health of mother and child. Lack of knowledge of danger signs (both among women and ASHA) is other barriers which delays treatment if problem occurs. Cultural practices such as post natal confinement of mother and newborn for six days was also mentioned by several providers as a significant barrier to routine postnatal check-up within seven days of delivery.

Findings from logistic regression analysis shows that young couples (15-25 year old) with nine or more years of schooling (OR=1.63, $p<.01$) and women and family members who received specific advice on the importance of postnatal checkup (OR=4.83, $p<.01$) were found to have increased likelihood of having received routine PNC. Similarly, those who delivered at a health facility and those who stayed at the facility for 24 hours or more were also found to have a greater likelihood (OR=1.91, $p<.01$) of receiving routine PNC within seven days of delivery. These findings on facilitating factors could be strategically used in segmentation of audiences which need more attention in counseling and strengthening content of postpartum advice to women and family members. With increasing proportion of women delivering at the institution, attempt should be made to hold them for at least 24 hours at the facility. In absence of necessary infrastructure, we do not expect it will happen in immediate future but we must ensure that before discharging the women (which mostly happens between four to eight hours after delivery) a thorough postnatal checkup of women and new born is done and detailed advice to women and her family members for postpartum checkup and its importance is given. Further, ASHA should be provided simple but standardized check-list which she could use during postpartum visit and an instruction that if any of the key danger sign is observed then mother/child should be referred to appropriate health facility immediately.

Cord care: In case of cord care, the study shows that most women and providers believed that something needs to be applied on cord stump to prevent infection and hasten the healing of cord stump. A typical response by women and family members on follow-up cord care is:

> I applied warm mustard oil….nothing will happen even if I do not apply anything. But generally we all apply something on the cord stump…. (OBC, illiterate)

Only 10 percent of women in this study did not apply anything on the cord stump. Gentian violet,

which is an antiseptic liquid, was the commonly applied (75 percent) substance on the cord stump. Moreover, provider's response on advice on care of cord stump showed that 84 percent of 137 ANMs and 33 percent of 212 ASHAs reportedly advised not to apply anything on the cord stump, while 21 and 50 percent of ANMs and ASHAs respectively advised the women specifically to apply gentian violet as seen in the following quote by a woman.

> After cutting the cord, the nurse herself applied the blue medicine on the cord stump.…she advised us also to apply the blue medicine daily to prevent any infection…. (High caste, educated up to class 7)

It is found that women belonging to households with high standard of living index (SLI) were significantly more likely (OR=1.54, $p<.05$) not to apply anything or apply gentian violet on the cord stump compared to those from households with low SLI. Similarly, women who delivered at public facilities (OR=1.53, $p<.01$) or private facilities (OR=2.17, $p<.01$) were more likely to apply gentian violet or not apply anything on the cord stump compared to those delivered at home. Given the fact that gentian violet is an antiseptic solution and being practiced by most of the families in Bihar and also being prescribed by providers (Doctors, ANM, ASHA), the paper argues that any attempt to change this practice and advising not to apply anything will be difficult and may create confusion. Hence the paper recommends that instead of rejecting gentian violet in favor of not applying anything, advice should be given either to apply gentian violet or do nothing. Attempt should also be made to educate how to apply gentian violet in a hygienic manner.

Thermal care: The study, as part of new born care, also investigated thermal care practices. Findings shows that while women, family members and providers are aware of the importance of keeping the new born warm and practice various methods, they all lack understanding of the link between delayed bathing and keeping the newborn warm. For example, only 38 percent of the total women(N=2,937), 50 percent of those who delivered at the institution and 24 percent of those who delivered at home, delayed the first bath for more than 24 hours after birth. Further, only nine percent of the total women interviewed (N=2,937) and 11 percent of mothers-in-law (N=712) have heard of skin-to skin care (STSC) as a method to keep the newborn warm. Nevertheless, as mentioned earlier, all women and providers agreed that newborn needs to be kept warm and about 83 percent of women were practicing different techniques such as wrapping newborn in warm clothes, staying in a heated room and massaging the baby with mustard oil to keep newborn warm. The most common response on thermal care for the newborn by women is as follows:

> It is important to keep newborn warm. Generally we wrap the baby with cotton cloth and then cover with another cloth to keep the baby warm. (High caste, educated up to class 7)

Therefore the communication strategy must address the providers as well as women and her family members about the link between delayed bathing, practicing STSC and keeping newborn warm.

Early and Exclusive Breastfeeding

Early breastfeeding within one hour of birth reduces neonatal mortality rate by 20 percent. Diarrhea and acute respiratory infections, leading causes of infant mortality, have significant association to exclusive breastfeeding. The study shows that early breastfeeding within an hour has increased from about 1 percent in 1992-93 (NFHS-1) to 36 percent in 2010-11 – a 35 percent point increase in 19 years. The initial pace of increase in early breastfeeding was very slow but as the paper shows, after the introduction of JSY and other initiatives taken by Bihar government, it has shown a 32 percent point increase between 2005-06 and 2010-11. The analysis also shows that though there is an improvement in all categories, the relative disparity between Hindus compared others; high SLI against low SLI; general caste and SC/ST and women with secondary education and no education has widened. It indicates that educational campaign have perhaps benefited better off segments of the population more than it has to the disadvantaged groups. No gender disparity in early breastfeeding is seen in rural Bihar. The study also shows that a higher percentage of women from joint family, with secondary education and delivering at a health facility breastfed early compared to their counterparts. A comparison of breastfeeding practice among the women delivered at public clinic as against private hospitals shows that initiation of breast milk within an hour was higher in public clinics than private hospitals.

An important observation of the study which requires immediate improvement at the health facilities is that even in case of institutional delivery only 44 percent women breastfed within one hour and in many cases prelacteal feeding was given when the mother and child were still in the facility. This requires reorientation of ANM/PHN and strengthens supportive supervision at the facility to ensure that the newborn is wiped clean and given to the mother within one hour of delivery and help them to initiate breastfeeding. If required they should educate women and family members that even if breast milk is not coming, suckling by child will expedite secretion of breast milk.

Reasons for delay in breastfeeding, also shared by elder women in the family, include: perception of women and other elder women in family that breast milk does not come immediately after delivery (62 percent), post-delivery cleaning of child took time so delay in breastfeeding (25 percent) and women felt too weak to hold the child and breastfeed after delivery (18 percent). Prelacteal feeding is 59 percent and has an inverse relationship to early breastfeeding.

The study shows that colostrum feeding is now almost a community norm. It has increased from 68 percent in 2007-08 (DLHS-3) to 77 percent in 2010-11 (PC). Few who discarded colostrum were concerned that it could harm the child if fed, because colostrum is thick and child may not able to digest it. If messages focusing on these misconceptions are provide at regular intervals, soon colostrum feeding will be universal and become norm of the society.

An analysis of the data on exclusive breastfeeding shows that only 42 percent of children less than six months of age were exclusively breastfed which is 14 percent more than the corresponding figure (28 percent) observed in NFHS-3(2005-06). Forty seven percent of the children were given

water well before completing six months of age since women thought their child may be thirsty. Introduction of water to children starts quite early, often within two or three months after birth, particularly during summer time. Hardly any woman knew that 80 percent of breast milk is water. If women are made aware of this fact then early introduction of water could be reduced substantially, thereby reducing a serious source of infection to the child leading to diarrhea or dysentery. The study also highlights that about two-thirds (71 percent) of women believed that their breast milk alone would not be adequate to satisfy child's hunger and hence animal milk and or other food should be fed before the age of 6 months. The paper, based on these observations, recommends many messages that could be important for addressing these misconceptions and need to approach women when the child is around four and five months old, when women tend to introduce outside milk/food, to counsel and encourage them to continue with exclusive breastfeeding.

Frontline health workers also had limited knowledge on healthy breastfeeding practices and most of them did not have appropriate counseling aids that address the barriers to breastfeeding. As one of the ASHAs said:

> Breastfeeding should be initiated within one hour after delivery but milk does not come soon therefore women are not able to breastfeed immediately. (SC, educated up to Class 8)

With very low reach of mass media, interpersonal communication by the frontline workers is the best option for reaching the rural women and families with messages on healthy breastfeeding practices. The frontline workers have credibility as knowledgeable women among families and could be effective in promoting exclusive breastfeeding provided their capacities on technical matters and in counseling skills are built.

Complementary Feeding

The critical age in a child's life is 6-23 months as this is the time when under nutrition sets in and stunting set after two years of age is irreversible. Appropriate complementary feeding measured as recommended number of feeds and at least three types of food fed, showed that while around two-thirds (64 percent) of the children aged six months were appropriately fed, only one fourth of the children aged 6-8 months were appropriately fed and thus exposing the remaining three-fourth of the children to under nutrition. These poor and inappropriate feeding practices continued in the next age slab of infancy i.e. children aged 9-12 months where two-thirds (66 percent) were not appropriately fed. Quantity of food fed, as explored in the qualitative study showed that none of the 47 women informant interviewed with children aged 7-12 months were giving the recommended quantity of food. No gender disparity was observed in the practice of appropriate complementary feeding.

The paper provides some good insights on the barriers to appropriate feeding practices of children less than two years. Most common barrier that the paper identifies is women's perception that a

six months old child cannot eat solid/semi-solid food (68 percent). Other reasons for not giving recommended number of feeds by age include: as child is still being breastfed so more food is not required (33 percent); child cannot digest more food (16 percent) and child's stomach will protrude out if fed more (9 percent). The paper recommends that the most important myth that must be addressed is that six months old child cannot eat semi-solid food.

The study also shows that women do not get advice on complementary feeding. Most of the women (87 percent) interviewed reported that no one advised them. Few women (7 percent) were advised by their mothers-in-law. However, their knowledge on complementary feeding was also very limited as one of them said:

> ….there is no fixed time to feed the children, whenever adults at home eat a little quantity is also fed to the child. There is no measure as to how much should be fed to a child, just a little quantity needs to be fed. Even if one spends time to feed food, the child will not eat but if time is spent to feed milk then the child will drink. (OBC, illiterate)

Further, the paper shows that knowledge of husbands about initiation of complementary feeding is equally poor as only 38 percent of them had mentioned that complementary feeding should be initiated at six months of age. However, most of them (75 percent) reported that if they had been aware that complementary feeding should start at completion of six months, they would have told their wives to start feeding food. The study further shows that ASHAs and AWWs, the two key community health workers are totally neglecting their role of educating community about timely and appropriate complementary feedings of children below two years. The finding shows that only few women (4 percent each) had reported receiving advice from AWWs or ASHAs on these aspects.

Multivariate analysis shows that background characteristics of women like religion, caste, standard of living index, type of family, education, children ever born, working status of women outside home etc., did not show any significant difference in appropriate complementary feeding. The logistic regression analysis shows that appropriate complementary feeding was higher among women who received three or more antenatal check-ups as compared to those who did not receive any check-up (OR=1.41, $p<.05$). Number of ANC received is indicative of contact with health providers and therefore increased chances of receiving advice.

Only 30 percent of the AWWs believe that a child aged 6-8 months can eat about 100gms of food. This perception even for older children does not change much and only 58 percent of them believe that a child aged 12-23 months can eat about 100gms of food. Even among ANMs, only 10 percent reported that children aged 6-8 months could eat about 100gms of food. In-depth interviews showed that ASHAs/AWWs did not have any vessel/cup to show fixed measure to explain to women how much food should be given to a child. Building their capacity which is essential for effective communication and counseling efforts provided by them on complementary feedings.

Postpartum Contraception

Chapter 6 explores the current status and trend of postpartum contraception in rural Bihar to identify the barriers and facilitating factors to adoption of contraception and suggests BCC initiatives that could help increase the use of family planning methods particularly in the postpartum period. Among currently non pregnant women aged 15-34, only 31 percent were using any contraceptive method; and the use of modern spacing methods was the lowest, at 6 percent, compared to use of modern permanent methods (18 percent) and traditional methods (7 percent). In the last 18 years, the use of contraception has risen by only 20 percent points; which is around one percent point per year. A national level corresponding increase is estimated to be point per year. Among non-pregnant women with a child less than 6 months, 77 percent were at risk of unwanted pregnancy. These women were neither practicing LAM nor using any other modern family planning method. Among those with a child six months or more, 48 percent were at risk of unwanted pregnancy. Taking the total sample together 51 percent women were at risk of unwanted pregnancy. These statistics are much higher than the unmet need generally calculated in other national surveys, such as DLHS for the state (2007-08).

The study shows that social norms such as desire for large family (at least 3 to 4 children) and son preference (strong desire for 2 to 3 sons) emerged as key barriers for not using any contraceptive method. For instance, analysis shows that the preferred sex composition of children was at least two sons. Moreover, a third of men were ready to accept two additional daughters for a second son. Hence, by the time a couple gets their desired sex composition, often they have a family of four to five children. Voices from women reflect the same:

> I am not using any method since I want more children. I only have two. (SC, illiterate)
>
> I want another child. Once I have a son I will adopt a contraceptive method. (OBC, illiterate with three daughters)

Other important barriers include lack of knowledge of timing of return of fertility, correct knowledge and use of contraceptive methods, fear of side effects and low risk perception of dangers of closely spaced births. For instance, less than 10 percent men, women and ASHAs and AWWs, and 18 percent ANMs reported correctly that a woman's fertility returns after six weeks. As one woman said:

> After delivery a woman can get pregnant only after six months to one year. Till the time the menstrual cycle does not start pregnancy cannot occur. My menstrual cycle starts only after one year so why should I use a method before it returns. (High caste, educated to Class 9) (Aruldas et al., 2012, p. 118)

And a husband reported:

> Only after the menstrual cycle resumes we should use condoms. We don't need it till then. (SC, male educated to Class 7) (Aruldas et al., 2012, p. 119)

The following quotes reflect the common misconceptions regarding modern spacing methods:

> I am scared to use [goli] OCPs because it causes heat in the body…. all those who take it say so. (OBC, educated to Class 12)

While a mother-in-law commented:

> I would not approve of my daughter-in-law using an IUD as it can cause cancer. (OBC, mother-in-law, illiterate) (Aruldas et al., 2012, p. 119)

While a large proportion of women (74 percent) had heard of OCPs, only 30 percent knew how to use them correctly, and even less knew what to do if one pill is missed. Similarly most of the couples using traditional methods (mostly the safe day's method) did not know the correct 'safe days' and practice it wrongly. For instance, 40 percent women did not know which days of the menstrual cycle were safe days; while the rest had incorrect knowledge of which were the safe days. Hence, these women avoid sex on the safe days and have sex during the 'unsafe-days'; which increases chances of pregnancy. As reported by a husband:

> I do not sleep with my wife from the start of the menstrual cycle for 15 days. This is how we have spaced our previous children. (SC husband, educated to Class 5)

Similarly, a woman provided the wrong answer:

> I do not sleep with my husband for the first 5 days of the start of the menstrual cycle. (SC, illiterate)

While most were in favor of three years birth interval, very few actually do anything to prevent unwanted pregnancy. Though there was a general acceptance of birth spacing, knowledge of adverse effects of short inter-pregnancy intervals (within 15 months) such as pregnancy complications, still birth and miscarriage was low- reported by less than 25 percent women and ASHAs. Moreover, access to spacing methods was very limited and could be judged by the fact that less than half of ASHAs had ever been supplied contraceptive method for distribution and less than a fifth of ASHAs had condoms or pills in stock at the time of interview. Very few (30 percent) had counseling aids on birth spacing.

Logistic analysis shows that education of women (OR=1.24, $p<.05$), standard of living (OR= 1.13), spousal communication (OR= 5.70, $p<.01$) and exposure to media and messages on family planning are positively associated with adoption of contraception. The study also indicates that if the woman has been given three or more times advice to adopt postpartum contraception, the couples have adopted a method. One time advice does not make much difference. Thus the study underlines the importance of reinforcing the same messages several times at an interval. The study also recommends improving access to spacing methods through frontline workers, improving knowledge of workers as well as of beneficiaries about family planning methods, providing messages repeatedly to promote contraception, developing messages according to the interest of the audience, and making home visits to promote contraception in the 4^{th}, 6^{th} and 7^{th} months after

delivery, when they are most exposed to unwanted pregnancies. The chapter also recommends that interpersonal communication supported by mass media could play a key role in adoption of birth spacing by increasing correct knowledge on contraception, addressing misconceptions and triggering spousal communication.

Immunization

The last chapter covers immunization status of children aged less than two years in Bihar. The findings of the study shows that 76 percent of children aged between 12-23 months in rural Bihar were fully immunized. The trend analysis shows that over the last five years full immunization coverage has been consistently increasing from a low of 30 percent in 2005-06 to 42 percent in 2007-08, 54 percent in 2009 and then has jumped to 76 percent in 2011. Further analysis of the data by estimating full immunization coverage based on information copied from the immunization card of the child and the other based on mother's reporting showed wide difference; 87percent in the former case while 62 percent in the latter case. The paper argues problems in both the estimated figures; an over estimation in former case due to inflated reporting by the health workers in the card and an under estimation in the latter case because of recall laps of the mother. The paper, after triangulation with other data arrives at an estimate of 67 or 68 percent full immunization which is more realistic yet revealing an impressive improvement in full immunization coverage over time.

The findings indicate that full immunization coverage has improved among all segments of the population across all the region of Bihar. However rate of increase is much faster among marginalized group and the relative disparity has reduced substantially between high caste and schedule caste, high SLI and low SLI, and women with secondary education and no education.

The major factor in uptake of immunization in Bihar is perhaps due to number of coordinated efforts in last four years by the Department of Health and Family Welfare, Department of Women and Child Development and UNICEF. In October 2007, the Government of Bihar introduced a campaign called "*Muskan ek Abhiyan"* (The smile campaign) with an objective of achieving 100 percent routine immunization (RI) coverage of children aged 0-5 years and TT for pregnant women by strengthening the RI delivery system and introducing outreach services that are organized twice a week in an area; one day at *Anganwadi* center and a second day in another part of the village. Under the program micro-plan are prepared by ANM with the support of ASHA and AWW by identifying and listing each family where either a child or woman is eligible for immunization, strong monitoring of timing of immunization sessions, supplies, due list, number of children immunized, quality of services etc. Beside this, health workers are paid incentive based on performance which is big motivating factor for the workers and they take mobilization of children much more seriously, special campaign for measles vaccination to cover the dropout and left outs. As the maximum drop out takes place at the time of measles vaccination, covering them through mopping up has direct bearing on full immunization rate.

Muskan ek Abhiyan has also increased reliability and availability of service through regular observance of fixed immunization days in the community. The coordinator appointed by UNICEF has also strengthen monitoring and supervision mechanism which as paper argues has direct bearing in regularity of supplies and quality of RI over 95 percent of ANM reported they had adequate supplies of all vaccines.

JSY has helped in increasing the number of frontline health workers in each village, which under *Muskan ek Abhiyan* along with AWW are well coordinated in mobilizing community for immunization resulted in increased utilization of immunization services as well as their credibility in the community. As one of the woman said:

> Whenever there is immunization session in the village, ASHA inform all of us and we go immunization. (OBC, illiterate)

Logistic analysis identified several other factors which facilitate full immunization. It include awareness of women about immunization day (OR=1.47, $p<.01$), vaccines required to be given to child (OR=2.56, $p<.01$), awareness of next course of action if child missed a dose (OR=3.01, $p<.01$), advice received from service provides on immunization (OR=1.72, $p<.01$) and institutional delivery (OR=1.88, $p<.01$). All increases the chances of compliance to full immunization.

Although the increasing trend in coverage of full immunization rate in Bihar is encouraging, there are issues which need to be addressed as about one third of children were yet not fully immunized due to various reasons. The most commonly cited reasons for non-compliance to full immunization were lack of knowledge about immunization, fear of side effects or previous experience of side effect of vaccination, sickness of the child on vaccination day. A typical response from a woman reflects the fear of side effects of vaccination as:

> I fear that child will develop pustule and gets fever, then it will be a problem for me. (SC, illiterate) (Aruldas et al., 2012, p. 127)

Lack of support in the family to take the child for vaccination and lack of time as parents go to work or remain busy in household chores are other factors contributing to drop out of children from completing immunization schedule. For example a typical response from a mother-in-law:

> Women do not get time to immunize their child because they even carry their small child with them to the field. (Aruldas et al., 2012, p. 129)

Some of the other reasons for non-compliance to full immunization that need to be addressed at program level include lack of awareness among women about timings of immunization session in the village, lack of communication and counseling skills among frontline health workers to convince women on side effects of vaccination and their management. A typical response from an ASHA:

> I fear of telling people that child can develop fear or pustule after vaccination. (OBC, educated up to class 5,)

Lack of systematic approach of identification of eligible children for vaccination, tracking and follow up of drop outs are major reasons for low coverage for full immunization.

Although, full immunization is increasing rapidly, even among disadvantage groups, the full immunization rate for children from less educated and Muslim groups is lagging behind. Therefore, BCC strategy should focus these population segments and there is need to provide comprehensive information on benefits of full immunization and how to manage side effects. As frontline health workers lack competency based technical and counseling skills they should be trained to make interpersonal communication (IPC) more effective.

TWO

Increasing Institutional Deliveries and Access to Emergency Obstetric Care Services in Rural Bihar

Avishek Hazra, M. E. Khan and Deepthi S. Varma

Background

Provision of appropriate delivery care services and practices are critical for both maternal and neonatal survival and health. Delivery assisted by a skilled person is an important indicator in monitoring progress towards Millennium Development Goal-5 to reduce the maternal mortality ratio by three quarters between 1990 and 2015 (United Nations, 2010). In addition to this, it is important that mothers deliver their babies in an appropriate setting, where life saving equipment and hygienic conditions can also help in reducing risk of complications that may cause death or illness to mother and child (Campbell and Graham, 2006).

Population Council's literature review (Khan et al., 2011) and the landscaping study; Shaping Demand and Practices to Improve Family Health Outcomes (Khan et al., 2012) identified several individual and family factors, as well as health system factors, determining the extent of utilization of various reproductive health service components by women and their families. Multiple factors like women's education, caste (Bhatia and Cleland, 1995; Lim et al., 2010; Navaneetham and Dharmalingam, 2002; Pallikadavath et al., 2004), standard of living index, number of contacts with frontline health workers, accessibility to health services and distance from health facility (Khan et al., 2010; Misra et al., 1998; Navaneetham and Dharmalingam, 2002; Varma et al., 2010), influence decision for place of delivery.

Recognizing the importance of health in economic and social development and improving the quality of life, in 2005, the Government of India launched National Rural Health Mission (NRHM). The main aim is to provide effective healthcare services to rural population throughout the country with special focus on 18 states, which have poor public health indicators and/or weak infrastructure. As part of this endeavor, a conditional cash transfer program *Janani Suraksha Yojana*[1] (JSY) was introduced with the objective of reducing maternal and neonatal mortality by promoting institutional delivery among the poor pregnant women (Box 2.1).

Under the JSY, all pregnant women delivering in Government health facilities or accredited private institutions receive cash assistance Rs. 1,400 in rural areas of low performing states in India. A community-based woman called Accredited Social Health Activist (ASHA) receives Rs. 600 for

accompanying a woman to a health facility and staying there until the woman is discharged. Apart from this Rs. 600 payment, some states offer the ASHA additional payment for undertaking other health related activities. Pregnant women belonging to families under below poverty line (BPL), aged 19 years and above, preferring to deliver at home is entitled to cash assistance of Rs. 500 per delivery up to two live births (MOHFW, 2006). In order to achieve the NRHM objectives, under the JSY, about 855,000 Accredited Social Health Activists (ASHAs), one for every 1000 rural populations, are now appointed in India (MOHFW, 2011).

Box 2.1: Janani Suraksha Yojana

The Janani Suraksha Yojana (JSY) involves:
• Early registration of pregnant women with the help of village level health workers like ASHAs
• Early identification of complicated pregnancy cases
• Providing at least three antenatal check-ups and post- delivery visits
• Organizing appropriate referral and providing referral transport to pregnant mothers
• Convergence with efforts of Integrated Child Development Services (ICDS) workers by involving *anganwadi* workers (AWW) extensively
• All pregnant women delivering in Government health facilities or accredited private institutions receive cash assistance Rs. 1,400 and ASHAs get Rs. 600 in rural areas of low performing states
• BPL pregnant women aged 19 years and above, preferring to deliver at home is entitled to cash assistance of Rs. 500 per delivery up to two live births

Source: MOHFW, 2006.

Objectives

In spite of numerous studies dealing with JSY and its impact, there is dearth of detailed information on various barriers that inhibit institutional delivery even after the 5 years of the JSY scheme and key influencers/facilitating factors within the community for institutional delivery. In 2010-11, the Population Council conducted a formative study in rural Bihar to (a) assess the level of institutional delivery after the introduction of the JSY, (b) understand barriers and facilitating factors to institutional delivery, and (c) identify programmatic and behavior change communication (BCC) initiatives that could accelerate institutional delivery and increased access to emergency obstetric care (EmOC) services.

Methodology

The formative study was conducted in two phases. First, 317 in-depth interviews were conducted with family members, health care providers and *panchayat* members. Qualitative study was

[1] In Bihar, the scheme is termed Janani Evam Bal Suraksha Yojana (JBSY). Therefore, the terms JSY and JBSY have been used interchangeably in this chapter

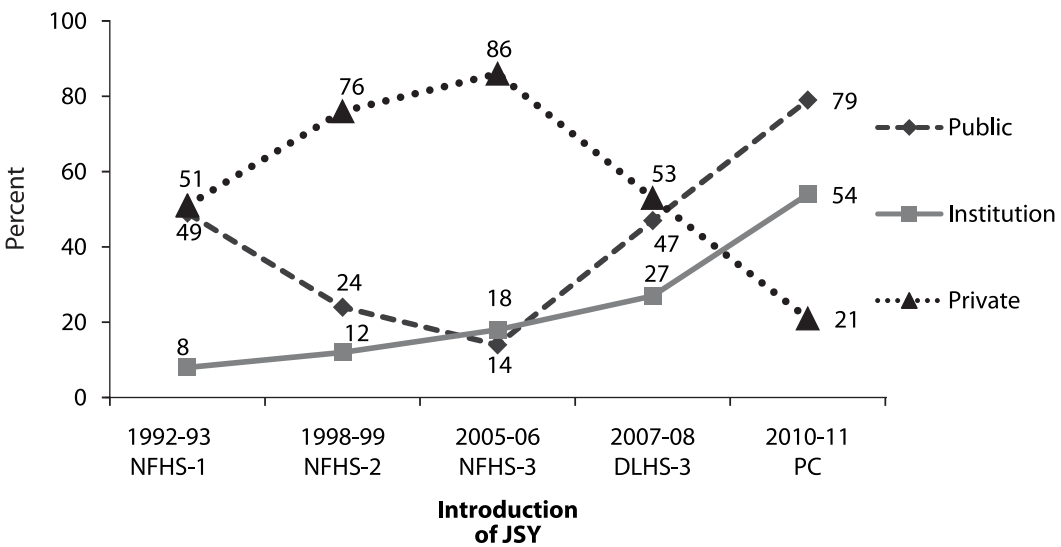
conducted in 24 villages: eight villages each from three selected districts located in three different regions.In second phase, a survey was conducted covering 2,941 households, 2,937 currently married women age 15-34 years who had delivered a child in three years preceding the survey, 723 husbands, 712 mothers-in-law, 212 ASHAs, 243 *anganwadi* workers (AWWs), 137 auxiliary nurse midwives (ANMs), and staff at 90 government health facilities (primary health centers [PHCs] and community health centers [CHCs]) from 150 villages in nine districts spread across the nine administrative division of Bihar. Some of the findings of secondary analysis of National Family Health Survey (NFHS, District Level Household Survey (DLHS, and qualitative findings given in this chapter have been taken from the study published by Sage Publications (Khan et al., 2012). Details of study design and data collection methods have been discussed in the introduction chapter of this book.

Key Findings

Status and Trends

Among the 2,937 women interviewed in rural Bihar, 54 percent (1,578) women delivered their last child in a health facility. The trend of institutional deliveries indicates that in rural Bihar, it has increased from 8 percent in 1992-93[2] to 18 percent in 2005-06, when JSY was introduced; the

Figure 2.1: Institutional delivery and its share in public and private institutions (percent), 1992-2011



Source: Reanalysis of NFHS-1, NFHS-2, NFHS-3, DLHS-3, and Population Council, formative study, 2011.

percentage went up to 27 percent in 2007-08 (Hazra and Khan, 2012), and doubled to 54 percent in 2010-11 (Figure 2.1). Women who went for institutional delivery, majority (43 percent) of them went to public health facilities like PHC, CHC and referral hospitals and 11 percent delivered at private health facilities. However, 46 percent of women still delivered at home (Table 2.1).

Table 2.1: Place of last delivery

Place of last delivery	Total	Percent
Institution	1,578	**53.7**
Public	*1,242*	*42.3*
Private	*336*	*11.4*
Home	1,359	**46.3**
Total	**2,937**	

Source: Population Council, formative study, 2011.

Figure 2.1 further shows that the public-private share of deliveries was 14:86 in 2005-06 when JSY was introduced. In 2011, the situation is reversed and the public-private share is now 79:21; which is mainly due to the JBSY. While this is encouraging, considering poor infrastructure and limited human resources in public health facilities, such a steep increase in workload without corresponding improvement in infrastructure and human resources, could place major constraints on a few better functioning facilities, thereby leading to decline in quality of intra-partum as well as postpartum services (Hazra and Khan, 2012). Analysis of future demand for delivery services in Bihar shows, unless infrastructure and human resources are significantly improved, current public facilities will not be able to provide quality services for more than 60 to 65 percent of deliveries (Ram, 2012).

Disparity in Institutional Delivery by Religion, Caste and Class

Table 2.2 shows the change in disparity by religion, caste and class over a period of five years, since JSY was introduced. It is clearly visible that although disparity in institutional delivery between Hindu and others, high caste and scheduled caste (SC)/scheduled tribe (ST), women from households with high standard of living index (SLI) and low SLI, and women with secondary education and no education still persists, disparity in all these socio-economic groups has been reduced drastically over time.

[2] Unless otherwise indicated, data from NFHS-1, NFHS-2, NFHS-3, and DLHS-3 presented in this chapter are based on an analysis, conducted by the Population Council, of currently married women aged 15-34 in rural Bihar who had given birth in the three years preceding the survey.

Table 2.2: Relative disparity by religion, caste and class (percent)

Categories	Relative disparity	
	2005-06	2010-11
Hindu vs. Others	60.3	31.0
General caste vs. SC/ST	58.7	2.9
High SLI vs. Low SLI	78.5	31.2
Secondary vs. No education	74.8	33.1

Source: Reanalysis of NFHS-3 and Population Council, formative study, 2011.

For example, in 2005-06, Hindu women were going relatively more (60 percent) for institutional delivery compared to women from other religion (Table 2.2). The relative disparity had become just half (30 percent) in 2010-11. Similarly, the relative disparity among general caste women was 59 percent in 2005-06, which has been reduced to 3 percent in 2010-11. Similar findings are observed for SLI and education groups also. That means, over the years, women from disadvantaged group, who are from other religion, SC/ST, from poor families and uneducated, have taken the benefit of the JBSY to a larger extent than their counterparts. Therefore, it may be said that the equity issue, which was one of the central goals of JSY, is being well addressed by the scheme.

Readiness of the Public Health Facilities

The infrastructural condition, trained and sufficient human resources and availability of drugs and essential facilities are key elements of ensuring a delivery to be safe. Extant literature shows the absence of skilled personnel to attend the delivery in times of need (McCaw-Binns, 2003; Matthews et al., 2005; Sreeramareddy et al., 2006), and the lack of adequately equipped and staffed facilities, especially in terms of EmOC services (Barua et al., 2003; IIPS, 2006; Koblinsky et al., 2006) are some key reasons that deter women and their families from going to a health facility for delivery.

In the present study, information collected from 90 public health facilities in rural Bihar, indicates that while majority (90 percent) of the facilities had a standby generator, a functional delivery table or OT table; only 29 percent of the facilities had at least one staff trained in managing EmOC; and 20-40 percent of the facilities had equipment for assisted vacuum delivery or forceps delivery, normal delivery kit and essential obstetric care drugs. Overall, only 5 of the 90 public facilities had all these basic components of providing EmOC services.

Key Decision-Makers for Place of Delivery

Literature suggests that family members, particularly husbands and mothers-in-law, play an important role in promoting institutional delivery and the adoption of healthy maternal and newborn care practices (CARE-India, 2008; Singh et al., 1998; Sinha, 2008). Mothers-in-law exert a strong influence

on household decisions as well as their daughter-in-law's care-seeking practices, particularly with regard to maternal and child health (Stephenson and Tsui, 2002).

The question on '*who took the decision on place of delivery'* was asked to all women as well as their husbands and mothers-in-law separately. Twenty two percent of women, 43 percent of husbands and 47 percent of mothers-in-law reported that they took the final decision on place of delivery. Table 2.3 shows that in rural Bihar, decision about place of delivery was mostly taken by the husbands or elder family members in consultation with women. For example, 68 percent women reported that elders in the family discussed with them whether they will deliver at home or at a health facility.

Table 2.3: Role in decision making for deciding place of delivery as reported by women, husband and mother-in-law (percent)

Decision maker for place of delivery	Women	Husbands	Mothers-in-law
Respondent made the final decision	21.9	42.7	46.5
Discussed with respondent but decision was taken by elders/other members	68.4*	39.7	—
This was decision of wife	—	6.8	14.9
This was decision of husband	NA	—	32.0
Respondent had no role in this decision	9.8	10.0	NA
Others (Parents in law decided)	0.0	0.7	6.6
Total	**2,937**	**723**	**712**

NA=Not available
***Source*:** Population Council, formative study, 2011.
Note: *Includes decision of husband.

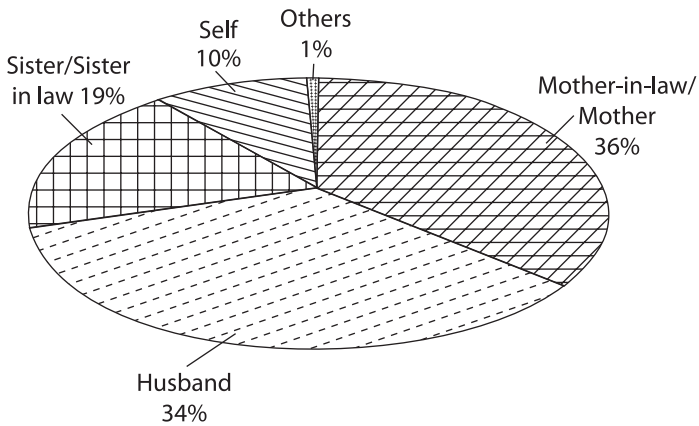
Among women who delivered at any health facility (N=1,578), 10 percent took the decision on their own, husband and mother/mother-in-law took the decision in one third of the cases each (Figure 2.2). As one woman said:

> During my last delivery ASHA told me to go to public facility so that we will get money. My husband was not ready to take me there as he felt there is no necessity since my pregnancy was normal. I argued and told that in the facility I will get injection to increase the labor pain and delivery will be faster than at home. Finally we went to the PHC. (SC, illiterate)

Another woman explained the discussion as follows:

> It was night when my labor pain started. My mother-in-law and father-in-law were talking in the other room. I called my mother-in-law and informed about my pain. She told my father-in-law and both decided to take me to hospital since I had complication in my previous pregnancy and had a still birth. (OBC, illiterate)

Figure 2.2: Key decision maker for institutional delivery

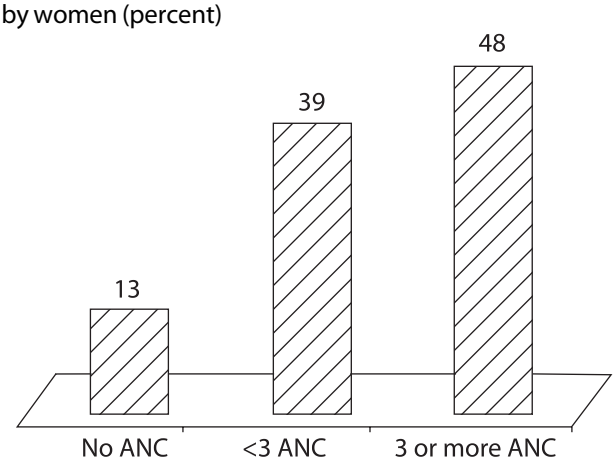


Source: Population Council, formative study, 2011.

Uptake of Antenatal Care Services

Care during pregnancy and antenatal checkups (ANC) are essential for a safe delivery. A Population Council study in Uttar Pradesh revealed that a minimum of three ANC visits is a gateway to behavior change for a cluster of family health behaviors (Khan et al. 2010). The present study shows that in 2011, in rural Bihar, 48 percent of women received three or more antenatal checkups (Figure 2.3), as compared to 27 percent in 2007-08 (DLHS-3).

Figure 2.3: Number of ANC visits by women (percent)



Source: Population Council, formative study, 2011.

While at least one ANC visit was made by most (87 percent) women, half of them did not make three ANC visits because they believed "*pregnancy was normal*" and hence no checkup was required (Table 2.4). Elders in the family like mothers-in-law also had this belief and were not supportive of their daughters-in-law going for a checkup, "*after all it costs money.*"

Very few (6 percent) women received full ANC including examination of abdomen and blood pressure measurement, blood and urine tests, two doses of TT injections and 100 IFA tablets. The findings clearly indicate that ANC was considered equivalent to two doses of TT injections. Although, more than 80 percent of women were making two or three ANC visits, except uptake of at least two TT injections, other components of checkup like blood test, urine test, abdominal examination and measure of blood pressure were not happening.

Table 2.4: Reasons for NO or less than three ANC during last delivery as reported by women (percent)

Reasons	No ANC visit	<3 ANC visit
Pregnancy was normal	53.1	53.5
Elders in family do not support	14.4	10.1
Did not get time for ANC	4.9	7.4
No one was to accompany	11.7	9.4
Do not know where to go	14.1	2.9
Facility too far	11.9	5.5
No transportation	7.3	3.2
Costs too much	26.0	17.9
Total	**374**	**1,154**

***Source*:** Population Council, formative study, 2011.
Note: Percentages may not add to 100 due to multiple responses.

Level of knowledge about number of ANC a woman should receive during pregnancy is almost similar among different family members. About 50-60 percent of women, husbands and mothers-in-law reported that a woman should receive at least three ANC by ANM/doctor either at home or at any health facility (Table 2.5). Analysis further shows that level of knowledge about number of ANC visit should be made has significant association with uptake of ANC services (χ^2 test, $p<.01$). Among women who perceived 1-2 ANC was sufficient, only 20 percent of them received at least three ANC, while women, who believed three or more ANC was required, 65 percent of them went for three or more ANC. The difference in these two proportions are statistically significant (z test, $p<.01$).

Table 2.5: Knowledge about number of antenatal checkup a woman should receive as reported by women, husbands and mothers-in-law (percent)

Knowledge about number of ANC required	Women	Husbands	Mothers-in-law
No ANC	3.5	5.0	7.8
<3 ANC	19.4	18.5	17.4
3 or more ANC	52.1	62.6	50.1
Don't Know/As per need	25.0	13.9	24.7
Total	**2,937**	**723**	**712**

Source: Population Council, formative study, 2011.

Delivery Preparedness

Delivery preparedness, especially saving money for meeting immediate delivery expenses, advance arrangement of transport and identification of health facility to rush to in case of any complications is essential to ensure a safe delivery and aids to avoid sudden unfortunate circumstances. The results presented in Table 2.6 show that delivery preparedness was far from satisfactory; 55 percent women and 58 percent husbands reported that at least one delivery preparation was done before the delivery of their last child. Bivariate analysis indicate a significant association between delivery preparedness and place of delivery (χ^2 test, $p<.01$). About 60 percent of women, out of those

Table 2.6: Types of delivery preparedness made for last delivery as reported by women, husbands and mothers-in-law (percent)

Delivery preparedness	Women	Husbands	Mothers-in-law[#]
Did any delivery preparedness	**55.4**	**57.7**	**75.6**
Decided on place of delivery	39.3	34.8	45.7
Fixed and informed SBA to assist in home delivery	24.8	25.0	7.4
Saved/arranged money for delivery expenses/ in emergency	31.3	56.5	49.6
Arranged transportation to reach facility in emergency	18.1	41.0	14.1
Identified institution where one could rush in emergency	13.9	7.8	2.0
Average number of delivery preparedness done (mean)	1	1	1
Total	**2,937**	**723**	**712**

Source: Population Council, formative study, 2011.
***Note*:** Percentages are based on spontaneous responses only.
[#] Apart from the given percentages, 15 percent mothers-in-law reported 'prepared room for delivery at home' and 64 percent told 'kept ready clean cloth to dry and wrap the baby'.

who did any of the above mentioned three key delivery preparedness, went for institutional delivery, while it is only 46 percent among those who did not do any of these three delivery preparedness (z test, $p<.01$).

Among women who delivered in an institution, 44 percent had decided on place of delivery, 38 percent saved/arranged money, 26 percent made arrangements for transport, and 20 percent identified the institution to rush to in emergency. Among women who delivered at home, these preparations were abysmally low, ranging from 7-34 percent.

Cost of Delivery and JSY Incentive

In the case of normal deliveries at public facilities, average out-of-pocket expenditure was Rs. 1,536 (median Rs. 1,200), which is slightly more than Rs. 1,400 paid to women under JSY (Table 2.7). The average cost for delivery at a private facility was twice for normal deliveries and thrice for caesarean deliveries. The difference becomes still wider when payment of Rs. 1,400 for delivering at public facilities is considered. Further analysis shows that 61 percent of women had spent less than Rs. 1,400; however, another 39 percent had to spend more than Rs. 1,400 for a normal delivery at public health facilities. The average cost of a home delivery was Rs. 504.

Table 2.7. Cost of delivery (in Rs.) according to place and type of delivery

	Public facility		Private facility	
	Mean	Median	Mean	Median
Normal Delivery	1,536	1,200	3,997	3,250
Assisted/ Caesarean	2,896	1,550	9,767	8,825
Total	**1,624**	**1,200**	**6,126**	**4,256**

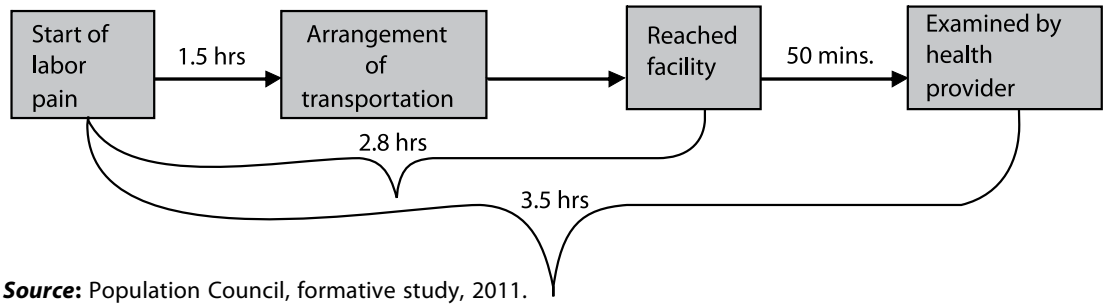
***Source*:** Population Council, formative study, 2011.

Most women (91 percent), who delivered in a health facility, reported that they received the full amount of Rs. 1400 as incentive under the JBSY. However, timing of receiving payment differed; 18 percent received at the time of discharge or within one week, 27 percent received within a month and the rest 55 percent received after a month of delivery.

Time Taken to Receive Care during Delivery

From the start of labor pain, on average, women took about three hours to reach a health facility and another half an hour before being examined by a healthcare provider (Figure 2.4). Delays of more than two hours in shifting to a health facility were because they were expecting to deliver at home (47 percent) and it took time to arrange transport (38 percent).

Figure 2.4: Time taken to receive care during delivery



***Source*:** Population Council, formative study, 2011.

Among women who delivered at home, 15 percent reported that total time from start of labor pain to delivery was more than 12 hours. This group who suffered from prolonged labor is certainly a high risk group in terms of maternal deaths. These women were mostly illiterate (79 percent), from households with low standard of living index (47 percent), with three or more children (54 percent) and never contacted by any ASHA (53 percent).

Injection before Delivery

Two-thirds of women were given at least one injection to increase labor pain and hasten the delivery. Eight in every 10 women who delivered at a health facility and five in every 10 women who delivered at home received the injection. In the case of home deliveries, injections were mostly (89 percent) given by village doctors who were unqualified or semi-qualified private practitioners commonly known as *jholajhap* doctors. However, these village doctors did not stay during delivery or conduct delivery. Mainly *Dai* (75 percent) conducted the home deliveries and 6 percent were assisted by ASHA or ANM.

Barriers

Two-thirds of women and mothers-in-law believed that delivery at an institution is better and safer, while the remaining one-third felt that home is safer, better and more convenient. Despite introduction of JBSY, only half of the women delivered at institution. The study identified many barriers (Box 2.2) to institutional delivery, described as follows.

Box 2.2: Barriers of institutional delivery

- Perception that normal pregnancies do not require institutional delivery
- Previous deliveries at home
- Lack of advice on delivery preparedness
- Non-availability of transport at night
- Lack of social support
- Poor perceptions about public facilities and services offered
- Perceived high cost of institutional delivery
- Lack of interaction between ASHA and other family members.

Source: Population Council, formative study, 2011.

Perception that Normal Pregnancies do not Require Institutional Delivery

Though majority of women felt that institutional delivery is safer both for mother and new born, yet many believed that if pregnancy is normal, no need to go for institutional delivery. A large proportion (44 percent) of women who had a home delivery and 59 percent of mothers-in-law, whose daughters-in-law had home delivery, mentioned *"pregnancy was normal"* as one of the prime reasons for deciding to deliver at home (Table 2.8).

Table 2.8: Reasons for home delivery as reported by women, husbands and mothers-in-law

Reasons for home delivery	Women	Husbands	Mothers-in-law
Pregnancy was normal	43.5	35.4	58.5
Pain started at night, no option	22.7	12.5	27.7
Could not arrange transportation on time	15.8	26.6	18.3
Elder's decision	22.1	12.5	28.0
Did not go for previous delivery also	16.9	22.3	19.0
Institutional delivery costs too much	13.8	18.0	18.7
No health facility nearby	12.2	15.1	16.6
Did not have required money	11.2	24.9	13.5
No one at home to look after children	9.5	2.3	8.7
Total	**1,359**	**305**	**289**

Source: Population Council, formative study, 2011.
Note: Percent may not add to 100 due to multiple responses.

Previous Deliveries at Home

Another major hindrance of institutional delivery is previous delivery at home. If the previous delivery was at home without any complications, it further reinforces their decision next time to deliver at home. Among women whose previous to last delivery was at home (N=1,533), 63 percent (972) still preferred to deliver at home in spite of JBSY (Table 2.9). The similar picture is

Table 2.9: Influence of place of previous delivery on place of last delivery, women (percent)

Previous delivery*	Last delivery		
	Home	Institution	No. of women
Home	63.4	36.6	1,533
Institution	23.1	76.9	770

Source: Population Council, formative study, 2011.
Note: Among women with two or more children (N=2,303);
*χ^2 test, $p<.01$

also for institution delivery. If their previous delivery was at institution, they preferred to go to institution for next delivery also. Further analysis of these 972 women shows majority of them were although aware of JBSY (90 percent), did not meet ASHA (56 percent), belonged to OBC (62 percent) or SC/ST (26 percent), from families with low or medium SLI (90 percent) and illiterate (78 percent).

One such woman said:

> All my children were born at home. I never had any difficulty during any of my previous deliveries. Hence I decided that I will have this delivery also at home. (SC, educated up to Class 10) (Aruldas et al., 2012, p. 82)

Lack of Advice on Delivery Preparedness

As mentioned earlier, the key delivery preparedness such as deciding on place of delivery, saving money for meeting immediate delivery expenses, advance arrangement of transport and identification of health facility to rush to in case of complication is generally not done.

Only one-third of women were advised about delivery preparedness and less than 5 percent were told about all these aspects by ASHA. There is a significant association between advice given on delivery preparedness and actually done any key delivery preparedness (χ^2 test, $p<.01$). About 58 percent of those women, who received advice from ASHA on need for identifying a health facility for delivery, actually identified a facility as compared to 38 percent of those who did not receive any advice (z test, $p<.01$). Similarly, among women who received advice on making advance transport arrangement, 63 percent of those actually did so, while of those who did not receive such advice, only 17 percent made any advance transport arrangement. This clearly indicates, if proper advice is given to families on importance of key delivery preparedness, they are more likely to follow them (z test, $p<.01$).

Non-Availability of Transport at Night

Among women, who delivered at home, about one-fourth reported that pain started at night and there was no transport available to rush to any facility. In the qualitative study, among 47 women who delivered at home, 14 reported they had planned to deliver in hospital but could not do so, because pain started at night and money as well as transport could not be arranged. A woman said:

> I would have gone to hospital if it was day time because I knew that I would get money there. We did not reserve the vehicle earlier since it would have cost us more money and we are poor people. My pain started at night, and we could not arrange transportation at that time. Hence I decided to deliver at home. (SC, illiterate)

A husband from a moderately developed village reported:

> My wife started having pain at night. I immediately went to get a tempo, but the driver was not willing to come since the road to the hospital was bad. Then I decided to take her to the hospital on a cot. I

> went around arranging for men to lift the cot, by that time she had delivered twins. (SC, educated up to Class 5)

Advance arrangement of transport is often difficult as they ask for considerably more money. Hence, most look for a vehicle only after labor pain starts and that makes it difficult to get transport in time. Lack of transport and difficulty in arranging transport are more critical barriers in remote and flood-prone villages than in better connected villages. A woman narrated her experience as:

> My labor pain started at midnight …. Because of floods my father-in-law went to arrange a canoe to take me to hospital …. It took him two hours to arrange. We got down from canoe nearer the hospital, and walked the rest of the way. (SC, illiterate) (Aruldas et al., 2012, p. 81)

Inability to arrange transport on time was reported by 27 percent of husbands and 18 percent of mothers-in-law as one of the main reasons for home delivery. Even among women who delivered at the hospital, 36 percent mentioned arranging transport took two to seven hours.

From a remote village, a woman who had to change transportation twice before reaching to the facility described her journey as:

> ….half an hour after starting mild labor pain I decided to go to the hospital. I told my husband and we went halfway to the hospital on his cycle. We reached the road and waited for my mother-in-law who came walking. From there we hired a vehicle and all of us went to the hospital together.… (OBC, illiterate) (Aruldas et al., 2012, p. 81)

Lack of Social Support

Lack of social support also came out as an important barrier for institutional delivery. One-tenth of women reported either of the responses 'did not have required money' and 'no one at home to look after children' as one of the prime reasons for home delivery.

In the qualitative study, 14 out of 47 women with home delivery, four out of 18 mothers-in-law, and two out of 20 husbands deciding on home delivery reported lack of social support, including supervision of children at home, or unavailability of husband or other male members at home as barriers to institutional delivery. These reasons were compounded by the fact, while delivering at home, the family could avail themselves of support of neighbors and other relatives close by in the same village. A typical quote uttered by a woman:

> When you deliver at home, there are neighborhood women and [dagrin] women who cut cord to come and help us. If there is any difficulty, everyone will cooperate and come forward to help, unlike being in a hospital where there are only nurses who most of the time, lock themselves up inside their own room…. (SC, illiterate, residing in moderately developed village) (Aruldas et al., 2012, p. 80)

Poor Perceptions about Public Facilities and Services Offered

Perceptions about public health facilities, particularly about quality, lack of privacy, bad behavior of providers and cost involved in getting services, were some deterrent factors in availing institutional delivery mentioned during in-depth interviews. These factors were also pointed out by some researchers (Griffiths and Stephenson, 2001; Kowalewski et al., 2000) as de-motivating factors to institutional delivery. In the qualitative study, 13 of 47 women in rural Bihar reported some or all of these problems which are reflected in the following quotes.

A woman said:

> Women who had gone to hospital told me that [memins] nurses insert their hand in the vagina repeatedly to check delivery status …. I did not like it and it scared me to go to a hospital for delivery. (High caste, educated up to Class 2)

Women's reservation on the presence of male doctor during delivery appears from a woman's statement:

> At home, delivery happens behind a [purda] curtain; in hospital anyone can see the woman during delivery…. Sometimes nurses call a male doctor to check women. So, I do not like to go to a hospital. (High caste, illiterate) (Aruldas et al., 2012, p. 80)

Sixty-two percent of women were not ready to be examined by a male doctor even in the case of complication, but the facility survey shows that 81 percent of PHCs and 46 percent of CHCs had no lady doctors.

Perceived High Cost of Institutional Delivery

The literature identified high cost of services as a key barrier to institutional delivery (Chakraborty et al., 2003; Griffiths and Stephenson, 2001; IIPS and Macro International, 2008). This is found to be true in this study also. In Bihar, about 14-19 percent of family members (women, husbands and mothers-in-law) reported high institutional delivery costs as one of the prime reasons for deciding delivery to happen at home (Table 2.6).

In the qualitative study, 12 of 47 women reported high cost as deterrent for institutional delivery. Eleven of these women belonged to either SC or OBC, and were illiterate. Six husbands and mothers-in-law each also mentioned high cost of hospital delivery as an important barrier. Expenses reported included cost of transportation to and fro hospital, cost of medicines, injections, syringes and sometimes gloves for nurses to conduct delivery, tips to facility staff, and other miscellaneous expenses such as food and tea for the woman, as well as bystanders. Inability to meet these costs mainly arises because most families are poor and do not have cash to pay upfront for expenses. One woman said:

> There are no benefits in going to the hospital. We have to buy and provide medicines and even gloves to the nurse for check-up and syringe for the injection…. (SC, illiterate) (Aruldas et al., 2012, p. 81)

Corroborating reports of women and family members, several ASHAs (11 out of 36) also mentioned perceived high cost of institutional delivery as main reasons for families choosing home deliveries.

As reported in Aruldas et al., 2012, p. 81, an ASHA told:

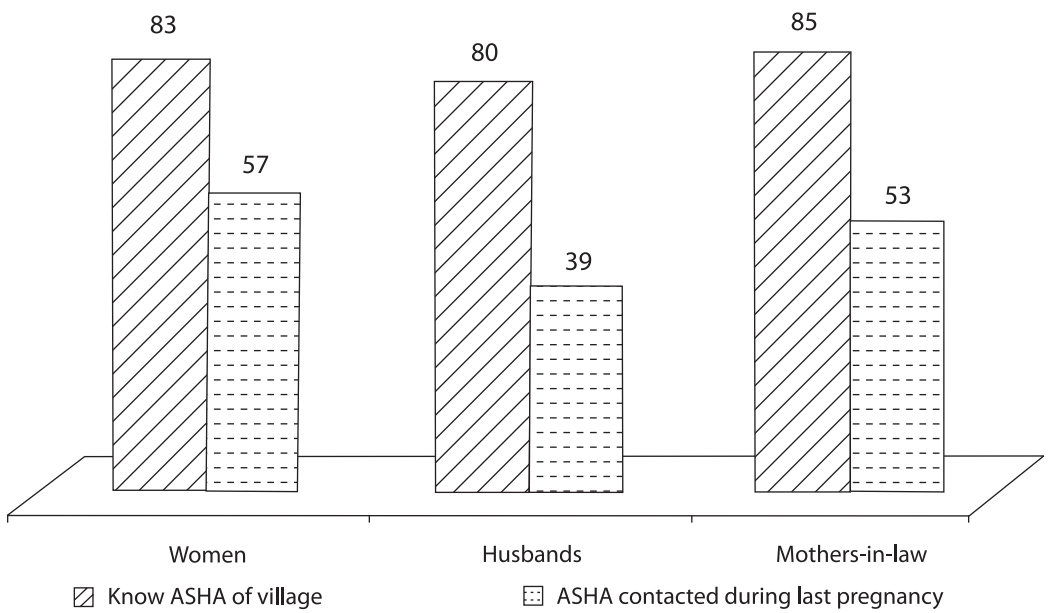
> The main reason for not going to hospital is poverty. It costs a minimum of Rs. 500 to go to the hospital in a vehicle. That is the main reason why women deliver at home even after making them understand the importance of delivering in the hospital. (High caste, educated up to Class 10)

Lack of Interaction between ASHA and Other Family Members

More than 80 percent family members were aware of the ASHA, but only 50-60 percent of them had met the ASHA at least once during last pregnancy (Figure 2.5). In general, content of counseling and topics discussed were few and very superficial. At the time of survey most ASHAs had not received required training.

Merely 57 percent of women met ASHA at least once during their last pregnancy and only 30 percent met within 1-3 months. Of the women who met ASHA at least once anytime during last pregnancy, 48 percent had received advice that they must undergo at least three ANC and 33 percent had received

Figure 2.5: Knowledge about and contact with ASHA as reported by women, husbands and mothers-in-law (percent)



Source: Population Council, formative study, 2011.

advice on importance of rest and proper care during pregnancy. On an average, a woman received three advices from ASHA. Among the mothers-in-laws, who met ASHA (53 percent), only one-third received advice that their daughter-in-laws should make minimum three ANC visit.

Facilitating Factors

Demographic and Socio-Economic Characteristics of Women

Demographic characteristics of women and socio-economic condition of family influence place of delivery (Box 2.3). As seen from Table 2.10, significantly higher proportion of women with secondary or higher education, first parity women, belonging to Hindu, from joint families and households with high SLI, delivered their last child at any health facility, as compared to their corresponding counterparts (χ^2 test, $p<.01$).

Box: 2.3 Facilitating factors for institutional delivery

- Demographic and socio-economic characteristics
- Perception of safety
- Number of antenatal checkups - at least three ANC
- Husband's involvement in MCH care
- Contact with ASHA
- Distance to nearest health facility
- Level of village development

Source: Population Council, formative study, 2011.

Table 2.10 : Place of last delivery by selected individual, family, community and program level characteristics

		Place of last delivery		Number of women
		Home	Institution	
Religion**	Hindu	43.2	56.8	2,427
	Non-Hindu	60.8	39.2	510
Caste	SC/ST	46.5	53.5	716
	OBC	46.5	53.5	1,816
	General caste	44.9	55.1	405
Standard of Living Index**	Low	52.3	47.7	1,088
	Medium	47.0	53.0	1,364
	High	30.7	69.3	485
Family type**	Nuclear	52.5	47.5	1,406
	Joint	40.6	59.4	1,531
Age of women**	15-24	29.5	70.5	129
	25-29	40.9	59.1	1,134
	30-34	47.9	52.1	1,078
Parity of women**	1	33.0	67.0	634
	2-3	45.0	55.0	1,327
	4 and above	56.7	43.3	976
Education of women**	No education	52.2	47.8	1,952
	Primary	43.8	56.2	388
	Secondary/Higher	28.6	71.4	597
Husband lives	At home	45.2	54.8	2,028
	Elsewhere	48.6	51.4	909
Number of antenatal check-ups**	No check-up	68.2	31.8	374
	<3 check-ups	50.5	49.5	1,154
	e"3 check-ups	37.0	63.0	1,409
Contact with ASHA during last pregnancy**	0	58.5	41.5	1,270
	1-2	38.4	61.6	787
	3 or more	35.7	64.3	880
Advice received for institutional delivery**	No	55.4	44.6	1,476
	Yes	37.1	62.9	1,461
Did any delivery preparedness**	No	52.9	47.1	1,311
	Yes	41.0	59.0	1,626
Exposure to mass media**	No	47.6	52.4	2,520
	Yes	38.1	61.9	417
Distance to nearest PHC/ BPHC/24x7 PHC/CHC**	Within Village	38.0	62.0	271
	1-5 KM	39.6	60.4	1,024
	6-10 KM	50.0	50.0	1,210
	>10 KM	56.9	43.1	432
Village size	<1000	44.9	55.1	176
	1001-3000	42.8	57.2	919
	3001-5000	44.3	55.7	551
	>5000	49.8	50.2	1,291
Presence of all-weather road in village**	<1 KM	38.7	61.3	877
	1-2 KM	43.6	56.4	847
	3 KM or more	53.7	46.3	1,213
Total		**1,359**	**1,578**	**2,937**

***Source*:** Population Council, formative study, 2011.
Note: Chi-square test, ** $p<.01$.

Logistic regression shows that chances of institutional delivery are two times more if women are secondary or higher educated (OR=1.62, $p<.01$), of first parity (OR=2.06, $p<.01$), Hindu (OR=1.84, $p<.01$) and belong to economically well-off families (OR=1.61, $p<.01$) compared to their counterparts (Table 2.11).

Table 2.11. Results from logistic regression on predictors of institutional delivery

		Odds Ratio	
		Model 1	Model 2
Religion	Non-Hindu®	—	—
	Hindu	1.94	1.84**
Family type	Nuclear®	—	—
	Joint	1.29**	1.25*
Standard of Living Index	Low®	—	—
	Medium	1.00	1.03
	High	1.39*	1.61**
Parity of women	4 and above®	—	—
	2-3	1.23*	1.28**
	1	1.81**	2.06**
Education of women	No education®	—	—
	Primary	1.20	1.17
	Secondary/Higher	1.52**	1.62**
Husband lives	Elsewhere®	—	—
	At home	1.15	1.11
Number of antenatal check-ups	No check-up®	—	
	<3 check-ups	1.74**	
	e"3 check-ups	2.24**	
Contact with ASHA during last pregnancy	0®		—
	1-2		2.15**
	3 or more		2.31**
Advice received for institutional delivery	No®		—
	Yes		1.34**
Did any delivery preparedness	No®	—	—
	Yes	1.46**	1.33
Husband accompanied during ANC visit	No®	—	—
	Yes	1.50**	1.67**
Had role in deciding place of delivery	No®	—	—
	Yes	1.44**	1.38*
Exposure to mass media	No®	—	—
	Yes	0.92	0.95
Distance to nearest PHC/ BPHC/24x7 PHC/CHC	>10 KM®	—	—
	6-10 KM	1.51**	1.57**
	Within Village/5KM	2.03**	2.04**
Presence of all-weather road in village	3 KM or more®	—	—
	1-2 KM	1.32**	1.19**
	<1 KM	1.59**	1.45**
-2 log likelihood		**3635.07**	**3543.33**
Nagelkerke R square		**0.178**	**0.214**
Total		**2,937**	**2,937**

Source: Population Council, formative study, 2011. ***Note:*** Dependent variable: Institutional delivery (Yes=1, No=0); ® Reference category; *$p<.05$, **$p<.01$

Perception of Safety at Health Facility

The perception of safety for mother and child at health facility was found to be driving force for institutional delivery. About two-third of women who had an institutional delivery mentioned that an 'institutional delivery is safer for mother and child'. The qualitative study shows among 53 women who delivered in a health facility, 40 decided to go to hospital because they perceived it as safer for delivery than home due to the presence of doctors and nurses, and availability of injections and medicines in case of an emergency. As reported in Aruldas et al., 2012, p. 86, a woman said:

> I feel it is good to deliver in the hospital. In the hospital you could get injections. Medicines are available there and doctor and nurse will take care of you. It is also clean and safe.… (SC, illiterate)

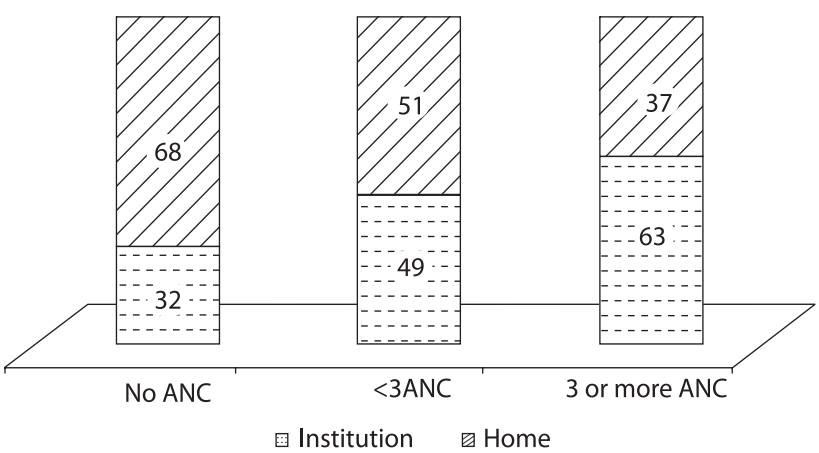
This reason was cited by 72 percent of husbands and 69 percent of mothers-in-law. Qualitative study also shows 21 of 29 mothers-in-law whose daughters-in-law had institutional delivery, and all husbands whose wife delivered in hospital (N=30), mentioned hospitals are a safer environment for delivery than home. For example, as reported in Aruldas et al., 2012, p. 86, one mother-in-law said:

> Today's women can't bear labor pain…and it is beneficial being in the hospital because there is a doctor and nurse and hence they will help immediately if there are any difficulties. Medicines are also available in the hospital. These things are not possible at home.… (High caste, illiterate)

Number of ANC Visits

Institutional delivery was significantly higher (z test, $p<.01$) among those who made the minimum three ANC visits than among those without any visits (Figure 2.6). Results from the logistic regression (Table 2.11) further confirms that even after controlling for individual, family and community level factors, women who made at least three ANC visits were twice more likely (OR=2.2, $p<.01$) to deliver in an institution, compared to those without any visit.

Figure 2.6: Place of delivery by number of ANC visit (percent)



Source: Population Council, formative study, 2011.

Husband's Involvement in Maternal and Child Health Care

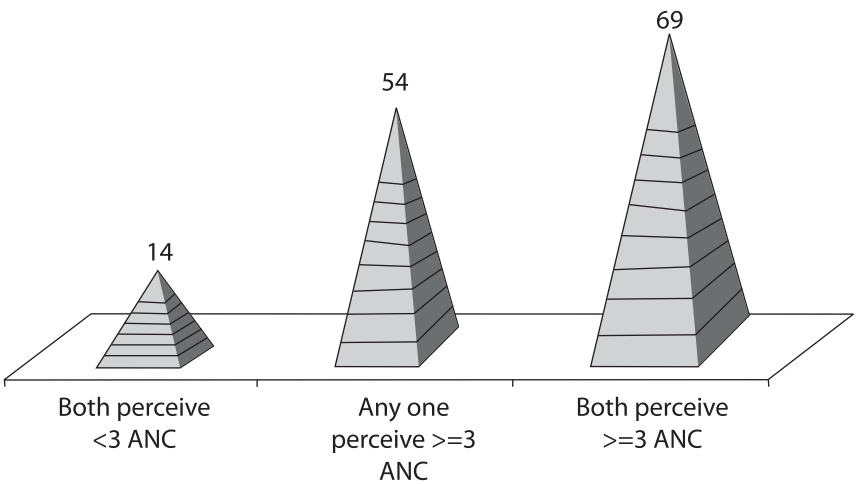
In Bihar, among the 2,568 women, who made at least one ANC visit during their last pregnancy, in 42 percent cases, husbands accompanied their wife at least once (20 percent women were accompanied by their husbands all the times they visited for ANC).

The main reasons for not accompanying were *'husband lives in other place'* (37 percent), *'husband was at work'* (28 percent) and about 10 percent women believed that *'men do not go/have no role in such check-ups or are not needed when women are going'*. The reasons cited by husbands are almost similar to the women's responses. However, 43 percent of women who made at least one ANC visit, reported that they did not ask their husband to accompany them, mainly because husband was busy at work or lives in other place.

It is found that perception of both the spouse have significant positive influence on number of ANC visits women made. When anyone of the spouse perceived at least three visits are essential, in 54 percent of cases women made at least three visits. The percentage went up to 69 percent when both the couples perceived at least three ANC visits should be made (Figure 2.7).

The estimated odds ratio obtained from logistic regression model shows that women who were accompanied by their husband during ANC visit were two times more likely (OR 1.67, $p<.01$) to deliver at health facility, than those not accompanied by husband (Table 2.11, model 2).

Figure 2.7. Three or more ANC visit by women according to couple's knowledge on required number of ANC visit (percent)



Source: Population Council, formative study, 2011.

Fifty three percent of women who delivered at any health facility reported that their husband accompanied them to the facility during delivery. About 30 percent of women reported that their husband accompanied them both the time, during ANC and during delivery. If husbands are accompanying their wives, there is a window of opportunity to advise both of them about other family health behaviors and more importantly to counsel about use of postpartum contraception.

Awareness about JBSY and Contact with ASHA

It is more than six years since JBSY was introduced. Awareness about the scheme is now almost universal (94 percent). The bivariate analysis shows an association between awareness about JBSY and place of last delivery (χ^2 test, $p<.01$). While 32 percent of those women, who had not heard of JBSY, went for institutional delivery, significantly higher proportion (55 percent), of those who knew JBSY, had an institutional delivery (z test, $p<.01$).

The qualitative study shows, among 53 women who had institutional delivery, 33 reported JBSY incentive money was an important reason for choosing hospital delivery.

A woman told:

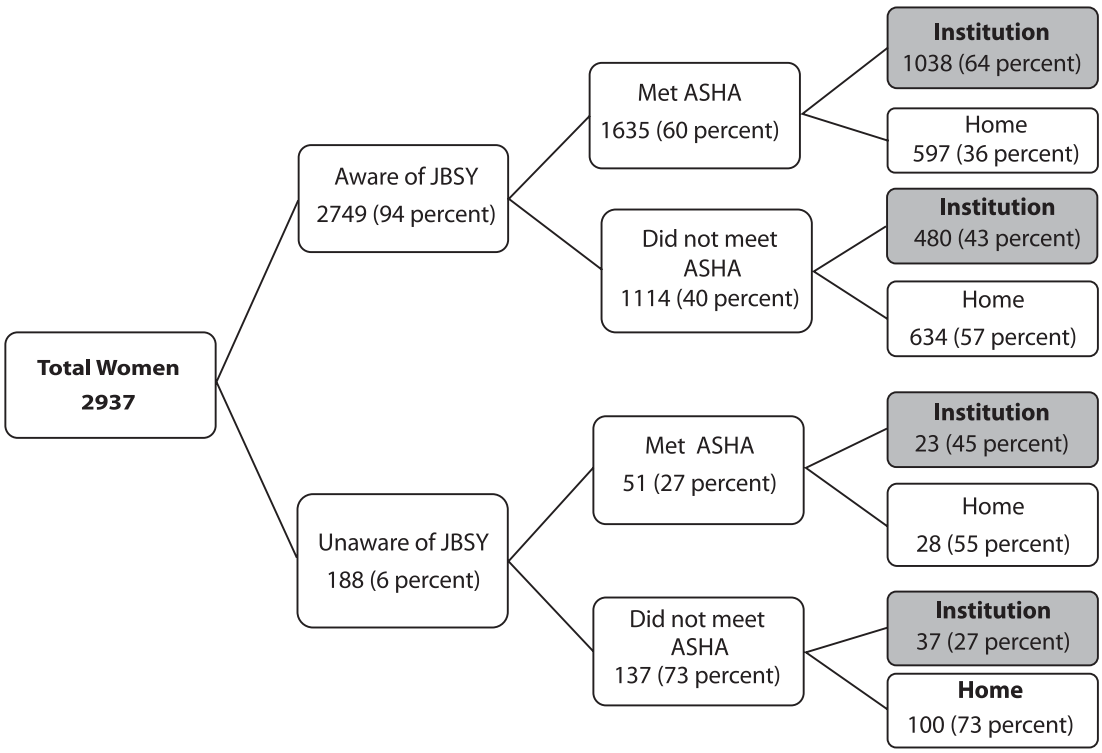
> At the hospital I will get Rs. 1,400 for delivery, while at home I have to spend money and would not get anything back. So I agreed with my mother-in-law and husband to go to the hospital for delivery. (OBC, illiterate) (Aruldas et al., 2012, p. 86)

Along with awareness about JBSY, contact with ASHA makes a significant difference in institutional delivery. Figure 2.8 shows that 64 percent of women who were aware of JBSY and met ASHA, had institutional delivery; while among women aware of JBSY but did not meet ASHA only 43 percent went for institutional delivery. Women who were neither aware of JBSY nor met any ASHA during pregnancy, only 23 percent went for institutional delivery, majority (73 percent) delivered at home.

Distance to Nearest Facility

Presence of any public health facility in the vicinity, where deliveries are conducted, is found to play a significant role in women and families deciding in favor of institutional delivery. While 61 percent of women residing in villages closer (within 5 km) to a public facility went for institutional delivery, only 43 percent did so when a health facility was more than 10 km away (z test, $p<.01$). The results from logistic regression shows that controlling the effects of other individual, family and community characteristics, women residing in close-by villages were two times more likely (OR=2.1, $p<.01$) to have an institutional delivery than those residing in distant villages.

Figure 2.8: Awareness of JBSY, contact with ASHAs, and institutional delivery



Source: Population Council, formative study, 2011.

Village Development

Distance to nearest all weather roads and conditions of roads are other important factors that influence decision in place of delivery. Bad roads from the village to the facility add on to the difficulties in arranging the transportation on time. A woman, who stays about 10 km away from the PHC told:

> It is difficult to get vehicle at night from this village. The hospital is far and the roads are also so bad that none of the vehicles want to go through those roads especially at night. Even if we get a vehicle they will charge us about Rs. 500 at night. We are poor people. We do not have so much money. Because of all these problems I decided that I will not go to a hospital for delivery. (OBC, illiterate)

In case the distance to nearest all weather broad roads are 3 km or more, 46 percent women went for institutional delivery; while the percentage went up to 61 if all weather roads are within village or within one km. Logistic regression also support that chances of institutional delivery is 45 percent higher (OR 1.45, $p<.01$) if women belongs to villages with all weather roads within village or within 1 km than a distance of 3 km or more.

Discussion and Implication for the BCC Strategy

It is evident from the results of the study that about half of the women in rural areas of Bihar still delivered at home instead of institution. Multiple factors, many of which are inter-connected, discouraged women or acted as barriers for institutional delivery. The facility survey data reveals only 5 of the 90 public facilities had all the basic components of providing EmOC services, which means delivery in a health facility does not guarantee for a safe delivery. Although, half of women (48 percent) made at least three ANC visit, the quality of checkups during the visits was poor. While majority of women received at least two TT injections, other components of checkups, which are essential to ensure pregnancy is normal, were not done. Most of the families did not do the essential delivery preparedness, which reduce the chance of maternal deaths. The key reason may be lack of awareness among the family members about the importance or benefits of delivery preparedness.

The widely held perception that if pregnancy is a normal no need to go to an institution for delivery, perceived high cost of institutional delivery and non-availability of transport especially at night, are found to be the main hindrances to institutional delivery. If the previous delivery was at home without any complications, it further reinforces their decision next time to deliver at home. Moreover, and women's lack of decision-making power on the place of delivery also hinder the institutional delivery. Lack of social support, poor perceptions about public facilities also discouraged women from delivery at a public facility. Along with these, there are some system level barriers such as lack of advice to families on birth preparedness, lack of interaction between ASHA and other family members, poor coverage by ASHAs of disadvantaged families living in hamlets and remote villages, lack of privacy and lack of basic health infrastructure in public health facilities.

Some facilitating factors have also found to have significant impact on institutional delivery. An important motivating factor for institutional delivery is the belief among women and family members, that delivery in a health facility is safer for both the mother and child. Women with secondary or higher education, first parity, Hindu and from economically well-off families are availing the benefits of JBSY. The study also found that at least three ANC visit, husband's involvement in maternal care and contact with ASHA could make a huge difference and increase the rate of institutional delivery.

In order to design an effective BCC strategy for further increase in institutional delivery, the following issues need to be considered:

Increase ASHA-Family Contact

A minimum of three ANC visits is found to be a key determinant for institutional delivery. Increased ANC visits and counseling done during the period reinforces the messages given to them. It also familiarizes women with health facilities and reduces her fear of delivery at a strange place. Although more than 80 percent of women, husbands and mothers-in-law know ASHA of their village, contact was much lower. In almost half of the cases (especially in the case of

disadvantaged groups), ASHAs did not meet pregnant women. In only a few cases she met women in the first trimester of pregnancy; thus the opportunity for the minimum three ANC visits gets reduced. Strengthened and supportive supervision of ASHA's work may help increase in ASHA-family contact, which will facilitate in increased ANC visit and thereby institutional delivery.

Increase Advice for Delivery Preparedness

Advice to families on delivery preparedness is very limited and incomplete. The types of advice ASHAs are providing during ANC period are mainly about JBSY money and to call her to accompany to health facility; other important advice on family health are getting neglected to a large extent. This is very purposive, since relatively higher incentive is attached with institutional delivery than promoting other behaviors. The study shows saving money, arranging transportation in advance, deciding place of delivery and facility where one could rush in case of complication have significant bearing in institutional deliveries. Although ambulance facilities like '108' are available in the state, availability of 24/7 ambulances, especially at night, is an immediate requirement for ensuring health service utilization by poor, hard-to-reach populations in remote villages. Local advocacy with *panchayat* members, *Rogi Kalyan Samitis*, and self-help groups within villages for priority transportation, at subsidized cost, for women in labor is necessary. Above all, messages on importance on these issues need to be reinforced through all channels – inter-personal communication, mid-media and mass media.

Increase Awareness about Importance of Delivery Assisted by SBA

Use of a skilled birth attendant (SBA) in case of home delivery is very low; only six percent of home deliveries were attended by any trained health professional. Lesser use of SBA in home deliveries may be due to the fact that lack of SBA availability in rural areas and lack of awareness by families about benefits of SBA assisted delivery, including payment of Rs.500. In order to increase safe delivery, attention must be given so that home deliveries are assisted by an SBA. Right now this is not happening. ASHAs do not advise women and families about the benefits of SBA-assisted home delivery because of conflict of interest. During antenatal visits, health workers should emphasize the benefits of SBA-assisted home delivery, and inform about the provision of the incentive of Rs. 500. Simultaneously, urgent advocacy efforts are needed at statewide and nationally for ensuring SBA availability, especially in remote, rural areas.

Audience Segmentation

Identification of audience, who are most likely not to go to institution, is required to help in reaching the benefit to all segments of population, and focused attention should be given to them to motivate them for institutional delivery. For example, women, whose previous delivery was at home, were more likely to have their next delivery also at home. They should be specifically identified and motivated them for institutional delivery. Women with first parity also need to be

motivated for institutional delivery since one third of them were delivering at home. The same is true for scheduled castes and minority groups who have been generally neglected by ASHAs.

Increase Male Involvement in Maternal Care

Husband's involvement in maternal care is found to be an influential factor for institutional delivery. If husbands are accompanying their wives, there is a window of opportunity to advise both of them about other family health behaviors also including postpartum contraception. The ASHA and ANM could play a more proactive role in increasing their involvement. Access of men to radio, cinema, newspapers and mobile phones is much higher. These media could be used to reach men and increase their involvement in family health and institutional deliveries.

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THREE

Increasing Postnatal Care of Mothers and Newborns Including Cord Care and Thermal Care in Rural Bihar

Deepthi S. Varma and M. E. Khan

Introduction

The postnatal period, which is the first six weeks after delivery, is very critical for both the mother and the newborn. In case of mother as well as newborns the highest risk of death occurs at delivery, followed by the first few hours and days after the child birth. Evidence indicate that an integrated maternal and newborn postnatal care during the first few days after delivery could go a long way in reducing the maternal and newborn mortality and thereby increase the progress towards the achievement of Millennium Development Goals 4 and 5. The World Health Organization recommends essential newborn care practices which include (a) clean cord care: include cutting the umbilical cord with a sterile and sharp instrument, tie it and keep the cord stump clean and dry and not to apply anything on the cord stump to hasten the healing process (b) thermal care: keeping the newborn warm in order to prevent neonatal hypothermia which is defined as an abnormal condition in which the newborn's body temperature drops below 36.5 degree Celsius (Kumar et al., 2008 and 2009) and (c) initiating breastfeeding within first hour after birth in order to reduce neonatal mortality and morbidity (WHO, 1994). Similar to newborns, the first few days after delivery is also a vulnerable period for the mother. Studies have shown that approximately two-thirds of all maternal deaths occur in the postnatal period. The Ministry of Health and Family Welfare (MOHFW, 2000) in its guidelines mandates, two postpartum check-ups of the mother and newborn, one within 48 hours and the second one within seven days of delivery.

Despite the above mandates, the analysis of the NFHS-2 (1998-99) and NFHS-3 (2005-06) data shows that the rate of postnatal check-up among women aged 15-34 years in rural Bihar is only 4 percent and 16 percent respectively[3]. DLHS-3 (2007-08) data shows an increase in the rate to 26 percent. Moreover, the bi-variate analysis indicates that the disparity in percentage of women

[3]Unless stated otherwise, data from NFHS-1, NFHS-2, NFHS-3, and DLHS-3 presented in this chapter are based on an analysis, conducted by the Population Council, of currently married women aged 15-34 in rural Bihar who had given birth in the three years preceding the survey

received postnatal care (PNC) within seven days after delivery by caste and class has increased during 2005-06 to 2007-08. For example, during 2005-06 the difference in percent of women received PNC within seven days after delivery between scheduled caste/ scheduled tribe (SC/ST) and general caste women was 11 percent which increased to 18 percent during 2007-08. Similarly, the difference in percentages for women with low standard of living (SLI) and high SLI has increased from 11 percent in 2005-06 to 29 percent in 2007-08.

The above findings indicate that despite the increase in institutional delivery as a result of the *Janani Suraksha Yojana* (JSY), postnatal care continues to be low. Similarly uptake of various healthy newborn care practices such as follow up cord care and thermal care has also been found to be low. For example, data on clean cord cutting from Uttar Pradesh (UP) has shown that the practice of clean cord cutting is universal (IIPS and Macro International, 2008). However, a recent study by Population Council (PC) in UP indicated that healthy follow up cord care practice involving leaving the cord stump to dry on its own without applying anything has been practiced only by 17 percent of rural women (Varma et al., 2010). Reports from rural UP on thermal care have shown that 68 percent of women have bathed their newborn within 24 hours of birth making them highly vulnerable to hypothermia (Varma et al., 2010). Findings regarding the awareness and practice of skin-to-skin care, an economical and convenient method highly recommended for developing countries such as India, were also very low (Varma et al., 2010; Kumar et al., 2009 and 1998). Traditional beliefs or misconceptions such as an un-bathed newborn is impure or the 'vernix' on a newborn' is dirty was found to be a significant barrier to thermal care (Khan et al., 2011). Moreover, there was a lack of awareness among women and their family members as well as frontline health care workers regarding healthy cord care practices (Khan et al. 2010; Varma et al., 2010).

Similar studies that looked into the awareness and practices of cord care and thermal care in rural Bihar are currently unavailable. The under-five mortality rates in Bihar are 85 deaths per 1,000 live births and the peri-natal mortality that includes still births and infant deaths in the first seven days of birth is 59 per 1000 pregnancies (IIPS and Macro International, 2008). Both the infant mortality as well as the peri-natal mortality is high for rural areas as compared to urban areas in Bihar. Immediate behavior change intervention that could lower the high rate of maternal and infant mortality rate in Bihar is of outmost importance in order to achieve the millennium development goals for India. Therefore, a clear understanding of the various barriers and facilitating factors that could influence the adoption of healthy postnatal, maternal, and newborn care practices is necessary to formulate and successfully implement effective communication strategies for behavior change in the community.

Objectives

In 2010-11, the Population Council conducted a formative study in rural Bihar with the following objectives:

- To explore the current status and postnatal care practices for mothers and newborns including care seeking for complications
- To identify the barriers and factors facilitating the adoption of healthy postnatal and newborn care practices
- To identify programmatic and behavior change communication (BCC) initiatives that could accelerate the adoption of healthy postnatal care practices

Methodology

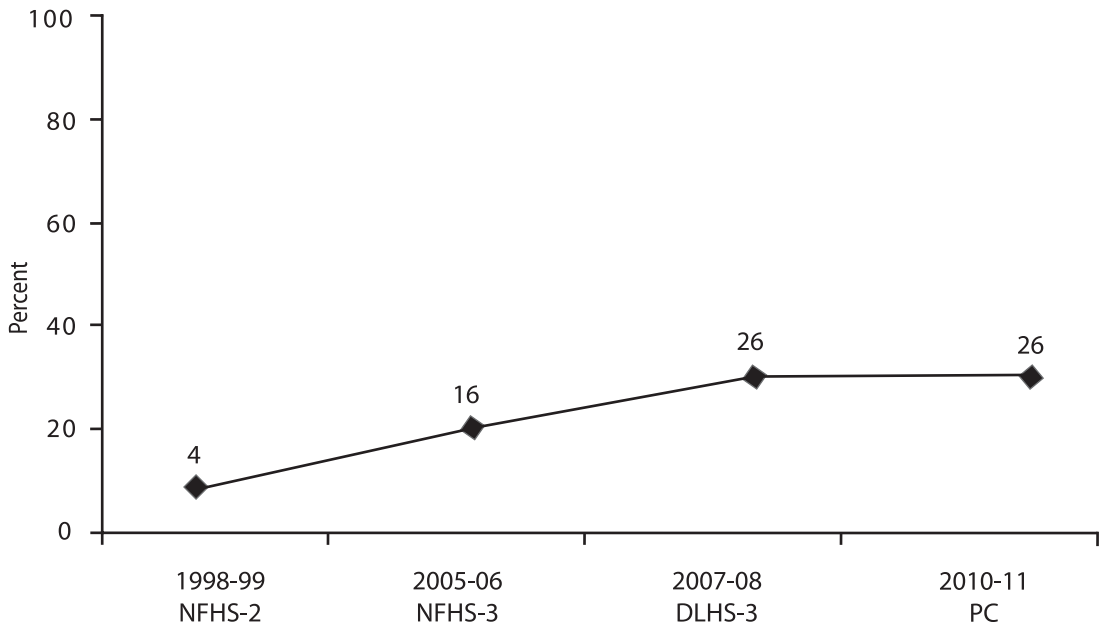
The formative study was conducted in two phases. First, 317 in-depth interviews were conducted with family members, health care providers and *panchayat* members. Qualitative study was conducted in 24 villages: eight villages each from three selected districts located in three different regions.In second phase, a survey was conducted covering 2,941 households, 2,937 currently married women aged 15-34 years who had delivered a child in three years preceding the survey, 723 husbands, 712 mothers-in-law, 212 accredited social health activists (ASHAs), 243 *anganwadi* workers (AWWs), 137 auxiliary nurse midwives (ANMs), and staff at 90 government health facilities (primary health centers (PHCs) and community health centers (CHCs) from 150 villages in nine districts spread across the nine administrative division of Bihar. Some of the findings of secondary analysis of NFHS, DLHS, and qualitative findings given in this chapter have been taken from the study published by Sage Publications (Khan et al., 2012). Details of study design and data collection methods have been discussed in introduction to this book.

Key Findings

Postnatal Care: Current Status

Figure 3.1 show the trend of postnatal care received by women within seven days of delivery in rural Bihar. In 1998-99 (FHS-2), only 4 percent of women received a postnatal check-up within a week after delivery from a health care provider at a facility or home. In 2005-06 (NFHS-3), the percentage increased to 16 and in 2007-08 (DLHS-3), further increased to 26 percent and continues to be the same in the present PC study, 2010-11.

Figure 3.1: Trend in postnatal care in rural Bihar, 1998-2011



***Source*:** Reanalysis of NFHS-2, NFHS-3, DLHS-3, and Population Council, formative study, 2011.
Note: Includes women who received a postnatal check-up from a health provider within seven days of delivery.

Reasons for not Receiving a Postnatal Check-Up

Majority of women, husbands and mothers-in-law (69-71 percent) mentioned that 'everything was normal with the mother and child' as the main reason for not receiving postnatal check-up within seven days of delivery (Figure 3.2). A considerable percent of women, husband and mothers-in-law (20-40 percent) did not consider it necessary to have a PNC within seven days of delivery. Perceived high cost of postnatal check-up, distance to the health facility, and the fact that elderly women in the family were already examining her and hence did not found it necessary to get a check-up done at the facility were the other mentioned reasons. Several other reasons such as lack of awareness regarding PNC, ANM/ ASHA did not come home for check-ups, lack of social support at home; doubts regarding the quality of services provided at the facility were also mentioned by few. For example one woman said:

> I did not go for any check-up within seven days of delivery since the nurse did not tell me to come for any check-up. No one goes back to hospital without the nurse telling us to come again. Moreover, ASHA also never comes to my house, neither before nor after my delivery. Unless someone tells me to go, how would I know that I need to go? (SC, illiterate) (Aruldas et al., 2012, p. 94)

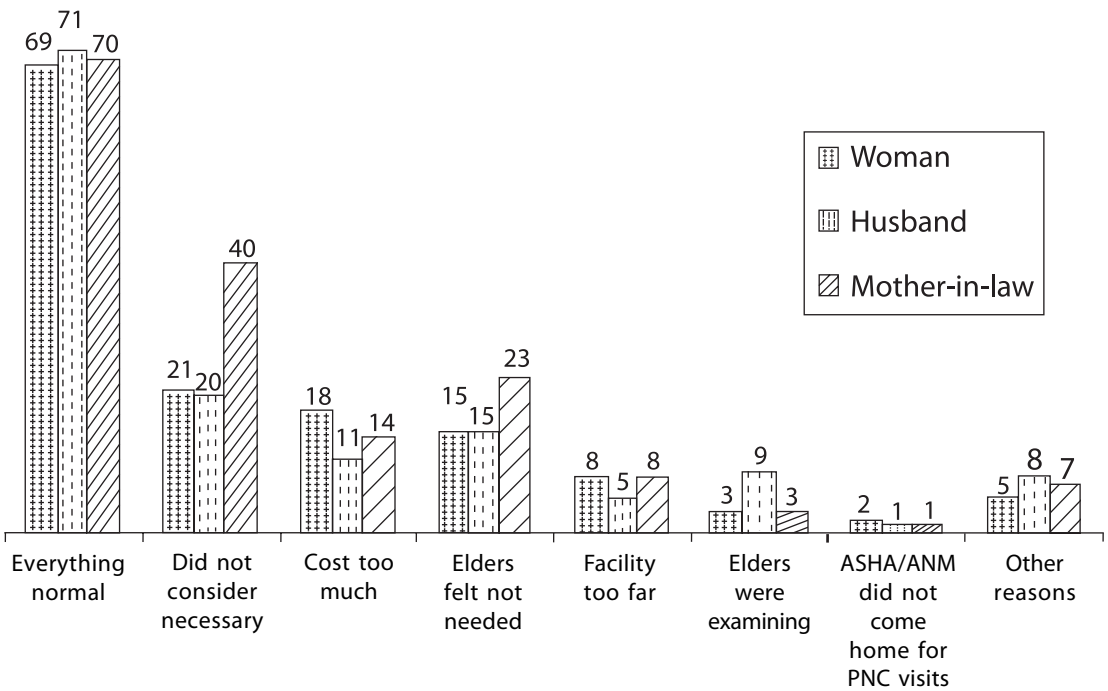
Another woman noted:

> Once we come back after delivery who is going to come to enquire how we are doing? Those who go for such check-ups have lots of money. Those who have money will go for check-ups, what can we do? (High caste, illiterate)

Post delivery confinement of women was mentioned by some of the mothers-in-law and husbands as a reason for not receiving a routine postnatal check-up within seven days of delivery. In-depth interviews with ASHA indicated that many families do not allow ASHA to enter the home or see the newborn or mother due to the custom of post delivery confinement which make it difficult for them to do the postnatal check-ups. One of the ASHAs mentioned:

> Many families will not allow us to see the baby or the woman till they complete the [chatti] sixth day ceremony because they are scared that the baby would get an evil eye…. (SC, educated up to Class 8)

Figure 3.2: Reasons for women not receiving a postnatal check-up as reported by family-level stakeholders (percent)



***Source*:** Population Council, formative study, 2011.

Barriers to Receiving Postnatal Care Services

Lack of perception of need for PNC

More than half of the women (69 percent), irrespective of caste and class, reported that they did not feel the necessity for a post natal check-up within seven days of delivery due to the absence of any health problems for mother and newborn. A typical response by women is as follows:

> My delivery was normal and there was no problem with me or my baby. So I did not do any check-up after delivery anytime. (SC, illiterate)

Ten percent of women said that once they come home after delivery, going back to the facility for a check-up is a costly affair in terms of transportation, loss of wages for the accompanying person and so on.

Cultural barriers like confinement of women for six days after delivery further reduce the chance of PNC. As mentioned earlier, several ASHAs reported that families do not even allow them to enter the room where the woman and newborn stays during the first six days.

The perception of risk for complications that generally motivated women and their family for a check-up was also found to be low. For example, only half of the women (58 percent) and mothers-in-law (51 percent) and 63 percent of husbands perceived that the first day of delivery is risky for the woman and newborn. The perception of risk was found to be drastically decreasing as the number of days after delivery increased. Only 17 percent of women and 16 percent of mothers-in law perceived any risk during the first week after delivery, and it reduced further down to 8 percent and 14 percent respectively up to 42 days after delivery. Similarly, more than one-third (39 percent) of ANMs, and half of the ASHAs (52 percent) and AWWs (48 percent) also believed that the women need to go for a postnatal checkup only if she or her baby has any problems. This indicates lack of awareness among the providers themselves regarding the significance of a routine postnatal check-up. This lack of awareness regarding the significance of a routine postnatal check-up is reflected in the fact that only 65 percent of ANMs and 26 percent of ASHAs and 31 percent of AWWs advised women to have a postnatal checkup within seven days of delivery even if the mother and newborn are doing fine.

In depth interviews also showed that several ASHAs do not insist of routine postnatal check-up within seven days of delivery if the mother and newborn are fine. For example one ASHA said:

> I do not tell about any check up if both the baby and mother are fine after delivery. Why do they need any checkup….? (High caste, educated up to Class 10)

Early discharge from the facility

Findings show that most women (75 percent) who had a normal delivery at a facility were discharged before the mandated 24 hours. For example, among the total 1,578 women who delivered at the facility 43, 17, and 9 percent were discharged within 6, 12 and 24 hours respectively, after delivery.

Only 30 percent of total women who had an institutional delivery stayed for more than 24 hours at the facility. However, in case of women who stayed for more than 24 hours in a facility after delivery, a large majority had a delivery at a private facility or had a caesarean or an assisted delivery. This highlights the fact that women, who had normal deliveries with healthy babies, continued to be discharged before the stipulated 24 hours and hence missed an opportunity for early postnatal check-up.

Analysis showed that only 22 percent of those who stayed at the facility for up to 12 hours (N=956) after delivery received advice on the importance of routine postnatal check-up as compared to 33 percent of women who stayed more than 24 hours (N=475) at the facility (z test, $p<.01$). It indicates the fact that early discharge of women who had normal delivery indeed affects the detailed counseling on the various healthy maternal and newborn care practices.

Women mentioned multiple reasons, partly systemic and partly personal or family inconvenience as reasons for early discharge. For example, 80 percent of women who delivered at a health facility and stayed less than 24 hours said that both women and the baby were normal and hence they did not perceive any need to stay longer at the facility. One woman who was discharged within 3 hours of delivery mentioned as follows:

> Since I had a normal delivery and everything was fine with me and my baby, the nurse told us that we could go home…. (SC, illiterate)

Fifteen percent of women mentioned that lack of support for women at home to take care of their older children or other household chores forced them to get discharged immediately or within 24 hours of delivery. In-depth interviews with health providers also corroborated the fact that lack of support for women is indeed a significant factor that contributes to early discharge from the facility. For example, one ASHA said:

> This woman did not have anyone at home...so she told me to ask for discharge to the nurse. The ANM kept telling her that she needs to stay for 24 hours, but finally I also requested for discharge and hence we were allowed to go…. (SC, illiterate)

Thirty five percent of women also mentioned that the providers such as the ANMs or the ASHAs told them to go home:

> The ANM told us that both the mother and baby are fine and hence we could go home…anyway we cannot stay there for 24 hours even if we want since there are no facilities for food for the woman or bystanders. There is also no hot water available at the hospital…. (OBC, illiterate) (Aruldas et al., 2012, p. 94)

Lack of Adequate Infrastructure at the Facility

Several systemic reasons including inadequate infrastructure at the health facilities, such as lack of electricity, bed, mattress, water and toilet facilities, and provisions for food and stay for the accompanying family members also forced several women as well as providers to take early discharge from the facility after delivery.

One woman who was discharged within four hours of delivery said as follows:

> That place smelled like hell because of the blood and other fluids.…I would have stayed there the whole day if that place was clean. But it was very dirty and hence we came off immediately after delivery.… (OBC, illiterate)

In-depth interviews with ASHAs also indicated that lack of facilities at the hospital motivated them to take an early discharge for their patients. For example one ASHA said:

> We stayed less than 24 hours at the hospital because it is very crowded and if the woman has to stay then she will have to lie on the floor. I thought it is better to go home than make that woman sleep on the floor of the hospital…. (OBC, educated up to Class 10)

Findings from the facility survey (N=90) corroborated the above findings. For example, three-fourths (72 percent) of the facilities in the villages where the survey was conducted had only up to six beds in usable condition. Further, 33-42 percent had clean wards and premises while half of them (49-52 percent) had their premises somewhat clean. Rest of the facilities had their wards and the premises dirty. Although, more than three-fourths (79 percent) of facilities had regular water supply, 21 percent of them did not have a regular water supply at the facility. In case of electricity supply, 18 percent had no electricity supply, almost half of the facilities (48 percent) had electricity supply only for less than six hours in a day, while 33 percent observed to have supply for about 6-12 hours in a day and the only 1 percent had electricity supply for more than 12 hours. Only half of the facilities (50 percent) had functioning and clean toilet.

Lack of Advice on Importance of Routine PNC

Findings show that very little effort was made either by the ANM or by the ASHA, during the antenatal check-ups or during the pre-discharge counseling after institutional delivery, to dispel the misconception that there is no need of a routine postnatal check-up within seven days of delivery if the mother and baby are fine. For example, only 16 percent of women who had at least one antenatal check-up (N=2,568) and 25 percent of women who had institutional delivery (N=1,578), reported that they were advised on the importance of routine postnatal check-up within seven days of delivery. Similarly, 17 percent of husbands and 21 percent of mothers-in-law received any such advice. The qualitative study further reinforces these observations. In the words of a woman informant:

> Neither anyone came home to do a check up for my baby or me, nor did any one advise me that I should go for a check-up within seven days of delivery…. (High caste, illiterate)

Lack of Awareness of Danger Signs

Given the fact that in the present dual cadre system where most of the extension work is shifted to ASHAs, and ANMs are engaged more in provision of clinical services, ASHAs must have strong technical skills to provide PNC advice or to conduct basic examinations of the mother and newborn during home visits in the postnatal period. However, interviews of the ASHAs regarding

the danger signs show that they had inadequate knowledge regarding the danger signs for the mother and newborn. For example, information from ASHAs show that only very few symptoms of mother and newborn were actually checked by ASHAs during their postnatal home visits (Table 3.1). Table 3.1 provides enough evidence that ASHAs did not have adequate awareness regarding the significance of each symptom in case of mother and the newborn.

Certain symptoms were given undue importance as compared to certain very significant symptoms. Moreover, among the total ASHAs interviewed (N=212), 46 percent of them did not check for any symptoms of mother or newborn complication during their postnatal home visits. Half of the ASHAs (42 percent) checked for one symptom and the rest 12 percent checked for any two or more symptoms of maternal or newborn complications. The mean of the observed number

Table 3.1: Symptoms ASHA generally check during postnatal home visits

	Symptoms checked	Percent
Woman	Woman is healthy or weak**	25.5
	Excessive bleeding***	20.8
	Pain in the body or fever***	8.5
	Blood pressure, pulse, eyes, swelling in hands or legs exam **	6.1
	Pain in the lower abdomen**	5.2
	Yellowness of eyes/ body***	3.8
	Breast pain/ breast feeding**	2.3
Newborn	Information on breastfeeding***	25.4
	Child is active/too much crying/ restless/weak***	14.7
	Child feels hot or cold or feverish***	13.7
	Pneumonia***	11.3
	Body of baby yellow**	8.4
	Child is breathless/ breathing excessively***	3.3
	Umbilical sepsis***	1.4
	Weight**	3.3
	Diarrhea**	0.9
Total		**212**

***Source*:** Population Council, formative study, 2011.
Note: Percentages add to more than 100 due to multiple responses.
***Very important, ** Important, *Irrelevant

of symptoms reported by ASHA was less than half in case of mother (0.43) as well as the newborn (0.25). Further, findings reveal that women or their family members were not being adequately advised on the various danger signs of mother and the newborn. For example, only one-third of women (30 percent) who delivered at a health facility were specifically advised regarding the maternal or newborn danger signs that might occur within seven days after delivery and require medical attention. Moreover, among the total 32 percent (N=929) of women who

reported experiencing newborn complications only 36 percent (N=303) sought help immediately. Few women (7 percent) waited till the condition worsened to seek help from a health facility highlighting the lack of perception of risk of newborn complications. Among those who experienced complications only 11 percent (N=109) mentioned that ASHA played any role in helping them to seek immediate care for the newborn.

Facilitating Factors for Postnatal Care

Socio- Demographic Characteristics

Results from this study showed that 43 percent of women with secondary or higher education and 42 percent of those who belonged to households with higher standard of living, received a routine postnatal check-up, while only 22 percent of those who were illiterate or with primary

Table 3.2: Results on logistic regression for postnatal check-up within seven days of delivery

Variables	Categories	Odds ratio
Caste	SC/ST®	—
	OBC	1.04
	Higher caste	1.21
Children ever born	4+®	
	3	1.26
	2	1.31
	1	1.02
Standard of living index	Low®	—
	Medium	0.93
	High	1.24
Education of Women	No education®	—
	Primary	1.21
	Secondary or higher	1.63**
Number of ANC visits	No ANC®	
	<3 ANC	1.03
	>=3 ANC	1.40
Advice on PNC received discharge	No®	—
	Yes	4.83**
Exposure to mass media	No exposure®	
	Exposed	1.29
Place of delivery and duration of stay at facility	Home delivery®	
	0-12 hrs in facility	1.12
	13-23 hrs in facility	1.11
	=>24 hrs in facility	1.91**

***Source*:** Population Council, formative study, 2011.
Note: Dependent variable: PNC check-up within 7 days of delivery (Yes=1, No=0); ®Reference category **p<.01

education and 23 percent of women from households with low or medium standard of living received a routine postnatal check-up within seven days of delivery (χ^2 test, $p<.01$).

Further, logistic regression analysis (Table 3.2) supported the above finding that women with secondary level or more education were indeed more likely (OR=1.63, $p<.01$) to have received a postnatal check-up as compared to women who were less educated. However, other characteristics such as caste, number of children ever born, standard of living of the household in which women belonged and exposure to mass media did not seem to be significant predictor of receiving postnatal check-up within seven days of delivery.

Advice Received on Postnatal Checkup from a Health Care Provider

Women who received specific advice during the time of discharge, on the importance of routine postnatal checkup within seven days of delivery were five times more likely (OR=4.83, $p<.01$) to receive a check-up as compared to those who did not receive such as advice.

Place of Delivery and Duration of Stay at Hospital

Place of delivery and duration of stay at the hospital after delivery were also found to be significant predictors for receiving a postnatal check-up. Twenty eight percent of women who delivered at a public institution (N=1,242) and 56 percent of those who delivered at a private institution (N=336) received a routine postnatal check-up within seven days of delivery as compared to 17

Table 3.3: Items applied on cord stump as reported by women (percent)

Application on cord stump	Place of delivery		Total
	Home	Institution	
Nothing	9.3	10.5	9.9
Gentian violet (blue medicine)	71.9	77.5	74.9
Ghee/Oil	20.4	8.7	14.1
Talcum powder	7.8	12.6	10.4
Ash	2.4	0.8	1.5
Ointment from providers	1.4	1.5	1.5
Harar ghis kar (crushed harar)	1.7	0.8	1.2
Turmeric	0.4	0.6	0.5
Bitter gourd/ Melon water	0.3	0.1	0.2
Breast milk	0.3	0.1	0.2
Camphor	0.7	0.3	0.4
Not sure	0.3	0.3	0.3
Total	**1,578**	**1,359**	**2,937**

***Source*:** Population Council, formative study, 2011.

percent of those who delivered at home (N=1,359) check-up. The logistic regression shows that the likelihood of receiving a PNC within seven days was two times higher (OR=1.91, $p<.01$) among women who stayed in the facility for 24 hours or more as compared to those who delivered at home. However, as observed earlier, because of lack of readiness of the facility and other personal reasons, very few stay at the facility for more than 24 hours, and most of those stayed longer were complicated cases and hence they received PNC.

Cord care: Current Status

Clean cord cutting, using clean blade, was found universal (IIPS and Macro, 2008). However, this study show that irrespective of the place of delivery, only very few women (10 percent) women, did not apply anything on the cord stump as follow up cord care. For example, only 9 percent of those who had home delivery and 11 percent of those who had institutional delivery reported that they did not apply anything on the cord stump. For example, one woman who delivered at a facility said:

> The nurse did not apply anything after cutting the cord; she just tied the cord stump with a thread. She also told us not to apply anything and handed over the baby to the grandmother. (SC, illiterate)

Gentian violet was the commonly reported application, 72 and 78 percent of women who delivered at home and health facility respectively. Few women applied ghee/oil, talcum powder, ash and ointment obtained from providers (Table 3.3). A negligible number of women also reported other miscellaneous substances as mentioned in Table 3.3. One woman who delivered at home mentioned:

> No one told me what needs to be applied after cutting the cord. I myself applied some oil in order to help it heal.…who is there for me to advise all this? (OBC, illiterate)

Interviews with the health care providers such as ANM, ASHA and AWW reveal that they were indeed aware of healthy cord care follow up practices and were providing general advice without being specific in their message. For example, 84 percent of the 137 ANMs and 33 percent of the 212 ASHAs said that they had advised women and their family to keep the cord stump clean and dry. Conversely, only 3 and 6 percent of ANMs and ASHAs respectively reported that they specifically advised women and family not to apply anything on cord stump (Figure 3.3). Twenty one percent of ANMs and 50 percent of ASHAs reported that they advised to apply gentian violet as follow up cord care. However, only 10 percent of women specifically mentioned ASHA and 2 percent said AWW as the source of information on follow up cord care, which highlights a gap in the transfer of accurate information from the health care providers to the women and family members. For example, one woman mentioned:

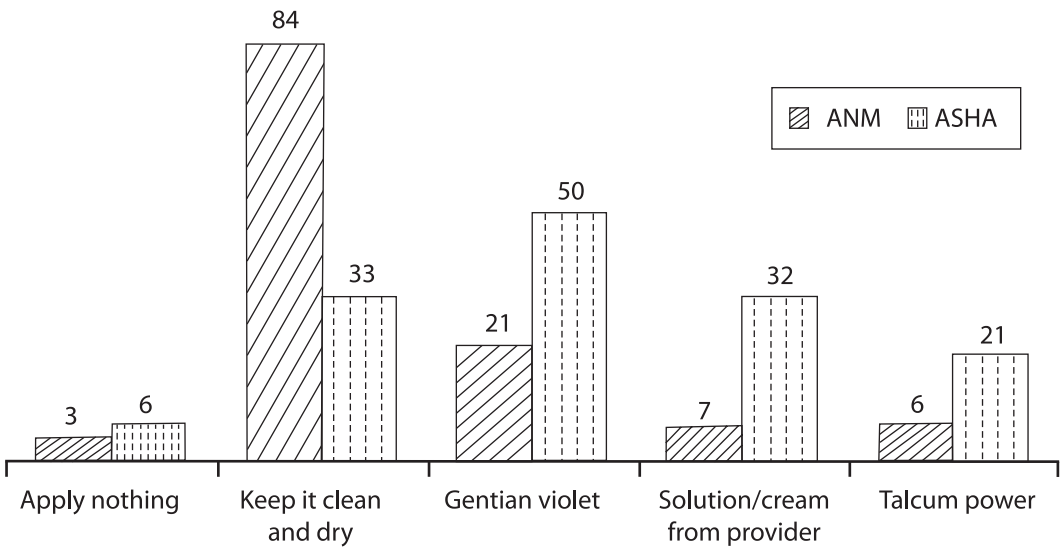
> After cutting the cord, the nurse herself applied the blue medicine on the cord stump.…she also advised us to apply the blue medicine daily to prevent any infection.… (High caste, educated up to Class 7)

Additionally about two-thirds (66 percent) of the women mentioned other providers such as local chemists/village doctors as their source of information on what need to be applied on the cord stump as follow up cord care. For example, one woman who had an institutional delivery mentioned that the doctor at the hospital advised her to apply the blue medicine:

> The doctor there told me that I must apply blue medicine everyday for 3-4 days on the cord stump to prevent any infection…. (SC, educate up to Class 8)

Other frequently mentioned sources of information were mother-in-law (14 percent), other female family members (12 percent) and husband (3 percent).

Figure 3.3: Advice on cord care as reported by ANMs and ASHAs (percent)



Source: Population Council, formative study, 2011.

Barriers to the Adoption of Healthy Cord Care Practices

Belief that Something Needs to be Applied on the Cord Stump

Findings indicate that the community as well as the health care providers continued to believe that something needs to be applied on the cord stump in order to prevent infection and hasten the drying of the cord stump. For example, only 10 percent of the women (N=2,937) did not apply anything on the cord stump. Further, among the family members only 4 percent of the husbands and 3 percent of mothers-in-law reported that nothing should be applied on the cord stump as a follow up care. A typical response by women is as follows:

> I applied warm mustard oil….nothing will happen even if I do not apply anything. But generally we all apply something on the cord stump…. (OBC, illiterate)

Gentian violet was the most frequently mentioned follow up cord care application by women (64 percent), mothers-in-law (82 percent), husbands (59 percent) as well as ASHAs (50 percent). Several women and health care providers believed that gentian violet, which is popularly known as 'blue colored medicine' would prevent infections and hasten the healing of the cord stump. For example, one woman said:

> I started applying the 'blue colored medicine from the second day. My doctor only told me to apply the 'blue colored' medicine for eight days. Actually she wrote the name of the medicine and gave it to me and I bought it from the shop…. (SC, illiterate)

Another woman said:

> The nurse at the hospital told me to apply the [rosnai dawa] 'blue colored' medicine to prevent infection.… (SC, educated up to Class 7)

In-depth interviews with ASHA reveal that they also advised women to apply something on the cord stump. For example one ASHA said:

> I visit the women very frequently after delivery and keep telling her to apply the [malham] ointment on the cord stump so that it would dry and fall off easily. (SC, educated up to Class 10)

Facilitating Factors for Healthy Cord Care Practices

Cultural Practice of Applying Gentian Violet

Three-fourths of the total women reported as applying gentian violet, which is an antiseptic cream and hence could be considered as not a harmful practice. Further, women belonging to households with high SLI were significantly more likely (OR=1.54, $p<.05$) to apply gentian violet or nothing on the cord stump compared to those from households with low SLI. Similarly, women who delivered at public facilities (OR=1.53, $p<.01$) or private facilities (OR=2.17, $p<.01$) were more likely to apply gentian violet or nothing on the cord stump compared to those delivered at home. The above findings highlight the cultural acceptability of the application of gentian violet as a follow up cord care practice that is comparatively healthier and less harmful than applying other substances.

Thermal Care: Current Status

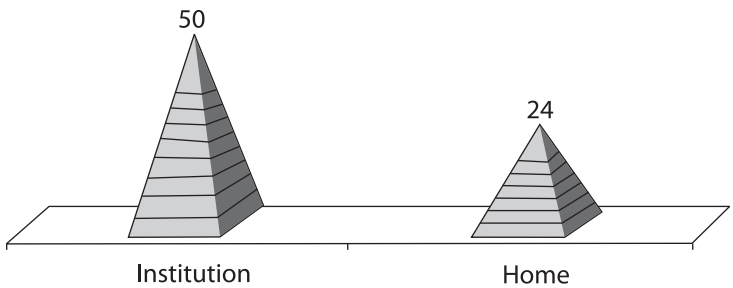
Cleaning and bathing of newborns: Thirty eight percent of the total women(N=2,973), 50 percent from those who delivered at the institution and 24 percent of those who delivered at home, delayed the first bath for more than 24 hours after birth (Figure 3.4). Among those who

delayed bathing (N=1,117), 26 percent bathed on the second day, 37 percent each delayed the first bath of the newborn baby till the third-fifth day or to the sixth day after birth.

Among those who delayed bathing more than six hours of birth (N=1,384), a large majority (93 percent) wiped the baby with dry cloth with or without applying mustard oil:

> After the baby was born we massaged with mustard oil and then wiped with a dry cloth. Then the baby was wrapped in a woolen cloth and given to my mother-in-law…. (High caste, educated up to Class 6)

Figure 3.4: Women who delayed newborn bathing for more than 24 hours (percent)



Source **:** Population Council, formative study, 2011.

In-depth interviews showed that the main reason for delayed bathing is due to the family or community customs rather than the understanding regarding the benefits of delayed bathing. Below is the quote from a woman, who delayed the bathing of her newborn baby for more than 24 hours:

> In our village we bathe newborn only after seven days. Both the [punditji] priest and the nurse at the hospital told me to bathe my baby only after seven days…. (OBC, illiterate)

Skin-to-Skin Care

Findings from this study showed that 9 percent of the total women interviewed (N=2937) and 11 percent of mothers-in-laws (N=712) have heard of skin-to skin care as a method to keep the newborn warm. Among those who knew about STSC (N=254), 69 percent reported that they practiced STSC for their last child (Table 3.4).

Among those who practiced (N=174) only 58 percent were able to explain the correct method of practice. The reasons for not practicing STSC by those who knew about STSC (N=80) for their last child were (a) did not feel the necessity (59 percent) (b) nobody advised (21 percent) (c) did not know about it at that time (20 percent). During in-depth interview frequent response to awareness regarding STSC, which is known as 'kangaroo *vidhi*' in local language, was as follows:

Table 3.4: Knowledge and Practice of STSC for the last child as reported by woman

Know about STSC	Percent
Yes	8.8
No	91.2
Total	2937
Whether practiced	
Yes	68.5
No	31.5
Total	254
Reason for not practicing STSC	
Did not know about STSC at that time	20.0
Nobody advised	21.2
Did not feel any necessity	58.8
Total	80
Method of practicing STSC	
Put naked child on the bare chest and….	57.5
Put the child on mother chest with blouse and…	42.5
Total	**174**

***Source*:** Population Council, formative study, 2011.

> I do not know about kangaroo [vidhi] method. ASHA, AWW aunty or ANM never told me anything about kangaroo [vidhi] method…. (OBC, educated up to Class 10)

Among those who knew about STSC (N=254), three-fourths said that they heard it from health care providers such as doctor (19 percent), ANM (34 percent) or ASHA (22 percent). Twenty nine percent of women mentioned that they were told about STSC by other elder family members while rest of the women mentioned neighbors or friends, Mamta (frontline health care provider appointed only in the state of Bihar) and others such as AWWs as their source of information on STSC:

> No one told me about kangaroo [vidhi] method. But I have seen my [gothni] sister-in-law keeping her newborn on her naked chest and cover with a cloth. Her baby used to be warm. Hence I also did the same thing when I had this baby…. I did not have any problems doing that…. (SC, illiterate)

However 83 percent of the total women mentioned that they did use some method to keep the newborn warm. One woman mentioned,

> It is important to keep newborn warm. Generally we wrap the baby with cotton cloth and then cover with another cloth to keep the baby warm. (High caste, educated up to Class 7)

Moreover, results here shows that only a very small percent of women and mothers-in-law have heard of STSC or knew the exact technique of STSC. On the contrary, three fourths of the ANMs (70 percent) and 39 percent of ASHAs and more than half of the AWWs (53 percent) reported the correct technique of practicing STSC (Table 3.5). These findings also highlight a gap in the knowledge transfer from the health workers to the stakeholders as in case of the cord care practices.

Table 3.5: Awareness regarding the method of Kangaroo Mother Care (KMC) as reported by providers (percent)

Method	ANM	ASHA	AWW
Correct method	70.1	38.7	53.1
Somewhat correct method	16.8	19.3	28
Wrong method	13.1	2.4	18.9
Do not know	NA	39.6	NA
Total	**137**	**212**	**243**

Source **:** Population Council, formative study, 2011.

Barriers to Thermal Care

Cultural Beliefs Regarding Un-Bathed Newborn

Findings from this study showed that the cultural beliefs attached to the newborn being impure and unclean as an important barrier to delayed bathing. For example, among the total mothers-in-law, 43 percent reported 'impurity' and 40 percent said 'newborn being unclean' as reasons for immediate bathing. Further, in-depth interviews with women and mothers-in-law indicated that they indeed have strong cultural beliefs regarding newborn bathing. For example, one woman mentioned:

> I had my delivery at night. Immediately after delivery, dai applied mustard oil and wiped the baby clean with a cloth. Then she wrapped the baby and kept next to me. Next day morning at about 10am dai came again, gave both myself and my baby mustard oil massage and then bathed us. Otherwise it is considered impure and untouchable [chua-choot]. We cannot go out to meet other people without bath. After this the dai came regularly for another six more days and gave us mustard oil massage.… (SC, illiterate) (Aruldas et al., 2012, p. 92)

Another woman said:

> ….my baby was bathed immediately after returning from hospital because otherwise the baby is considered [asudh] impure and no one else can touch the baby. In case anyone touches the baby, they are also considered impure and hence they also have to take a head bath to clean themselves. This is the practice in my village…. (SC, educated up to Class 9) (Aruldas et al., 2012, p. 93)

Box 3.1: Barriers to routine postnatal care and adopting healthy cord care and thermal care practices

Postnatal Care
• Lack of perception of need for PNC • Early discharge from the facility • Lack of adequate infrastructure at the facility • Lack of advice on importance of routine PNC • Lack of awareness of danger signs
Cord Care and Thermal care
• Belief that something needs to be applied on the cord stump • Cultural beliefs regarding un-bathed newborn • Lack of accurate knowledge on STSC

Source **:** Population Council, formative study, 2011.

Several family members believed that the 'vernix' on the newborn's body is dirty and therefore needs to be removed immediately after birth by oil massage and bathing. For example, a mother-in-law observed:

> The baby was born at night and I advised her to bathe the baby with soap and hot water as soon as it was morning because babies generally have dirt [gandagi] on their body after birth. This dirt is cleaned by using hot water and soap. If we delay the bath for three days then the baby will develop boils [danae] all over the body and baby will be in distress. So what is the benefit of delaying the bath of baby? (OBC, illiterate) (Aruldas et al., 2012, p. 93)

Lack of accurate knowledge on STSC

Table 3.4 clearly indicates that almost 91 percent of women have not heard of STSC as a method of keeping the newborn warm, as reported in Aruldas et al., 2012, p. 92:

> I do not know about kangaroo [vidhi] method. No one has told me about it till now…. (High caste, illiterate)

Table 3.4 also shows that even among those who are aware of STSC, very few actually follow the correct practice. For example, one woman said:

> I knew kangaroo [vidhi] method and I did that for my last child. But my baby was wearing clothes and I was not wearing my blouse. I kept the baby on my chest and covered by a cloth. I kept the baby like that for about 20 minutes while the dai was doing an oil massage for me.…by doing so both mother and the baby would get warmth. (SC, illiterate)

Among providers, only very few ASHAs could explain the exact technique of practicing STSC highlighting their own lack of understanding of the exact technique of STSC. This has led to teaching inaccurate technique to the woman, by omitting or not giving appropriate attention to details such as 'a naked baby should be kept on to the bare chest of the mother'.

For example one ASHA, who said that she was taught STSC during her training, mentioned the method as follows:

> ….wrap the baby in a clean cotton cloth and keep the newborn on mother's chest. (High caste, educated up to Class 8) (Aruldas et al., 2012, p. 92)

Another ASHA said:

> I always advise women to wrap the baby in three layers of clothes during winter seasons and two layers of clothes during summer season to keep the baby warm.... (SC, educated up to Class 10)

This indicates strong gaps at two levels (a) lack of transfer of knowledge from the health care provider to the end-user (b) faulty understanding of the health care providers themselves regarding the technique and transfer of these faulty techniques to the end user.

Facilitating Factors to Thermal care

Awareness Among Providers on Disadvantages of Immediate Bathing

Findings from the providers also showed encouraging results with regard to the awareness on the negative effects on immediate bathing of the newborn (Figure 3.5). Only 10 percent each of ANMs and ASHAs and 19 percent of AWWs mentioned that there are no disadvantages in bathing a newborn immediately. Eighty six percent of the total ANMs, 80 percent of ASHA and 72 percent of AWWs reported that immediate bathing may lower the baby's body temperature making it vulnerable to catch cold and other illnesses.

Ten percent of ANMs and 19-22 percent of AWWs and ASHAs also mentioned that immediate bathing of the newborn baby may cause death:

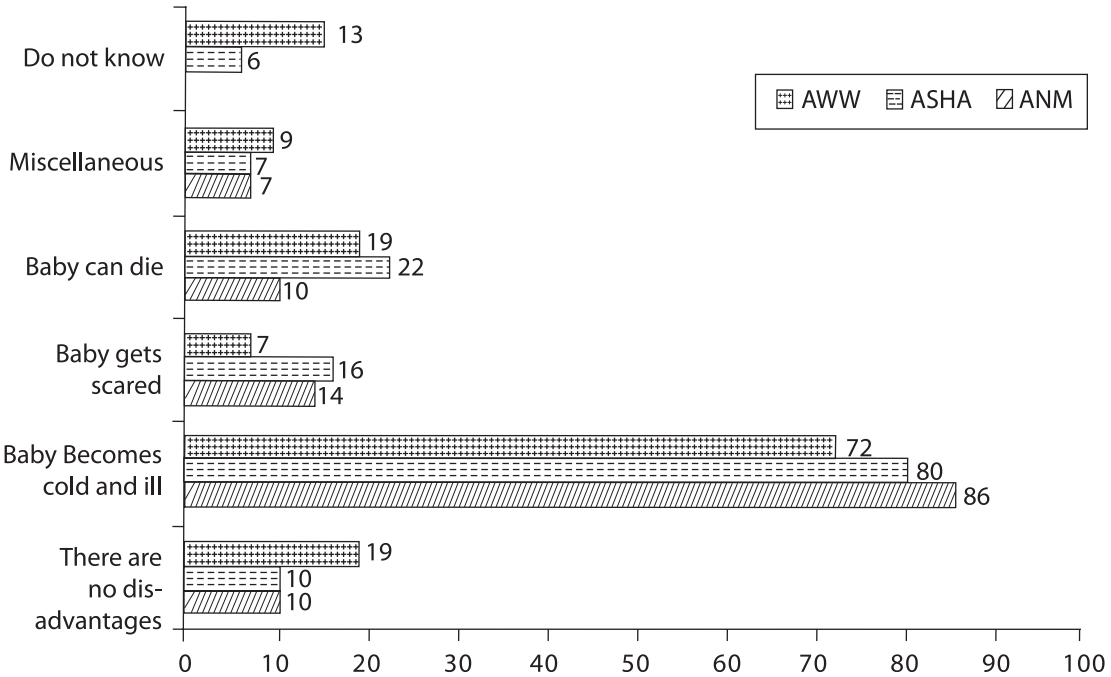
> If the baby is bathed immediately after birth, the baby may get a cough, cold or pneumonia. (High caste, educated up to Class 8) (Aruldas et al., 2012, p. 90)

> Baby stays warm inside mother's stomach and hence baby may feel cold if bathed immediately after birth.… (OBC, educated up to Class 10)

However, only a quarter (26 percent) of the total women who delivered at a health facility reported that they were advised not to bathe the newborn for 24 hours. As mentioned earlier in this chapter, this highlights the gap in the transfer of knowledge from the health care workers to the end users resulting in the continuation of unhealthy practices in the community.

Findings here indicate that women, family members and providers strongly believe that the newborn needs to be kept warm and hence follows several techniques to keep the baby warm. Unfortunately, they are unable to connect it to the fact that delaying the bathing and practice of STSC also could ensure that the newborn's body temperature never falls below the required 34 degree Celsius.

Figure 3.5: Disadvantages of early bathing as mentioned by health care providers



Source **:** Population Council, formative study, 2011.

Cultural practice of delaying the first bath: More than half the women from Purba Champaran (58 percent) and Gopalganj (54 percent) delayed the bathing for more than 24 hours as compared to only 22-27 percent of women from Darbanga and Saharsa indicating the existence of a culturally endorsed healthy practice of delayed newborn bathing in certain parts of Bihar.

In depth interviews with women and health workers also indicated that it is indeed the custom of certain villages or communities to delay the first bath of the newborn rather than the understanding of the benefits of delayed bathing. For example one woman from Purba Champaran said:

> I do not know the reasons, but all newborn babies in our village are bathed only after four days. So I also followed that rule. I do not think any problems will happen if the newborn is bathed earlier.… (High caste, educated up to Class 6)

One of the ASHAs said:

> Most women in this village bathe the baby after 2 days. Some families also consult a [punditji] priest and see a good date after five or six days or after 12 days to bathe the newborn….(High caste, educated up to Class 9)

Box 3.2: Facilitating factors to routine postnatal care and adoption of healthy cord care and thermal care practices

Postnatal Care
• Maternal education • Receiving advice on postnatal check-up from a health care provider • Institutional delivery and longer stay at the facility
Cord Care and Thermal care
• Cultural practice of applying gentian violet • Awareness among providers on disadvantages of immediate bathing • Cultural practice of delaying the first bath • Awareness and practice of keeping a newborn warm

***Source*:** Population Council, formative study, 2011.

Awareness and practice of keeping a newborn warm: Eighty three percent of the total women interviewed mentioned that they did use some technique or other to keep the newborn warm immediately after birth. The various techniques mentioned by the mothers-in-law to keep the newborn warm were wrapping the newborn in warm clothes (83 percent), keeping the baby close to the body or to the chest of the mother (8 percent), keeping a fire burning inside the room where the newborn was kept (2 percent), applying or massaging the newborn with warm oil (2 percent). A small percent of the total women (6 percent) said that they practiced STSC in order to keep the newborn warm. Frontline workers also mentioned similar techniques as mentioned by the women and her family (Table 3.6). Skin to skin contact (STSC) with the mother was also mentioned by a large number of ANM (77 percent), ASHA (42 percent) and AWW (50 percent).

Discussion and Implications to Behavior Change Communication

Postnatal Care

Segmentation of Audience

Results here show that the rate of postnatal check-up in rural Bihar continues to be low despite that increased rate of institutional delivery after the introduction of JSY scheme. However, young couples (15 to 25 year old) with higher level education and those who had institutional delivery had accessed routine postnatal check-up as compared to their counterparts. This highlights the need to develop an integrated postnatal care strategies that give due emphasize to illiterate, poor and hard-to reach, groups of mothers and newborns. Women who are educated and are already practicing the healthy behaviors in the community could be utilized in diffusing the healthy practices to other layers of society.

Table 3.6: Techniques suggested by providers to keep the newborn warm (percent)

Techniques suggested *	ANM	ASHA	AWW
Wrap newborn baby in warm cloth	81.8	86.9	88.1
Skin to skin contact with mother	76.6	41.5	49.8
Stay in a heated room	35.8	18.9	23.0
Massage newborn baby with oil	24.8	32.1	31.7
Not bathe newborn for few days after birth	2.2	3.3	0.8
Breastfeed frequently (every 1-2 hours)	5.1	2.8	2.5
Others	8.8	8.0	12.3
Do not know	0.7	2.4	1.2
Total	**137**	**212**	**243**

Source: Population Council, formative study, 2011.
Note: Percentages add to more than 100 due to multiple responses.

Focused Counseling on PNC

Logistic regression analysis showed specific advice received for PNC during ANC or during pre discharge counseling, and place of delivery and duration of stay at the hospital after delivery increases the likelihood of routine postnatal check-up among women. However, even among those who delivered at a health facility, 66 percent of women did not receive a routine postnatal check-up. This highlights the fact that, though delivering at a facility increases the likelihood of postnatal check-up that alone is not sufficient enough to ensure all women receive routine postnatal check-up. Specific counseling on the importance of routine postnatal check-up within seven days of delivery by a health care provider before discharge is a very important component.

Given the time constraint of today's society the communication must focus on those issues that are critical and the end user most need to understand. For example a communication strategy to improve postnatal check-up must emphasis the point that women and newborn need to have a postnatal check-up within seven days even if both are doing fine. In this communication *'even if both are doing fine'* is a critical component that will contribute to increase in the number of women who receive routine postnatal check-ups. Moreover, the source of such communications need to be skilled and trustworthy, which emphasize the need to provide adequate communication training on relevant behaviors to all the frontline health workers who are in close contact with the community. As mentioned in earlier studies, any behavior change communication must be simultaneously accompanied by certain degree of system level changes, in terms of improved capacity building of the health care providers as well as improving the infrastructure of the available health facilities, which would catalyze the adoption of healthy practices by the community.

Focused Messages of Postnatal Danger Signs for Mother and Newborn

Absence of checking the symptoms for important maternal and newborn complications during the postnatal visits by ASHA in this study stress the need for adequate training for these frontline health workers. These findings highlight that providers, women and her family members need to be educated on the various danger signs that could prove fatal to the mother and newborn if not detected and treated on time. Detailed counseling to the providers, especially ANM and ASHA, on the multiple benefits of postnatal check-up for the mother and newborn, with special focus on the various complications that could happen to them during the first week of delivery is an urgent need.

Postnatal Home Visits by Health Care Providers

Barriers such as distance to the facility or the increased cost involved in arranging transportation and travelling to and from the facility indicate the need to deliver the services closer to community. Postnatal confinement of women and the newborn for certain number of days and belief in the examination done by elders in the family also prevent women from accessing postnatal services either by visiting a health facility and or by home visit of a health worker. Though these are age-old traditional beliefs and practices, earlier studies have shown that involvement of local health care providers with the help community and religious leaders could bring a sustainable change in these practices (Khadka, 2005). Therefore, the ASHA, and whenever possible the ANM, have to play a more proactive role by visiting the family within seven days to do a basic check-up, identify danger signs, and make appropriate referral to higher level health facilities. However, at present ASHAs do not have the competency-based training and standardized check list to provide these services. Therefore there is an urgent need to reorient the format of the ASHA training program in Bihar in order to make them more effective in their work.

Cord Care and Thermal Care

Focused Message on Healthy Practices

There is a lack of awareness regarding specific healthy practice in case of cord care and thermal care among the providers. For example, in case of cord care only 3 and 6 percent respectively of ANM and ASHA reported that they advise not to apply anything on cord stump as the correct cord care practice. Moreover, 50 percent of ASHAs and 21 percent of ANMs indeed advised to apply gentian violet on the cord stump thereby reinforcing an already existing faulty practice within the community. Therefore, messages that specifically highlights the fact that *'nothing needs to be applied on cord stump, not even gentian violet'* in order to prevent infection or hasten the healing must be given to women, family members as well as all frontline health workers. Another possibility is to promote the already acceptable practice of applying gentian violet on the cord stump as a universal practice and then teach them how to apply it in a hygienic manner.

In case of thermal care, though majority of ANMs and ASHAs indeed mentioned that it is disadvantageous to bathe the newborn immediately after birth highlighting a strong perception of risk among the healthcare providers, very few actually advised the women to delay the bathing of newborn for more than 24 hours. Several of the ASHAs and ANMs are indeed aware of STSC as a technique to keep the newborn warm. However, only a small percent of women reported that they have heard about STSC and still smaller number of women actually practiced the correct technique of STSC for their last child. This again highlights the fact that it is not enough that the health care providers are knowledgeable but they also need to be trained in effective communication of the knowledge to the end users. The providers and family also need to be given messages that clearly explain the link between delayed bathing, practice of STSC and keeping the newborn warm. Pictorial presentations on the walls of the waiting areas of facilities would be helpful in creating a clear understanding of the exact technique of STSC among women and providers.

Involving 'Pundits' or Community Leaders

The distinct regional variation of the timing of newborn bathing highlighted the contradictory beliefs and practices among people belonging to the same state and hence the need to develop and implement community specific communication strategies. For example, more than half the women in Purba Champaran and Gopalganj bathed the newborn after 24 hours while only a quarter of women in Darbanga and Saharsa delayed the newborn bathing. Interestingly, the reasons for both immediate bathing as well as delayed bathing were local customs and cultural beliefs. Some community believed that newborn is 'impure' and 'dirty' and hence needs to be bathed immediately after birth while the other community believed that they need to delay bathing till the 'pundit' gives them as auspicious date and time. This finding highlights the fact that communication strategies that reflects a 'one-size-fits-all' approach will not work. Government must adopt communication strategies that take into account the unique cultural and social contexts of each community in order to make it fully effective during implementation. It also shows the potential of utilizing the women or community leaders, from those communities where they are already practicing delayed bathing, as channels to remove the beliefs on 'pollution' and 'un-touchability' in order to bring about behavior change among other areas of Bihar.

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FOUR

Increasing Early and Exclusive Breastfeeding in Rural Bihar

Kumudha Aruldas, M. E. Khan and Avishek Hazra

Introduction

Early breastfeeding is defined as initiation of breastfeeding within one hour of birth; exclusive breastfeeding is feeding an infant, till age six months, only breast milk without addition of any other food, milk, fluid or water (GOI, 2004). Early breastfeeding is one of the known best practices, which, if implemented widely, can reduce neonatal mortality rate by 20 percent (Mullany et al., 2008). Exclusive breastfeeding has shown to protect infants against diarrhea, respiratory infections, and low growth rate (Diallo et al., 2009). Similarly, there is also a significant association between diarrhea and acute respiratory infections and lack of exclusive breastfeeding (Mihrshahi et al, 2007).

Secondary analysis of National Family Health Survey-3 (NFHS-3, 2005-06)[4] data shows that only around 4 percent of women aged 15-34 years in rural Bihar had initiated breastfeeding within one hour of delivery, indicating a decline of two percent points since NFHS-2 in 1998-99 (7 percent). The analysis of District Level Household Survey-3 (DLHS-3, 2007-08) data shows that although there has been an improvement in practice of early breastfeeding, it was only around 16 percent. DLHS-3 shows that even by 24 hours after delivery only 56 percent initiated breastfeeding. There has not been much improvement since DLHS-3 to National Rural Health Mission (NRHM) concurrent survey, 2009, which is 16 percent.

Analysis of DLHS-3 data by background variables shows that a larger proportion of women who belong to other backward casts, religious minorities, were not educated or less educated and a low standard of living had delayed initiation of breastfeeding as compared to their counterparts. In contrast, a relatively larger proportion of women who had institutional delivery had breastfed their newborn within one hour of birth as compared to those who had home delivery (21 percent

[4] Unless otherwise indicated, data from NFHS-1, NFHS-2, NFHS-3, DLHS-3 and concurrent evaluation of NRHM presented in this chapter are based on an analysis, conducted by the Population Council, of currently married women aged 15-34 in rural Bihar who had given birth in the three years preceding the survey.

versus 14 percent). Analysis also reveals that just 24 percent of children aged 0-6 months in Bihar were exclusively breastfed till the age of six months.

The literature review also shows education of women, high standard of living, receiving at least three antenatal checkups, receiving postnatal checkups, delivery by a skilled birth attendant, contact with frontline health workers, exposure to mass media and involving men in health education programs are factors influencing early breastfeeding (Agarwal et al., 2007; Baqui et al., 2007; IIPS and Macro International, 2007; Kulkarni, 2004; Kumar et al., 2008; McDivitt et al., 1993; Ram et al., 2000). Early initiation of breastfeeding further influences practice of exclusive breastfeeding; studies show infants who were breastfed in first 24 hours were more likely to be exclusively breastfed than late initiators (Mullany et al., 2008). Some of the barriers to early breastfeeding are perception among women and family members that breast milk is not produced in the first 2-3 days, colostrum is harmful and newborns cannot digest it, lack of confidence among women that amount of breast milk being produced is adequate for the child and frontline health workers' belief in community traditions regarding breastfeeding practices (Bandyopadhyay, 2009; Dadhich and Agarwal, 2009; Ram et al., 2000; Reissland and Burghart, 1988; Yadav and Singh, 2004). A focused and sustained communication strategy is required to address the barriers to adopting desired behaviors (Khan et al., 2011a). However, context specific information for Bihar needs to be identified for designing and implementing an effective behavior change communication strategy for breastfeeding practices.

In this context, a formative study was undertaken by the Population Council in 2010-11 with the objectives to (a) determine current status and trends of early and exclusive breastfeeding in rural Bihar, (b) identify factors that act as barriers and facilitating factors in adopting desired breastfeeding practices and (c) draw implications for BCC initiatives that could accelerate adoption of desired breastfeeding practices.

Methodology

The formative study was conducted in two phases. First, 317 in-depth interviews were conducted with family members, health care providers and *panchayat* members. Qualitative study was conducted in 24 villages: eight villages each from three selected districts located in three different regions. In second phase, a survey was conducted covering 2,941 households, 2,937 currently married women aged 15-34 years who had delivered a child in three years preceding the survey, 723 husbands, 712 mothers-in-law, 212 accredited social health activists (ASHAs), 243 *anganwadi* workers (AWWs), 137 auxiliary nurse midwives (ANMs), and staff at 90 government health facilities (primary health centers [PHCs] and community health centers [CHCs]) from 150 villages in nine districts spread across the nine administrative division of Bihar. Some of the findings of secondary analysis of NFHS, DLHS, and NRHM and qualitative findings given in this chapter have been taken from the study published by Sage Publications (Khan et al, 2012). Details of study design and data collection methods have been discussed in introduction to this book.

Key Findings

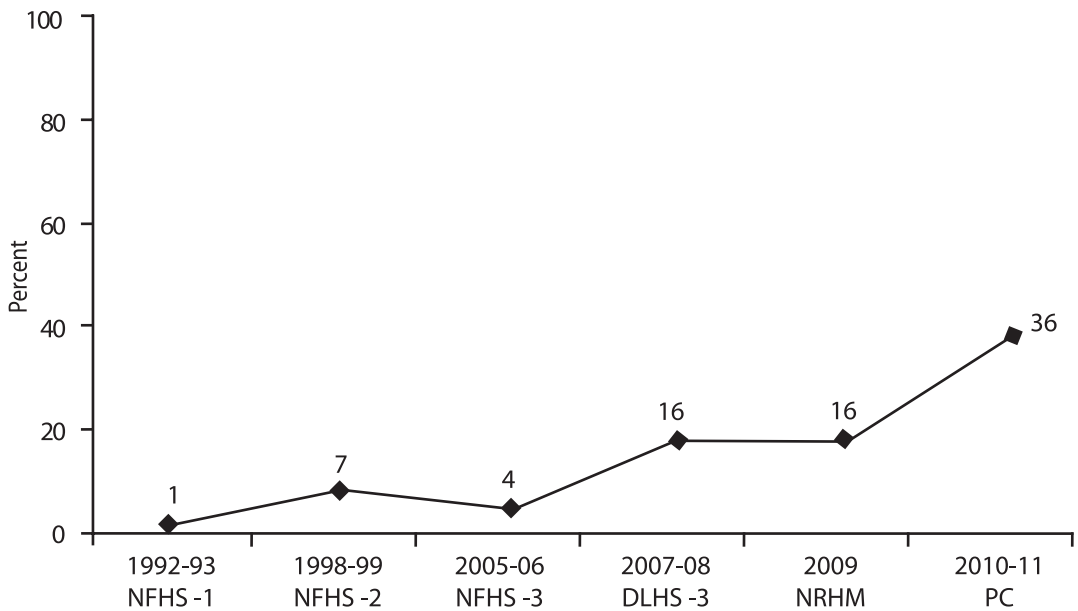
In this chapter, findings on early and exclusive breastfeeding have been grouped into: status of early breastfeeding and prelacteal feeding, status of colostrum feeding, status of exclusive breastfeeding, barrier and facilitating factors to healthy breastfeeding practices.

Early Breastfeeding

Current Status and Trends

The formative study conducted by Population Council (PC) reveals that 36 percent (N=2,937) of women initiated breastfeeding within one hour of birth of their child. The NRHM data (2009) reveals that only about 16 percent of the women breastfed within one hour of delivery. A trend analysis shows that the practice is improving; the percent of women breastfeeding within an hour has increased from 1 percent in 1992-93 to 36 percent in 2011; 35 percentage point increase in 19 years (Figure 4.1). The increase in rate of early breastfeeding has been after 2005, when Janani Bal Surakhsha Yojana (JBSY), a scheme to promote institutional delivery was introduced and the Accredited Social Health Activists (ASHA) was appointed to promote women to adopt healthy maternal and child health practices. However, the maximum increase of 20 percent points was noticed during 2009 (NRHM) to 2010-11 (PC) (Hazra and Khan, 2012).

Figure 4.1: Trend in early breastfeeding



Source: Reanalysis of NFHS-1, NFHS-2, NFHS-3, DLHS-3, and NRHM and Population Council, formative study, 2011.

As shown in Table 4.1, in 2005-06 (NFHS-3) early breastfeeding was marginally higher among women who were Hindu, from households with high standard of living index (SLI) and secondary education. Although, early breastfeeding has markedly increased in all categories since 2005-06, the disparity between advantaged and disadvantaged has further widened except for caste. The maximum disparity of 40 percent was witnessed with regard to religion among Hindus versus others. In case of general caste versus scheduled caste (SC) /scheduled tribe (ST) the relative disparity was -200 percent in 2005-06 which has decreased to -13 percent.

To some extent this is in agreement with Rogers' diffusion theory, which expects early change among opinion leaders and educated or better-off people as compared to the masses.

In 2009 (NRHM), 23 percent women who delivered at institution and 13 percent women who delivered at home practiced early breastfeeding. The study shows an increase both among women who delivered at institution (44 percent) as well as at home (27 percent but the difference in early breastfeeding is highly significant among women who delivered at institution than at home (z test; $p<.001$).

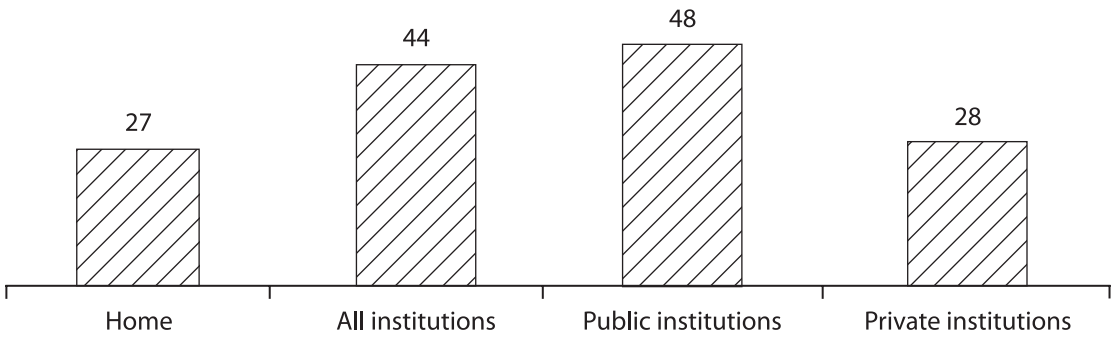
Table 4.1: Relative disparity in the percentage of newborns breastfed within one hour of birth by selected characteristics, NFHS-3 (2005-06) and PC (2010-11) (percent)

Characteristics	Relative disparity	
	2005-06 (NFHS-3)	2010-11 (PC)
Hindu vs. others	7	40
General caste vs. SC/ST	-200	-13
High SLI vs. low SLI	10	22
Secondary vs. no education	8	28

Source: Reanalysis of NFHS-3 and Population Council, formative study, 2011.

As seen in Figure 4.2, findings reveal that among women who delivered at institution early breastfeeding was significantly higher among women who delivered at public institutions (48 percent; N=1,242) compared to private institutions (28 percent; N=336) (z test; $p<.001$). In fact, there is no significant difference in early breastfeeding practice among women who delivered at private institution and at home.

Figure 4.2: Early breastfeeding by place of delivery (percent)



Source: Population Council, formative study, 2011.

At institutions, apart from auxiliary nurse midwives and nurses, who conduct most of the deliveries, there are two other health care providers – ASHA and Mamta. ASHA is a community based health worker who is expected to facilitate women to go to institution for delivery, be present at the time of delivery and counsel women about early and exclusive breastfeeding. Mamta is often a traditional birth attendant from the neighboring communities appointed at the PHCs to promote and facilitate newborn care practices including breastfeeding. Efforts of these health care providers could explain the improving status of early breastfeeding among women who deliver at institutions. However, overall early breastfeeding is low in Bihar and the findings indicate missed opportunities to promote early breastfeeding at health facilities where the health care provider is present at the time of delivery. This highlights the importance of sustained counseling and education to women to adopt breastfeeding practices to an extent that it becomes a community norm.

The study showed no gender disparity in early breastfeeding (36 percent among both boys and girls. The bi-variate analysis, shows an association between types of family and initiation of breastfeeding (χ^2 test, $p<.001$). Around 40 percent of women who belonged to joint families (N=1,531) practiced early breastfeeding compared to 36 percent (N=1,406) from nuclear families (z test, $p<.001$).

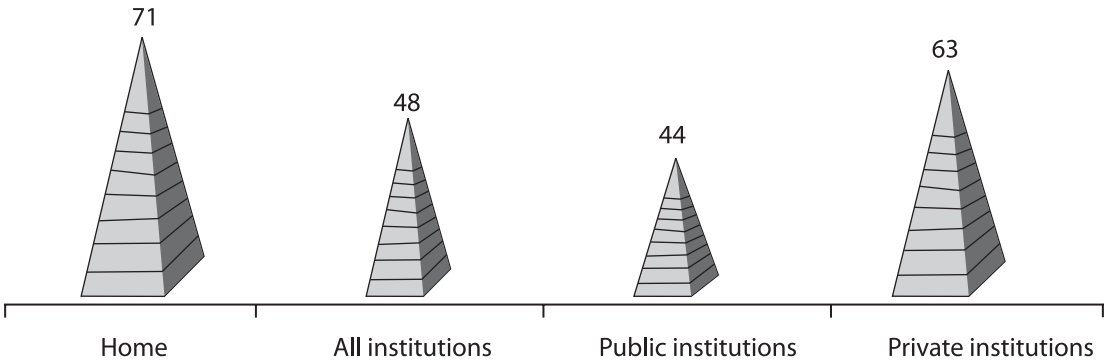
Prelacteal Feeding

Practice of giving prelacteal feeds to newborns still prevalent in rural Bihar, though it shows a declining trend to 59 percent on 2010-11from 90 percent in 2005-06 (NFHS 3). Animal milk (24 percent), honey (16 percent), sugar/jaggery with water (11 percent) or just plain water (10 percent) were the most common prelacteal feeds given. Whenever water was used either in animal milk or in making sugar solution, most women (79 percent) reported using boiled water which reduces the chances of infection to the newborn.

Prelacteal feeds as reported by women who delivered at home (71 percent; N=1,369) was significantly higher as compared to those who delivered at institution (48 percent; N=1,578)

(z test, $p<.001$). As shown in Figure 4.3, among women who delivered at the private institutions, significantly higher percentage of them (63 percent; N=336) gave prelacteal feeds compared to women who delivered at public institutions (44 percent; N=1,242) (z test, $p<.001$).

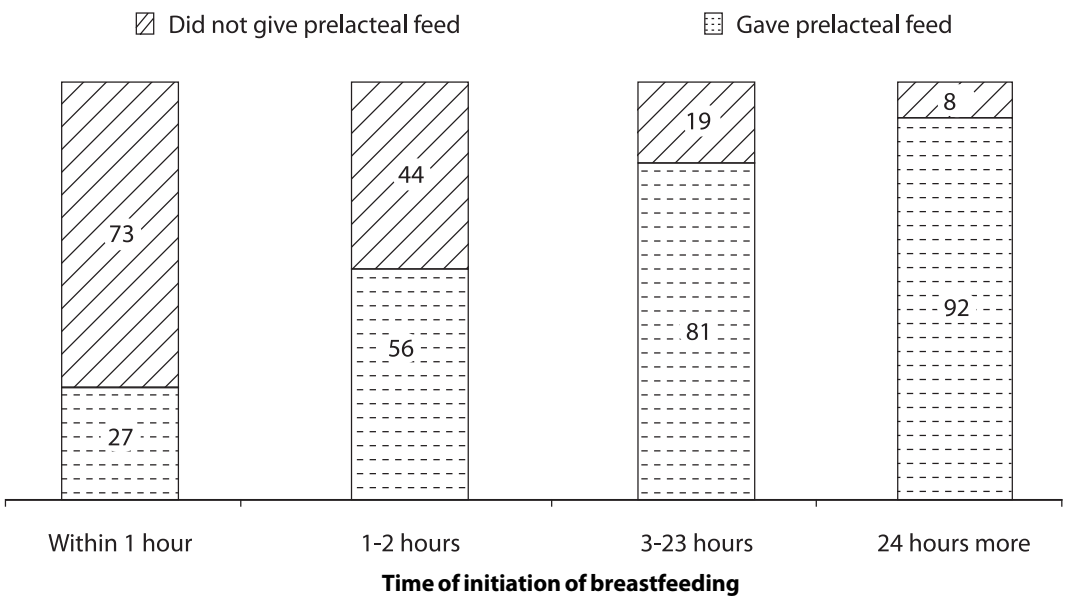
Figure 4.3: Prelacteal breastfeeding by place of delivery (percent)



Source: Population Council, formative study, 2011.

Further analysis shows significant association between prelacteal feeding and timing of initiation of breastfeeding after delivery (χ^2 test, $p<.001$). Earlier the breastfeeding is initiated, lesser is the chance of giving prelacteal feeds (Figure 4.4). For example, only 27 percent of women who breastfed early gave prelacteal feeding whereas women who delayed breastfeeding to 1-2 hours 56 percent of them gave prelacteal feed.

Figure 4.4: Prelacteal feeding by time of initiation of breastfeeding (percent)



Source: Population Council, formative study, 2011.

Qualitative study did not reveal any tradition or custom related to prelacteal feeding. Women did not consider giving prelacteal feeds like honey or sugar water was a ritual.

Perceived Benefits of Pre-Lacteals Feeding

Qualitative study by Aruldas et al., 2012, revealed that because women were not producing any milk soon after delivery, prelacteal feeds were necessary for the child to have strength (33 out of 46). One woman from scheduled caste said:

> Child was given to me 10 minutes after delivery but I breastfed after 24 hours because no milk was coming. Another woman's mother-in-law told us to give sugar water but we thought child will catch cold, so my mother gave cow's milk. Milk gives strength to the child. (SC, educated up to Class 5)

As shown in Figure 4.4, in qualitative study also it was observed that fewer women gave prelacteal feeds if they initiated breastfeeding within one hour (7 out of 27). When initiation of breastfeeding was delayed, prelacteal feeds were often given (40 out of 65). Moreover, even when women delivered at an institution and initiated breastfeeding early, some of them (4 out of 7) gave prelacteal feeds because they were not aware that frequent feeding will produce milk. As one woman residing in a poorly developed village said:

> Nurse gave my child within one hour of delivery and said to breastfeed so I breastfed but no milk was coming at that time. I gave buffalo milk to my child using cotton. My mother-in-law told me to give buffalo milk. I did not know that if I continued to try breastfeeding milk would have come. (SC, illiterate)

Another woman who delivered at institution and expressed the breasts to see if milk was coming and when no milk was coming she gave pre-lacteal feeds. She said:

> When my child was given to me after half an hour, I washed my breasts and breastfed. My mother told me to breastfeed. No milk was coming. I expressed to see [ghad kar dheka] but no milk came so I had to give small amount of outside milk. If I had produced milk then I would not have given anything else. (High caste, illiterate)

Similar was the situation when they delivered at home asone of them said:

> I breastfed my child after half an hour but no milk was coming and the child was crying. We gave the child sugar water. The low caste women who cutscord [chamain] said that if milk is not coming to given sugar water. If mother's milk starts coming soon then there is no need to give sugar water. Sugar water is given so that child's stomach will be full otherwise child will start crying due to hunger. (SC, illiterate)

ASHAs also reported that children were given prelacteal food because women do not produce breast milk soon after birth (65 percent; N=212). Other reasons for giving prelacteal feeds, as revealed by the qualitative study, are that the child's throat will not get dry or will not catch cold or cough (5 out of 46), mother was having pain or bleeding and was feeling drowsy so could not breastfeed immediately (6 out of 46).

This further indicates the need to communicate that early and repeated breastfeeding will result in faster milk production. If early breastfeeding is established, practice of prelacteal feeding may reduce to a large extent.

Colostrum Feeding

The study findings show that practice of colostrum feeding has increased from 68 percent in 2007-08 (DLHS 3) to 77 percent in 2010-11 (PC). Colostrum feeding was high both among women who practiced early breastfeeding (87 percent; N=1,058) as well as those who delayed initiation of breastfeeding beyond one hour (71 percent; N=1,879). Moreover, there is also support from mothers-in-law on colostrum feeding, since 62 percent of them reported that colostrum should be fed to the child.

However, study findings showed significant difference in colostrum feeding among women who were illiterate (75 percent; N=1,455) and those who had secondary or higher education (84 percent; N=477). Colostrum feeding was higher among women who delivered at institutions (83 percent) compared to those who delivered at home (70 percent) and the difference is statistically significant (z test, $p<.001$). The difference is probably because higher proportion of women who delivered at institutions (46 percent) received advice to feed colostrum during pregnancy as compared to those delivered at home (27 percent). Further, about 69 percent were given advice to feed colostrum at the time of discharge from institutions (69 percent).

Qualitative study shows that 61 out of 75 women, who fed colostrum to their children, did so because they perceived that colostrum is good as it protects the child from illness; it has vitamins to protect the child from illness or colostrum keeps the child healthy. One woman from other backward caste (OBC) said:

> I fed first yellow milk to my child. Nurse had advised me to feed yellow milk. If this milk is fed the child keeps good health. (OBC, illiterate)

Another woman said:

> I fed first yellow milk to my child. My sister-in-law had said first yellow milk protects the child from all illnesses. Child gets nutritious food from this. (SC, educated up to Class 10)

Another woman who equated colostrum to be as good as formula milk said:

> I did not throw away first yellow milk instead I gave it to my child. With this milk the child will get strength and will grow fat. I am poor and I cannot buy formula milk for my child but I gave yellow milk so that the child will not become weak. (SC, illiterate)

Women who received advice from a family members or a health care provider like nurses or perceived that colostrum is good for the child often fed colostrum.

Exclusive Breastfeeding

The study shows that as reported by women, 42 percent of children aged 0-6 months of age were exclusively breastfed; 14 percentage point more than in NFHS-3 (2005-06). This percentage decreases to only 34 percent among children aged six months (N=149) who were exclusively breastfed for the first six months of their life. Seventeen percent of the children aged two months and 34 percent of children aged 3-5 months were started on supplementary feeds. Overall, 43 percent of children aged 6-23 months (N=1,795) were exclusively breastfed. Several campaigns have been held in Bihar on breastfeeding in the recent years. There has been emphasis by the health care providers that only breast milk should be fed till the child is six months old, however, the practice of exclusive breastfeeding is still very low and attention is needed to promote the behavior further. The analysis reveals that practice exclusive breastfeeding shows no difference by type of family – nuclear or joint, caste, religion, standard of living index, education of women, working status of women outside of home, place of delivery or exposure to media.

The study revealed that 24 hours prior to interview children aged 0-6 months (N=938) were given water (47 percent); animal or formula milk (30 percent) and semi-solid or solid food (7 percent). Almost all women interviewed (96 percent) reported that children should be given water before the age of six months. The reason for giving water is because child will be thirsty (87 percent); normally water is given to children (27 percent); because everyone gives water to children (17 percent) and helps in digestion (9 percent). Children were fed milk other than breast milk or semi-solid/solid food before the age of six months, because women felt breast milk alone would be inadequate for growth of the child or would be good for the child to give additional milk or other food (71 percent); breast milk produced was insufficient because the child kept crying even after breastfeeding (74 percent); elder members of the family advised to feed other food(5 percent) or because women were working outside of home so the child had to be fed other food or milk (3 percent).

Barrier to Healthy Breastfeeding Practices

Barriers to breastfeeding are given in Box 4.1 and described below:

Several reasons were mentioned by women for delaying breastfeeding. Of these women (N= 1,879), 45 percent knew that newborn should be breastfed within one hour but yet had delayed breastfeeding. The key reasons are shown in Figure 4.5.

Figure 4.5: Reasons for delay in initiating breastfeeding as reported by women (percent)

Source: Population Council, formative study, 2011.

Perception that Breast Milk is not Produced Immediately After Delivery

The main reason of delay in early breastfeeding, as shown in Figure 4.5, is because women felt no milk was coming soon after delivery (62 percent; N=1,879). This was the most common reason reported by women irrespective of whether they delivered at home or at institution. However, as shown in Figure 4.6, among women who delayed breastfeeding, significantly higher percentage (72 percent) who delivered at home compared those who delivered in institution (50 percent) reported that they delayed breastfeeding because they were not producing breast milk (z test, $p<.001$). This indicates that early breastfeeding is promoted more at institutions.

Box 4.1: Barriers to early and exclusive breastfeeding

Ind ividual /family/community
Delay in breastfeeding • Perception that breast milk is not produced immediately • Post delivery cleaning of mother and child took time • Mother feeling unwell to sit up and breastfeed • Low or no perceived benefit of early breastfeeding
Prelacteal feed being given • Perception that breast milk is not being produced • Honey and milk give strength to the child • Delay in initiating breastfeeding
Colostrum not fed because • It is thick and cannot be digested , spoils child's stomach

- Colostrum is stagnant milk produced in the nine months of pregnancy period
- Colostrum makes the baby drowsy

Water is fed within three months because

- Child is thirsty and throat will dry up, especially in summers
- Water is good for the child- for digestion and growth
- Child should be habituated to drinking water from a young age otherwise sudden initiation water may cause cold and cough

Child not exclusively breastfed

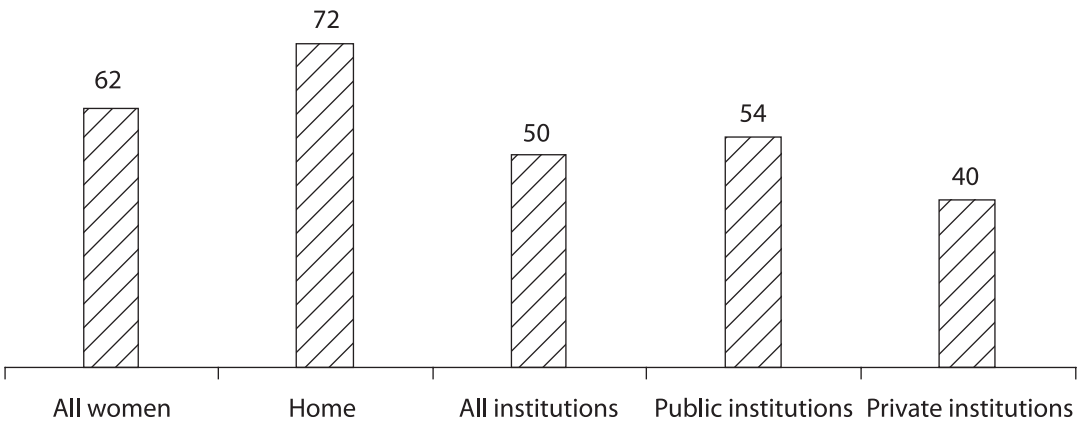
- Belief that child is hungry when he/she cries
- Lack of knowledge that breast milk is adequate for children till six months of age
- Lack of knowledge of proper breastfeeding practice

System level

- Lack of knowledge of advantages of early breastfeeding
- Lack of knowledge about composition of breast milk
- Post-delivery cleaning takes time at the institutions
- Women not facilitated to breastfeed when they are feeling weak
- No counseling aids

Source: Population Council, formative study, 2011.

Figure 4.6: Perception that breast milk is not produced immediately after delivery as a reason for delaying breastfeeding by place of delivery (percent)



Source: Population Council, formative study, 2011.

Moreover, even women who knew that newborn should be breastfed within one hour but still delayed breastfeeding (N=1,809), 47 percent delayed because they felt they were not producing any breast milk. The qualitative study also showed that 32 out of 66 women who delayed early breastfeeding reported that they could not breastfeed within one hour because they were not producing any milk soon after the delivery. A woman who delivered at home said:

> I breastfed only after four hours because I started producing milk only four hours after delivery. The child was made to lie down next to me soon after delivery, but because no milk was coming, I did not breastfeed within one hour. I did not try to breastfeed within one hour and dai had told me to breastfeed when the milk starts coming. (OBC, illiterate)

The ASHAs also mentioned women not producing milk immediately as a reason for delay in early breastfeeding. As one of them said:

> Breastfeeding should be initiated within one hour but after delivery milk does not come because it is dried up and therefore women are not able to breastfeed immediately. (SC, educated up to Class 8)

The perception that mothers do not produce breast milk soon after delivery is high among women, elder women and frontline health workers. Therefore, along with building capacity of frontline health workers every opportunity that arises during their antenatal period or at the time delivery needs to be utilized to inform and counsel women about early breastfeeding.

Post-Delivery Cleaning Takes Time

One-fourth of the women (25 percent; N=1,879) who delayed early breastfeeding reported longer time taken to clean up mother and child was the reason for delay in initiating breastfeeding (Figure 4.5). There is no significant difference between women reporting post-delivery cleaning as a reason to delay among those who delivered at home (25 percent) and institution (26 percent). However, qualitative study showed that cleaning the child is important before breastfeeding otherwise they are considered dirty and polluted. In case of home deliveries, the umbilical cord is cut by a woman from scheduled caste called *chamayin* or *dagrin* or *dai*. They are called home when woman starts labor but sometimes they reach after the woman delivers. In such circumstances the families wait for her to come and cut the cord, remove the placenta and then start cleaning up, all of which takes time. In the qualitative study also 13 out of 66 women who delivered at home said they could not breastfeed early because cleaning up took time. As one woman who delivered at home reported:

> I breastfed my child after two hours because it took time to bathe the child. My mother-in-law said that till the child is bathed breastfeeding should not be started because all the dirt will get into the child's mouth. Nobody else told me to breastfeed, only mother-in-law said. Nobody told me the benefits of early breastfeeding. (SC, illiterate)

Longer time taken to clean up as a reason for delay early breastfeeding in case of home deliveries compared to institutional deliveries was also reported by community based health workers in the qualitative study. One AWW said:

> Within one hour women do not breastfeed because they are lying in dirt. They breastfeed after they are cleaned up. Cleaning up can take 2-3 hours. Women who deliver at hospital feed within one hour because they are clean up fast in the hospital. (OBC, educated up to Class 10).

Such delays in cleaning up also occur at the institutional settings. A woman who delivered at institution said:

> I breastfed my child after two hours. How can anyone immediately give the child to the mother before wiping and cleaning the child? No one told me that if the child is breastfed early milk will come. My mother-in-law herself does not know and no health worker told me. I do not know ASHA. (High caste, illiterate)

This indicates the need for strengthening supporting supervision of the health care providers in breastfeeding. Delay in cleaning up after delivery at institutional settings could be reduced since the health care providers are present at the time of delivery.

Mother Feeling too Weak to Breastfeed After Delivery

Feeling too weak after delivery due to pain and exhaustion was a reason for delay in early breastfeeding, as reported by several women (18 percent; N=1,879). Analysis shows among those who gave this reason, significantly higher percentage of them had delivered at an institution (24 percent) compared to home (13 percent) (z test, $p<.01$).

Qualitative study showed that some women (14 out of 66) did not breastfeed their child within one hour because they themselves were not feeling well. Only two women had complicated delivery. For example one woman said:

> The child was given to me 20 minutes after delivery. I was having pain in the abdomen so only after two hours I started breastfeeding my child. I could not get up because of pain. Two hours after delivery the child started crying and then I breastfed. I know that the child should be breastfed within one hour after delivery but I myself was in discomfort so how could I take care of the child. (High caste, educated up to Class 10) (Aruldas et al., 2012, p. 102)

A woman who delivered in an institution said:

> I breastfed my child only after one and half hours after delivery because my back was paining. I told the nurse that my back was paining and she said to just lie down for 10 minutes and it will be alright. So I was lying down and only after one and a half hours I got up to breastfeed my child. (OBC, educated above Class 10)

Some women need support to help them initiate breastfeeding after delivery. This barrier can be reduced if health care providers and family members are made aware that they could play a supportive role in getting women to breastfeed early. Especially at public institutions this could be easily addressed through sensitization of ASHA and *Mamta,* since many women reported weakness as a reason to delay breastfeeding though they had normal delivery.

Baby not Given to Mother Immediately or the Child was not Crying for Feeds

The findings show that sometimes women delayed early breastfeeding because the child was quiet

or sleeping and not crying for feed (7 percent; N=1,879). This was also reported in qualitative study (5 out of 66). One woman said:

> The child was given to me five minutes after delivery. I breastfed only after two hours because my child had gone to sleep. When ASHA told me to breastfeed, the child was just waking up and I breastfed. (OBC, illiterate) (Aruldas et al., 2012, p. 103)

Another woman said:

> Within 30 minutes of delivery the child was wiped and cleaned with oil and given to me wrapped in a cloth. The child was not crying so I breastfed only after one hour when the child started crying. If the child had been crying I would have breastfed. I know that milk will start coming when the child suckles on the breast but I did not try to breastfeed in one hour. Child was sleeping peacefully. If the child was hungry he would have cried and I would have breastfed. (OBC, illiterate)

This indicates that women are not aware of the benefits of early breastfeeding. BCC strategy could address not only women in the communities but also frontline health workers, that newborn should be put to breast to suckle within an hour even if they are not hungry for feeds.

Lack of Knowledge About Timing of Initiation of Breastfeeding

Nearly two-thirds (62 percent) of total women (N=2,937) interviewed reported that newborn should be fed within one hour of birth. However, only half (53 percent) of those who correctly knew about early breastfeeding (N=1,809) also practiced it. Women who did not know that a newborn should be fed within one hour of birth (N=1,128), 92 percent of them delayed initiation of breastfeeding. A woman with four children who delivered in an institution said:

> Child was given to me soon after delivery but I did not breastfeed because no milk was coming. When the milk comes the mother feels feverish. I tried to breastfeed only after four hours. I did not know that if breastfeed early the milk will be produced early. No one told me anything because I know about breastfeeding since this was my fourth child. (SC, illiterate) (Aruldas et al., 2012, p. 102)

This indicates that knowledge of newborn should be breastfed within one hour of delivery is an important factor that facilitates early breastfeeding. Elder women in the family often advice younger women in child feeding practices. The study showed that only 50 percent of the 712 mothers-in-law reported breastfeeding should be initiated within one hour of delivery. Husbands, whose advice is often considered in family matters, were very poorly informed about early breastfeeding. Only 4 percent of 723 husbands reported that breastfeeding should be initiated within one hour of delivery. This indicates that BCC strategy for breastfeeding practices should address also the family members other than women.

Lack of Knowledge About Advantages of Early Breastfeeding

The findings show that though 62 percent of all women (N=2,937) knew that newborn should be fed within one hour of birth they were unaware about the key advantages (Table 4.2) of early breastfeeding such as if breastfed early breast milk will start coming fast (23 percent); helps in child survival (10 percent) and helps in reducing postpartum bleeding (3 percent). Only about one-third (31 percent) knew that suckling by the newborn triggers production of breast milk and no one mentioned that only after feeding completely from one breast must switch to the next breast. The level of knowledge about advantages of early breastfeeding was equally low even among the elderly women in the communities. Further, Table 4.2 shows that knowledge about advantages of early breastfeeding among ASHAs (N=212) was if breastfed early breast milk will start coming fast (30 percent); helps in child survival (28 percent) and helps in reducing postpartum bleeding (11 percent). Thus knowledge of ASHAs is also limited who belong to the same community as the women and are expected to promote early breastfeeding. Therefore, capacity building of ASHAs would be required if knowledge level among women in the communities has to be raised.

Table 4.2: Advantages of early breastfeeding, as reported by women, mothers-in-law and ASHA (percent)

Advantages	Women	Mothers-in-law	ASHA
Milk will start coming early	22.5	24.2	29.7
Helps in child survival	10.1	12.4	28.3
Prevent excessive postpartum bleeding	2.6	2.7	10.8
Keeps mothers breast light	30.8	27	26.9
Keeps the child healthy	55.7	47.3	83.0
Do not know	15.1	—	2.8
Total	**2,937**	**712**	**212**

Source: Population Council, formative study, 2011.
Note: Percentage add to more than 100 due to multiple responses.

Lack of Knowledge About What Causes or Helps Production of Breast Milk

Only about one-third (31 percent) of women interviewed knew that suckling by newborn is an important triggering factor for breast milk production (Table 4.3) and similar was the level of knowledge if the mothers-in-law (34 percent). The level of knowledge among ASHAs was better (47 percent) than the family members, but still is low. When ASHAs counsel women on early breastfeeding soon after delivery, one of the crucial information they should give is that when the child suckles breast milk will be produced.

Table 4.3: Factors that cause or help in production of breast milk, as reported by women, mothers-in-law and ASHA (percent)

Advantages	Women	Mothers-in-law	ASHA
When woman eats nutritious food	81.9	83.0	76.4
When child suckles milk will be produced	31.2	34.1	47.2
When breasts become heavy milk starts coming	16.7	13.1	8.0
When woman feels feverish milk will start coming	16.6	13.9	—
Do not know	4.1	2.8	6.1
Total	**2,937**	**712**	**212**

Source: Population Council, formative study, 2011.
Note: Percentage add to more than 100 due to multiple responses.

Misperceptions Among Frontline Health Workers about Practice of Early Breastfeeding in the Community

Most of the ASHAs (80 percent; N=212), AWWs (81 percent; N=243) and ANMs (72 percent; N=137) reported that most women in their community initiated breastfeeding within one hour of delivery. This indicates that they were not aware of actual level of early breastfeeding in their communities. Among those who said that women in their communities delay initiation of breastfeeding beyond one hour, many (39-42 percent) reported that this was because milk does not come in mother's breast soon after delivery (45-63 percent); post-delivery cleaning of mother and baby takes time (37-57 percent); women feels too weak to hold baby or due to delivery complications (31-56 percent) and women do not have the knowledge (17-22 percent).

Such misperceptions about the level of practice in the community result in limited efforts by frontline health workers to promote and reinforce the desired practice. Frontline health workers are required to be informed about the actual extent of the practice in the community and provided with supportive supervision so that they can actively promote early initiation of breastfeeding.

Other Reasons for Delay in Early Breastfeeding

The study shows that largely, there were no traditions and customs observed in rural Bihar involved in initiation of breastfeeding. However, in the qualitative study one woman from a Muslim community in Saidpur village of Patna district who delivered in an institution reported that she had to follow a ritual called *'Faatiah'* which is reading of Holy Koran, so she could not breastfeed within one hour. She said:

> I breastfed my child only the next day because [Faatiah] Holy Koran reading had to be performed. If breastfed before that nothing happens but this is the ritual we follow. My brother is educated and he said that the child should be breastfed within one hour. (High caste, illiterate)

Such rituals were not mentioned by other Muslim women from other villages; therefore rituals for initiating breastfeeding did not appear as a major issue in Bihar.

Missed Opportunity to Promote Early Breastfeed ing by Local Private Practit ioners

Study show that among 1,359 women who delivered at home, nearly half of them (49 percent) had received injections at the time of delivery mostly from village-level private practitioners and a few from ANMs. Advice by village-level private practitioners, though they do not stay till delivery, to initiate breastfeeding early is clearly a missed opportunity. Involving private practitioners could be of particular importance in remote villages where women opt for home deliveries.

Perception that Colostrum is Bad for the Child

About one-fourth (23 percent; N=2,937) of women did not feed colostrum. The reasons for discarding colostrum as explored in the qualitative study (Table 4.4) revealed that most women (14 of 18) who did not feed colostrum perceived that yellow milk is dirty or bad because it is the

Table 4.4: Reasons for discarding colostrum as reported by women interviewed in qualitative study

Reason for discarding colostrum	Number
Child cannot digest yellow milk and can have diarrhea or harm the child or fall sick	14
Women in the village do so or they say that the first milk should be given to 'dharti ma' so I got scared	2
Child feels drowsy (*nasha*) after yellow milk	2
Total	**18**

Source: Population Council, formative study, 2011.

milk that has been stagnant for nine months during pregnancy; can cause stomach pain or diarrhea or will harm the child and make the child sick. For example, one woman narrated:

> I did not feed first yellow thick milk to my child. I discarded it because it causes harm, it gives stomach pain. (High caste, educated up to Class 5)

Similarly, two women discarded colostrums because other women in the village discarded or heard them say that this milk should be given to *Dharti ma* (God earth) otherwise child could be harmed and therefore feared that colostrum may harm the child. They had discarded it on the ashes or on the door to prevent anyone from stepping on it. They believed that if someone stepped on the breast milk then the mother will not produce adequate amount of milk. Women fear that yellow milk may harm the child when family members say so even though they may have been advised by the health care providers. For example, one woman observed:

> My mother-in-law said to wash the breasts with warm water and discard the bad milk and throw it on the door [kivaad] of the house. If it is just thrown on the ground then someone could step on it and the breast milk will dry up and child will not get mother's milk. If first milk is not discarded, then bad milk will go into the mouth of the child. I do what my mother-in-law says. The ASHA had told me to feed the first milk to the child but my mother-in-law said to discard it so I discarded it." (High caste, educated up to Class 5)

Another woman who was advised by *dai* about colostrum said:

> When the milk started coming, I expressed and discarded it on the ash. [Dai] advised me to discard. She said not to throw the milk on the ground. I do not know why she said not to throw on the ground. [Dai] said yellow milk is bad and the child will not be able o digest it. My mother also had told me that the first milk is thick. So I discarded the first milk. (OBC, illiterate)

A few women (two) however believed that colostrum cause drowsiness [*nasha*] and so the child sleeps a lot after drinking colostrum. This perception was mostly reported from Khagaria. One woman reported that she was also advised by ASHA that colostrum will cause drowsiness. She said:

> I did not feed first yellow milk to child. ASHA said to wash the breasts and discard the yellow milk and then feed the child because yellow milk causes drowsiness [nasha chhaa jaata hai]. (OBC, illiterate)

Few women (7) who delivered at institutions also did not feed colostrum because they too believed that yellow milk is bad and the child could have diarrhea or could get drowsy. Four of them were illiterate and one of them was wrongly advised by an ASHA that colostrum will cause drowsiness and others mentioned that no one advised them about colostrum.

Mothers-in-law who believed that colostrum should not be fed (14) also perceived that colostrum harms the child, one of them said:

> I said to discard the yellow milk because it harms the child. I have not seen any harm but child cannot digest so we discard the colostrum. (OBC, illiterate)

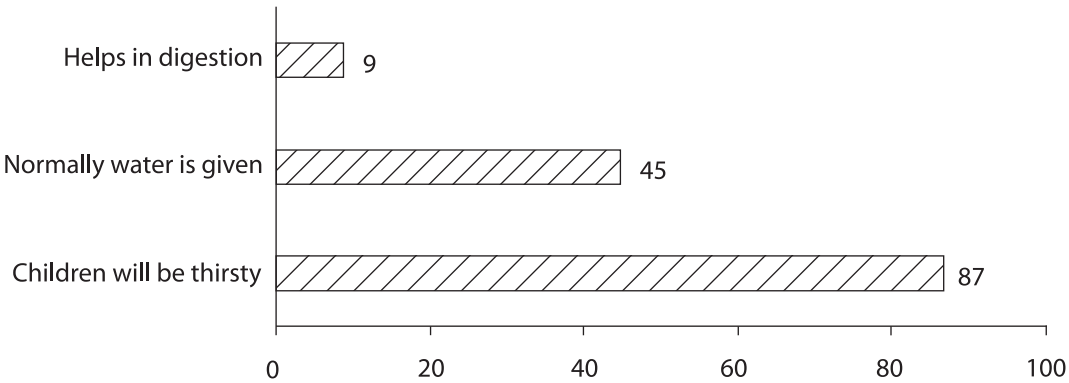
These findings indicate that women and their family members in rural Bihar have myths and misconceptions about feeding colostrum. Some of the health care providers like ASHAs also share the same view. Therefore, reorientation of frontline health workers and messaging and counseling women and family members about colostrum also required to be sustained.

Perception that Children Below Six Months of Age Need Water or Other Supplementary Feeds

Almost all mothers (96 percent) believe that water should be given to children below six months of age. About one-third (30 percent) of women reported water should be given by 0-3 months of age.

Those who reported that water should be given to children less than six months of age (N=2,819), most reported so because they felt that the child would be thirsty (87 percent); normally water is given or because everyone gives water (45 percent); helps in digestion (9 percent) (Figure 4.7).

Figure 4.7: Reasons for giving water to the child before six months of age as reported by women (percent)



Source: Population Council, formative study, 2011.

Findings also show that women and their family members do not know that there is water in the breast milk. Only 17 percent among all women (N=2,937) and mothers-in-law (N=712) interviewed reported that there is water in breast milk. Qualitative study also revealed that women fed water mainly because they perceived that child would be thirsty since it was summer, water gives "strength", "clean the stomach" and "improves blood" or 'because child would get used to water and will not catch cold'. They said:

> I am feeding only breast milk to my one month old child. Nothing else I am feeding, I give little bit of water. I am giving water from when the child was eight days old. Neighbor lady had told me that in summer children should be given some water, therefore I also gave water to my child, and maybe he is feeling thirsty. (SC, educated up to Class 10)

> I feed 1-2 drops of water to my three months old child. Neighbor women and mother-in-law told me to feed some water. Feeding water is beneficial, 'child will get used to drinking water', 'help in digestion' and 'will not catch cold'. (OBC, illiterate)

Family members like mothers and mothers-in-law advise women about feeding water to children. Women and their family members need information that water in the breast milk is adequate for children up to six months of age. Qualitative study also revealed that women gave animal milk because that though 'breast milk was inadequate for the child'. As one woman reported:

> My child's stomach was not getting full with my milk so he used to cry. Then I started giving cow's milk along with my milk. My milk is not enough for him and he starts crying. (SC, illiterate)

Another woman said:

> I did not produce enough breast milk so my child used to cry of hunger and I had to start giving cow's milk from the time child was 20 days old. When milk is produced in the breasts, the breasts feel heavy but when they feel light and are shrunk [sikud jathi jai] then we know that there is no milk. (SC, educated up to Class 10)

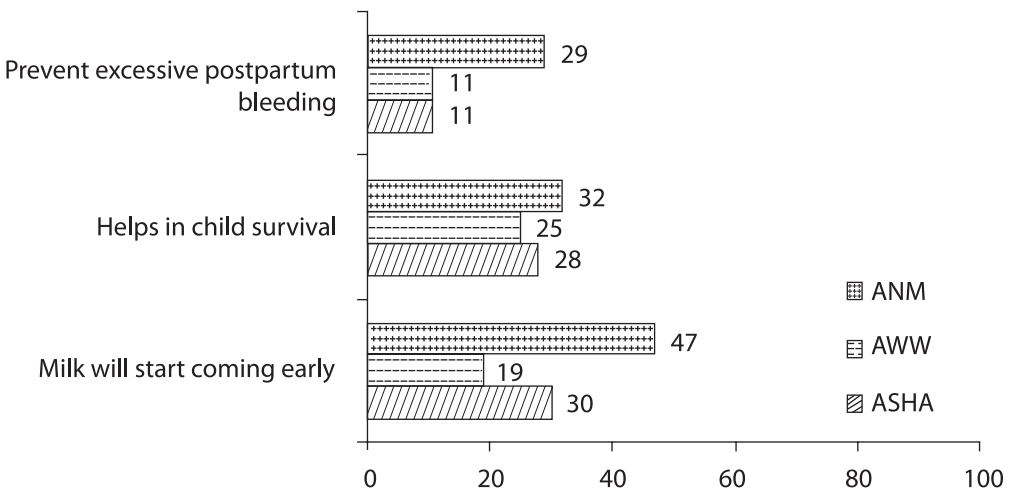
Perceptions of women that they are not producing enough breast milk is likely because child often can get distracted easily while being breastfed and stop sucking. This could make the women think that child stomach is full when actually it is not so. Child would then cry a little while later which could make women perceive that their breast milk was insufficient. Further, less the child sucks less will be amount of breast milk produced.

Lack of Knowledge Among Frontline Health Workers

About Advantages of Early Breastfeeding

Figure 4.8 shows the advantages of early breastfeeding as reported by frontline health workers – ASHAs, AWWs and ANMs. Specific benefits reported were milk will start coming early (20-47 percent); helps in child survival (25-32 percent) and prevent excessive postpartum bleeding (27-28 percent).

Figure 4.8: Advantages of early breastfeeding as reported by frontline health workers (percent)



Source: Population Council, formative study, 2011.

About Water Content in Breast Milk

Most of the frontline health workers (ASHAs, AWWs and ANMs) reported that there is water in breast milk but only 4-7 percent of them said that 75 percent of breast milk is water. About 63-65 percent of ASHAs and AWWs correctly reported that children should be given water after they are six months old. Still many of them (19-24 percent) perceived that water should be given to children before they are six months old. Qualitative study also revealed that many ASHAs (10 out of 36) and AWWs (12 out of 41) were not aware of correct age of six months for introducing water to children. They believed that water should be given 'when child is about 2-3 months old' and some even said water should be given from 'birth'. One of the ASHAs said:

> From the age of 2-3 months child should be given some water because the child's throat gets dry and falls sick. In summer more and in winter less water should be given. (SC, educated up to Class 10)

One AWW said:

> If it is summer then water can be given to the child from the age of one and half months and if it is winter then water should be given after four months of age because the child feels thirsty. (OBC, educated up to Class 10)

The findings show that most frontline health workers are unsure about how much water there is in breast milk and many are not sure if it is adequate for children less than six months of age. Strengthening knowledge of health workers in exclusive breastfeeding is critical. Therefore information to frontline health workers could be part of the BCC strategy.

Low Level of Counseling and Lack of IEC Materials

Few ASHAs reported that their role as an educator and counselor of early and exclusive breastfeeding (10-18 percent). Strengthening ASHAs in counseling for all aspects of breastfeeding is a critical element especially in areas where women have very limited access to mass media like newspaper, TV or radio. The study shows that 84-88 percent of the women did not read newspaper or watched TV or listened to radio. Table 4.5 shows that only around 4-23 percent of frontline

Table 4.5: Type of IEC/counseling aids available on breastfeeding, as reported by frontline health workers (percent)

Advantages	ASHA	AWW	ANM
Pamphlets/ leaflets	3.7	14.8	16.0
Posters	4.7	22.6	19.7
Flipcharts	3.3	12.7	3.6
Booklets/Modules	16.5	41.5	21.9
Total	**212**	**243**	**137**

Source: Population Council, formative study, 2011.

health workers reported that they had IEC/counseling aids like pamphlets/ leaflets, posters or flipcharts. Counseling would be more effective when appropriate counseling aids are used, therefore, all frontline health workers need to be equipped with counseling aids and encouraged to use them.

Facilitating Factors for Breastfeeding Practices

As revealed by the study, there are many facilitating factors for early and exclusive breastfeeding. These factors are given in box 4.2 and discussed in this section.

Early Breastfeeding

Background characteristics: The background characteristics of women (Table 4.6) like religion, caste, type of family, SLI and education of woman are significantly associated with early breastfeeding. The logistic regression analysis (Table 4.7) for early breastfeeding shows that background characteristics like caste, SLI and parity of women or gender of the index child did not have any significant effect on practice of early breastfeeding. However, analysis shows that the likelihood of early breastfeeding was higher among women from Hindu religion compared to non-Hindu (OR=1.75, p<.01), joint family compared to nuclear family (OR=1.23, p<.05), who had secondary or higher education compared to no education (OR=1.44, p<.05).

Table 4.6: Background characteristics of women on early and exclusive breastfeeding

Variable	Category	Early breastfeeding		Exclusive breastfeeding	
		Percent	Total	Percent	Total
Religion	Hindu	38.7**	2,427	43.3	1,498
	Non-Hindu	23.3	510	43.1	297
Caste	SC/ST	34.9	716	42.9	1,362
	General caste	39.5*	2,221	44.3	433
Type of family	Nuclear	31.6	1,406	44.6	852
	Joint	40.1**	1,531	42.0	943
Standard of living index	Low	31.8	1,088	45.5	690
	Medium	37.8	1,364	41.0	808
	High	40.6**	485	44.1	297
Education of women[1]	No education	33.4	1,952	43.1	1,180
	Primary	34.3	388	46.2	238
	Secondary or higher	45.9**	597	41.9	377

(Table 4.6 Continued)

(Table 4.6 Continued)

Variable	Category	Early breastfeeding		Exclusive breastfeeding	
		Percent	Total	Percent	Total
Contact with ASHA	No	30.9	1,270	39.7	766
	1-2 contact	36.3	787	45.4	471
	3 or more contact	43.1**	880	46.2*	558
Received advice on early breastfeeding	No	24.6	1,380	—	—
	Yes	46.1**	1,557	—	—
Received advice on exclusive breastfeeding	No	—	—	41.2	1,188
	Yes	—	—	47.1*	607
Place of delivery	Home	26.9	1,359	41.1	810
	Private institution	28.0	336	35.8	201
	Public institution	48.2**	1,242	47.3*	784
Parity of women	4 and above	36.4	976	43.5	543
	3	38.0	635	42.8	397
	2	37.6	692	43.6	452
	1	33.3	634	42.9	403
Gender of the last child	Female	36.1	1,357	42.4	977
	Male	36.0	1,580	44.3	818
Type of delivery	Assisted or cesarean	22.5	204	40.8	125
	Normal	37.0**	2,733	43.4	1,670
Exposure to any mass media[2]	No	35.5	2,520	43.1	1,549
	Yes	39.1	417	44.3	246
Availability of a government health facility	Outside village	35.2	2,666	41.8	1,628
	Within village	43.9**	271	56.9**	167
Village size	<1000	38.1	176	31.2	109
	1001-3000	34.9	919	43.6	580
	3001-5000	35.4	551	43.0	344
	>5000	36.8	1,291	44.8	762
Presence of SHG in the village	No	39.3	1,331	41.6	805
	Yes	33.3	1,606	44.5	990

Source: Population Council, formative study, 2011.
***Note*:** Analysis based on last birth of currently married women aged 15-34 years who had given birth in the three years preceding the survey.
[1] Primary education =1-5 years of education; secondary education =6-12 years of education; higher education =13 or more years of education.[2] Mass media = Television, radio or newspaper.
χ^2 test; *p <.05; **p<.01.

Programmatic factors: Women who received advice on early breastfeeding (OR=2.07, $p<.01$), delivered in an institution (OR=1.75, $p<.01$) and had normal delivery (OR=2.36, $p<.01$) were twice more like to practice early breastfeeding compared to those who did not receive any advice on early breastfeeding, delivered at home and had assisted or caesarean delivery. Other factors like contact with ASHA, exposure to mass media, availability of a government health facility within the village, size of the village and presence of self health group (SHG) or *mahila mandals* in the villages were not statistically significant in influencing early breastfeeding (Table 4.7).

Box 4.2: Facilitating factors for breastfeeding practices

Correct knowledge among women and family members that
• Suckling stimulates breast milk production • Prelacteal feeds need not be given • Breast milk and colostrum have protective effect and are like first vaccination • Breast milk has enough water for a baby till six months of age
Other facilitating factors
• Receiving advice from family members • Receiving timely advice and help from *Mamtas* and ASHAs to initiate breastfeeding. • Media exposure

Source: Population Council, formative study, 2011.

Exclusive Breastfeeding

Background characteristics: As shown in Table 4.7, background characteristics of women like religion, caste, type of family, SLI, education of woman and parity of women or gender of the index child do not significantly affect the practice of exclusive breastfeeding.

Programmatic factors: Women who belong to a village that had a government health facility within the village (OR=1.84, $p<.01$) and with population larger than 5,000 (OR=1.78, $p<.05$) were twice more likely to practice exclusive breastfeeding compared to those who live in village that does not have a government health facility or are small in size with less than thousand population. Women who received advice on exclusive breastfeeding were more likely to practice it compared to those who did not receive advice (OR=1.24, $p<.05$). Other factors like contact with ASHA, exposure to mass media, and presence of SHG or *mahila mandals* in the villages were not significant in increasing likelihood of influencing exclusive breastfeeding (Table 4.7).

The qualitative study, as discussed below, also revealed that receiving advice from family members and health care providers, exposure to mass media and having knowledge are important facilitating factors for early and exclusive breastfeeding.

Child remains healthy or will not fall sick or will get vitamins if fed immediately: Women who breastfed within one hour, irrespective of delivery at institution or home, did so mainly

because they perceived that if fed early their child would remain healthy or will not fall sick or will get vitamins immediately (12 out of 27). Half these women (6) were illiterate yet they perceived early breastfeeding would be good for the child and so they breastfed. A woman, who delivered in institution and was counseled and supported by her sister-in-law, *Mamta* and ASHA, said:

Table 4.7: Results of the logistic regression analysis on early and exclusive breastfeeding

Variable	Category	Odds Ratio	
		Early breastfeeding	Exclusive breastfeeding
Religion	Non-Hindu®		
	Hindu	1.75**	1.00
Caste	SC/ST®		
	Other Backward Caste	0.81	0.95
	General caste	1.09	0.92
Type of family	Nuclear®		
	Joint	1.23*	0.92
Standard of living index	Low®		
	Medium	1.17	0.82
	High	1.10	0.95
Education of women[1]	No education®		
	Primary	0.93	1.17
	Secondary or higher	1.44*	0.94
Contact with ASHA	No®		
	1-2 contact	0.96	1.18
	3 or more contact	1.15	1.18
Received advice on early breastfeeding	No®		—
	Yes	2.07**	—
Received advice on exclusive breastfeeding	No®	—	
	Yes	—	1.24*
Place of delivery	Home®		
	Private institution	0.79	0.77
	Public institution	1.75**	1.21
Parity of women	4 and above®		
	3	1.00	0.94
	2	1.04	1.00
	1	0.93	1.02
Gender of the last child	Female®		
	Male	1.04	0.93

(Table 4.7 Continued)

(Table 4.7 Continued)

Type of delivery	Assisted or cesarean®		—
	Normal	2.36**	—
Exposure to any mass media[2]	No®		
	Yes	0.96	1.06
Availability of a government health facility	Outside village®		
	Within village	1.30	1.84**
Village size	<1000®		
	1001-3000	0.95	1.78*
	3001-5000	0.93	1.72*
	>5000	1.11	1.78*
Presence of SHG in the village	No®	—	
	Yes	—	0.99
Total		**2,937**	**1,795**

Source: Population Council, formative study, 2011.
Note: Analysis based on last birth of currently married women aged 15-34 years who had given birth in the three years preceding the survey.
[1] Primary education =1-5 years of education; secondary education =6-12 years of education; higher education =13 or more years of education.
[2] Mass media = Television or radio or newspaper.
Dependent variable: Initiated breastfeeding within one hour of birth (Yes=1, No=0); children aged 6-23 months exclusively breastfed (Yes=1, No=0).® Reference category; * p <.05; ** p<0.01.

> Child was given to me half an hour after delivery and I breastfed immediately. No milk was coming but watery fluid was coming but I continued to feed because if the child's stomach will be full and child will be healthy if breastfed. My sister-in-law, mamta and ASHA helped me to breastfeed. (SC, illiterate)

Another illiterate woman with three children who delivered at home and breastfed early reported:

> I washed my breasts and breastfed my child within one hour because if you feed immediately the child will get vitamins and will not fall sick. Dai asked me to breastfeed and I had heard on radio that the child should be breastfed within one hour. No health care provider told me anything about breastfeeding but I had heard it on radio. (OBC, illiterate)

This indicates that women who have the information about correct breastfeeding practices and are supported by family members and health care providers are likely to adopt the practice.

If breastfed early breast milk will come early: Few women (eight out of 27) had correct knowledge and reported that they breastfed early because if the child is breastfed early milk will start coming early. A woman said:

> I breastfed my child half an hour after delivery. Milk was not coming but I knew if by breastfeeding milk will start coming. Initially the milk is very watery but still I breastfed because then milk will start coming. My sister-in-law had told me this. (High caste, educated up to Class 5)

Another woman said:

> Child was given to me after half an hour and I tried to breastfeed but no milk was coming. I knew that as the child keeps on sucking milk will start coming so I breastfed. My mother-in-law told me that when the child tries to catch mother's milk, milk will start coming. (SC, illiterate)

While talking about early breastfeeding and early milk production, few women reported that if women ate what is called *doodh masala* (milk containing spices like ginger, sugar, *ajwain* and *mangri*) they would produce milk. For example women said:

> I breastfed my child half an hour after delivery but not much milk was coming because I had not taken the [doodh masala]. [Doodh masala] is made at home by women of all castes in the village which should be taken early in the morning in an empty stomach. When women eat [doodh masala], milk starts coming fast. I know this because everyone eats it. (SC, educated up to Class 10)

Women who correctly had this knowledge that early breastfeeding will enable milk production were mainly from Khagharia and Purba Champaran districts. These were young illiterate (5) women in the age group 15-24 years with two or three children and delivered in an institution (7 out of 8). They were informed by family members like sisters-in-law, and mothers-in-law that if breastfed early milk will be produced. These findings indicates that it is essential for women have knowledge that early breastfeeding leads to quicker milk production. However, very few women have this knowledge and this is a critical information gap that needs to be incorporated in communication strategies.

Family members are key facilitators: The qualitative study also shows that elderly women like mothers-in-law and mothers and sometimes older sisters-in-law played the role of facilitators. A woman who was delivered by her mother-in-law at home (mother-in-law was also a *dai*) said:

> I breastfed my child 25 minutes after delivery. My mother-in-law said to make sure that nipple is properly placed in the mouth of the child, only then child will be able to drink properly. She also said to feed from one breast and when that is empty only then feed from next breast. (OBC, illiterate)

Mothers-in-law perceived that by breastfeeding 'immediately' child's stomach will be full and keep well. Mothers-in-law believed that child should be breastfed immediately (20 out of 47) but 'immediately' meant anytime within 1-2 hours and not necessarily always within one hour. For example:

> I told my daughter-in-law that breastfeeding 'immediately' is very beneficial, child will be protected from diseases. I knew that child should be breastfed within 1-2 hour of birth. I had heard this from TV and radio. Also there is a photo [poster] hanging in government hospital which says that child should be breastfed immediately. My daughter-in-law breastfed in two hours. Breastfeeding in two hours is good. (SC, illiterate) (Aruldas et al., 2012, p. 106)

Most mothers-in-law (29 out of 47) said colostrum should be fed to the child because they have heard that colostrum gives strength, for example:

> Earlier everyone used to discard yellow milk because they used to say that it will harm the child but now we see on TV and hear on radio that yellow milk should be fed because it gives strength. I told my daughter-in-law to feed yellow milk. (OBC, illiterate)

Husbands, though played very limited role in helping women to initiate breastfeeding could influence breastfeeding practices within the family. Two women reported that their husbands told them to breastfeed though after one hour of delivery. One of them said:

> I started breastfeeding within 15 minutes after delivery….my husband told me to breastfeed. (OBC, illiterate)

Thirteen husbands knew that breastfeeding should be initiated within one hour and seven of their wives initiated early breastfeeding but only one woman reported advice from her husband for early breastfeeding. They were often not aware of when their wives initiated breastfeeding (only 13 husbands correctly matched their wives with regards to initiation of breastfeeding). One of the husbands who were aware that breastfeeding should be initiated within one hour said:

> I do not know when my child was first breastfed but nowadays in news we hear that child should be breastfed within one hour so the child will not have any illnesses like polio and other illness. (SC, illiterate)

The information about breastfeeding need to reach husbands since very few husbands were aware of the timing and benefits of early breastfeeding. As one husband said:

> I do not know the advantages or disadvantages of breastfeeding within one hour, these things only doctors know. (High caste, educated up to Class 10)

Advice from health workers: Few women (7 out of 27) fed their child within one hour just because health care providers at institution told them how to feed the child and helped them. One woman who delivered at an institution said:

> The child was given to me half an hour after delivery and then after five minutes ASHA and nurse told me to breastfeed. Mamta helped to me wash my breasts and ASHA kept the child on my lap and Mamta helped to keep the nipple properly in my child's mouth. The child started sucking and while sucking the milk started coming. (High caste, illiterate)

This shows the credibility of health care providers as well as experienced family members who are present at the time of delivery and advice women on breastfeeding. It is therefore essential to provide supportive supervision to counseling on breastfeeding in health care setting and to involve and address elder family members in BCC strategy.

Very few women were advised by nurse (2) or AWW (1) but health care providers played major role in promoting exclusive breastfeeding. Women with 4-5 months old children who were not feeding water said:

> Nurse [memin] told me to feed only breast milk for six months, even water should be given only after six months. If the child is only breastfed it will not fall sick. I will give water only after my child becomes six months old. (High caste, illiterate)

Exposure to media: Mass media has also been a source of information to women about feeding colostrum though only for very few (4). Women reported that they knew from television or radio that colostrum should be fed to child. Women, who reported television or radio as a source of information, were mainly from Patna district. They said:

> I fed first yellow milk to my child, I did not discard it. I saw on television that colostrum should be fed to child. Child will be healthy if first yellow milk is fed. Outside milk will cause infection. Earlier I used to express and throw away first yellow milk but now from television and also from other women I know that yellow milk should be fed so I also started feeding. (High caste, educated up to Class 10)

> My sister-in-law had told me that first yellow milk should be fed to the child and I also heard this from television and radio. With this child will not fall sick and will be healthy. (SC, educated up to Class 9)

> I fed first yellow milk to my child. Heard about it from 'Kalyani program' [television channel]. I heard that this gives the child strength to fight diseases so I fed to the child. (OBC, illiterate)

One of the husbands who had seen a television program said:

> I do not know when my child was first breastfed and neither did I ask but I have heard on TV, kalyani program that the child should be breastfed within one hour. Child will not fall sick if breastfed early. I knew but I did not ask, this was a mistake. (High caste, educated up to Class 10)

One woman said that they heard about feeding colostrum in mothers' meetings. For example:

> I fed my child first thick milk because with breast milk, the child will not fall sick. The child will get vitamins and will be strong. I heard this in women's meeting which was held in the village. If yellow milk is not given the child will be weak. (SC, illiterate)

The power of messages reaching a woman increases when there is synergy in information from multiple sources like TV or radio, wall paintings or mothers' meetings, advice from health care providers and family members. As a 24 year old woman from a moderately developed village said:

> I breastfed my child within one hour after delivery. Nurse told me to try breastfeeding. My mother-in-law also said to breastfeed the child. Then I cleaned my breasts and started breastfeeding. On the wall of the hospital it was written that child should be fed within one hour. (High caste, educated above Class 10)

Women who got information through media (one each from TV and radio) were also desired to practice exclusive breastfeeding. As one woman said:

> I feed only breast milk to my child. Even water I do not give. I heard on TV that only after six months water and other food should be given to children. (SC, educated up to Class 7)

This indicates that women are likely to practice exclusive breastfeeding provided they have information which is from credible sources like mass media and health care providers.

Other reasons or benefits of early breastfeeding: The knowledge of benefits of breastfeeding to mother is very low. No woman mentioned that early breastfeeding causes decrease in postpartum bleeding. Interestingly, women reported that by breastfeeding early breasts will not become heavy (engorged) and will remain light. She said:

> If the mother does not breastfeed the child then she will have lot of problems. She will develop pain in the breasts and [doodh ke ghant] lumps and fever. (SC, illiterate)

Television has been a source of information on breastfeeding, as one woman said:

> Mother's milk is good for the child and also it keeps mother's breasts light. I came to know about this through television. (High caste, educated up to Class 10)

This knowledge is important to prevent breast engorgement and abscess formation and could be incorporated in BCC strategy.

Discussion and Implications for BCC Strategy

Early breastfeeding in rural Bihar has shown an increase but is still low at 36 percent. The practice of prelacteal feeding like cow's milk, sugar water and honey is high though declining over time at 59 percent and shows a negative correlation to time of initiation of breast feeding after delivery. More number of women who deliver at institutions practiced early breastfeeding and did not give prelacteal feeds. Colostrum feeding is very high and is almost a community norm (77 percent). Exclusive breastfeeding has shown an increase to 34 percent but efforts are required to increase adoption of the behavior.

The study identifies several barriers to early and exclusive breastfeeding in rural Bihar. Irrespective of place of delivery, as also reported by Aruldas et al., 2010, the main reason for women to delay initiation of breastfeeding is the perception that breast milk is not produced immediately after delivery. This was also the most common reason reported by frontline health workers. This is also the reason why many give prelacteal feeds. Other common reason for delaying breastfeeding is because post-delivery cleaning takes time and the child has to be cleaned before breastfeeding otherwise it is dirty and polluted. This delay is further compounded by delay in cutting the cord after birth in case of home deliveries; however, this time taken to clean up was also equally reported by women who delivered at the institution. Women are often exhausted and feel too weak to breastfeed soon after delivery. Sometimes child is not given to the mother to breastfeed because it was not crying of hunger. Such delays could be easily addressed, more so in the institutional

settings. There is low awareness among women and other elder women in their families like their mothers-in-law that immediate and repeated suckling is the prime factor for early production of breast milk. Moreover, many are not aware that early breastfeeding increases the chances of survival of newborn and is beneficial for mother as it helps to reduce postpartum hemorrhage.

Colostrum feeding was practiced by most women irrespective of their level of education or place of delivery. Women and family members perceive that colostrum protects child from illness and keeps the child healthy. Few who discarded colostrum were concerned that it could harm the child if fed because colostrum is thick and therefore the child may not able to digest it. There are two main barriers to exclusive breastfeeding. One is the perception among women and their family elders that feeding water to a child is necessary and beneficial as the child would be thirsty if not given water; water helps in digestion and a child should be habituated to drinking water from a young age otherwise sudden initiation of feeding water may cause cold and cough. Water is fed within three months birth and in many cases as early as six weeks. They are not aware that 80 percent of breast milk is water and it is adequate to quench the thirst of child till six months of age. Often frontline health workers are also unsure about water content in breast milk and some of them believe and advice to give water to children before six months of age. The second main barrier to exclusive breastfeeding is that women perceive that they do not have enough breast milk because child cries soon after breastfeeding and supplement with animal milk. Women need to give adequate time for the child to complete breastfeeding for which they have to breastfeed in a quiet place if possible, if not, it would lead to a vicious cycle of gradual decrease in breast milk due to less sucking.

Breastfeeding practices are not service dependant behaviors and hence with appropriate counseling aids and supportive supervision ASHAs could be very effective in promoting the adoption. Although frontline health workers are considered a credible source of information on health-related issues, child feeding practices are not regarded as a health issue and therefore community members do not seek such information from them. Building the image of frontline health workers as a reliable source of information on child feeding practices would be helpful.

The following are the key elements to be considered while drafting BCC strategy.

Audience Segmentation: Women especially those coming to deliver at institutions, elder women in their family and health providers could be an important segment. Husbands have very little knowledge about breastfeeding but they could play a potential role in breastfeeding as the qualitative study showed that in those few cases when husbands advised to breastfeed women followed the advice. BCC efforts should include strategies to reach women delivering at home, from minorities, low SLI and education and living in poorly developed villages and hamlets which are small with less than 1,000 population.

Reorientation and Supportive Supervision of Frontline Health Workers: Desired breastfeeding practices were higher among women who delivered at institutions compared to those delivering

at home. With increasing trend in institutional delivery under the JBSY program, breastfeeding practices could be easily strengthened by orienting frontline health workers, mamtas and other health care providers at the institutions. Findings show that efficacy of ASHAs and AWWs needs to be increased by providing them appropriate check lists, communication aids and supportive supervision to make BCC strategy more effective. As also reported by Kumar et al., 2008, information on desired breastfeeding practices are not only required for women and their family members but also for frontline health workers.

Key Messages for BCC Strategy: Promotion of early and exclusive breastfeeding is essential for survival and growth of high-risk newborns, including low birth weight or pre-term babies (Darmstadt et al. 2008). Key messages for BCC strategy could include: early and frequent breastfeeding results in quick and increased production of milk, helps child survival: reduces heavy bleeding among women after delivery; wipe the newborn soon after birth and put to breastfeed immediately even while waiting for cord to be cut; prelacteal feeds could cause infection so give only breast milk; yellow milk gives strength; breastfeed in a quiet place so that child is not distracted and can feed till it's stomach is full and breast milk has water which is adequate for children till six months of age. Further, BCC framework developed by the Population Council (Khan et al, 2011b) has details of essential messages on appropriate positioning of the child while breastfeeding and feeding from one breast completely before switching to the next breast could also be included in messages.

Use of Appropriate Media Mix along with Inter-Personal Communication: Most of the rural Bihar (65 percent) has no access to mass media (NFHS 3). Further, PC study shows that 84-88 percent of the women did not read newspaper or watched TV or listened to radio. Therefore, currently, IPC through the network of frontline health workers is the best option. However, both mass media and mid-media played a role in influencing some women regarding breastfeeding practices. Therefore, mass media could be used effectively with interpersonal communication to reinforce messages. A mix of mass media and mid-media like TV, radio, wall paintings/posters, mothers meetings etc. could be used and information could be disseminated on Village Health and Nutrition Days and during ANC clinics. Exposure to mass media as reported in other settings (Agarwal et al., 2007; CARE-India, 2008; Kumar et al., 2008) and also mid media (McDivitt et al., 1993; Sachdev and Mehrotra, 1995) including community radio (Agarwal et al. 2007) have been effective in promoting breastfeeding practices.

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Increasing Appropriate Complementary Feeding in Rural Bihar

FIVE

Kumudha Aruldas, M. E. Khan and Avishek Hazra

Introduction

Complementary feeding for infants is recommended to be initiated when the infant completes six months of age. The three recommended infant and young child feeding (IYCF) practices for children 6-23 months of age are: continue breastfeeding; feed semi-solid/solid food according to the age of the child; and feed a variety of foods, such as cereals, fruits, vegetables and milk (GOI, 2004). It is recommended that children aged 6-8 months are given complementary food twice a day while those aged 9-23 months are given complementary food three times a day. The amount of food given should be equivalent to 200 kcal per day for children aged 6-8 months, 300 kcal per day for children aged 9-11 months and 550 kcal per day for children aged 12-23 months (AED, n.d.).

Complementary feeding practices affect the nutritional status of children. The critical period in a child's life is 6-23 months of age as this is the time when malnutrition sets in. Indeed, poor feeding practices coupled with infections are the two main causes of malnutrition among children under two years of age. After a child reaches two years of age, it is difficult to reverse stunting that has occurred. In Bihar, National Family Health Survey-3 (NFHS-3, 2005-06) data show that 34 percent of the children aged 6-11 months and 56 percent of the children aged 12-23 months were stunted (IIPS and Macro International, 2008). An analysis of NFHS-3 data shows that only 24 percent of children aged 6-23 months were given appropriate complementary food in rural Bihar.[5] District Level Household Survey-3 (DLHS-3, 2007-08) data indicate that in rural Bihar 38 percent of children aged 6-23 months were started on complementary feeding at the recommended age of six months. Under nutrition is also associated with morbidity and mortality due to malaria (Caulfield et al, 2004).

A review of the literature reveals that facilitating factors for desired complementary feeding practices were women's high educational status, high standard of living and exposure to mass media (Aggarwal et al., 2008; IIPS and Macro International, 2008; Khan et al., 2011). Involving mothers-

[5] Unless otherwise indicated, data from NFHS-1, NFHS-2, NFHS-3 and DLHS-3 presented in this chapter are based on an analysis, conducted by the Population Council, of currently married women aged 15-34 in rural Bihar who had given birth in the three years preceding the survey

in-law, members of community-based organizations, women's groups and registered medical practitioners in complementary feeding activities; providing mothers and caregivers behavior change messages and hands-on training on infant feeding, child care and hygiene; spot feeding of children; and distributing take-home rations for children have been shown to create a supportive environment for complementary feeding of young children (Dewey and Seth, 2008; Fjeld et al., 2008; IntraHealth International, 2008; Ruel et al., 2008). In addition, training health workers in counseling skills and providing them job aids have also been reported to be effective (Bhandari et al., 2004; CARE-India, 2008; IntraHealth International, 2008).

The main barriers to adoption of appropriate complementary feeding practices were perception of mothers that breast milk is adequate for the infant, a small child cannot eat much and the mother has "tried but the child did not eat" (Aggarwal et al., 2008). Health workers have generally not been involved in communication programs on nutrition and feeding practices, and they lack counseling skills (Bhandari et al., 2004).

In the context of Bihar, there are gaps in information about cultural beliefs and practices in initiating complementary feeding and process involved in child feeding; the barriers and facilitating factors to adopting desired complementary feeding practices. In this context, a formative study was undertaken by the Population Council in 2010-11 to understand the complementary feeding practices and identify key barriers and facilitating factors for uptake of healthy practices. The objectives of the study were:

- To understand the knowledge, attitude and practices of women in complementary feeding practices in the context of rural Bihar
- To identify factors that act as barriers and facilitating factors in adopting desired complementary feeding practices
- To draw implications for behavior change communication (BCC) initiatives that could accelerate adoption of desired complementary feeding practices

Methodology

The formative study was conducted in two phases. First, 317 in-depth interviews were conducted with family members, health care providers and *panchayat* members. Qualitative study was conducted in 24 villages: eight villages each from three selected districts located in three different regions. In second phase, a survey was conducted covering 2,941 households, 2,937 currently married women aged 15-34 years who had delivered a child in three years preceding the survey, 723 husbands, 712 mothers-in-law, 212 accredited social health activists (ASHAs), 243 *anganwadi* workers (AWWs), 137 auxiliary nurse midwives (ANMs), and staff at 90 government health facilities (primary health centers [PHCs] and community health centers [CHCs]) from 150 villages in nine districts spread across the nine administrative division of Bihar. Some of the findings of secondary analysis of NFHS, DLHS, and NRHM and qualitative findings given in this chapter have been taken from the study published by Sage Publications (Khan et al, 2012a). Details of study design and data collection methods have been discussed in introduction to this book.

Key Findings

In this chapter, key findings on complementary feeding are divided into three broad sections: the status of complementary feeding practices; barriers and influencing factors for appropriate complementary feeding practices.

The quantitative study was used to measure appropriate complementary feeding by using two indicators- types of food fed and the frequency of feeds given per day. For analysis, food groups were categorized as:

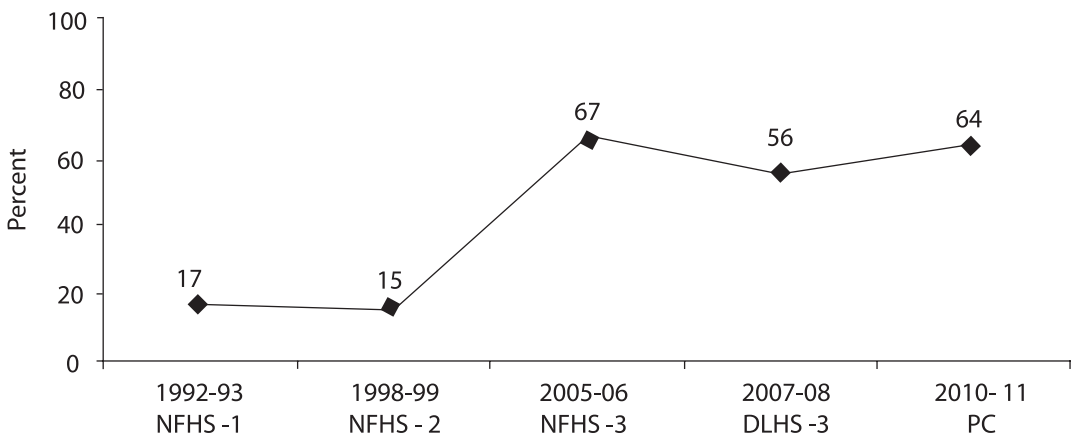
- Baby formula, powder/tinned milk, cheese, yogurt, and other milk products
- Cereal, other porridge/gruel, bread, noodles, grains, and other semi-solid or solid food
- Mangoes, papaya and other vitamin A rich fruits; potatoes, cassava, and other tubers; pumpkin, carrots and squash; and dark green leafy vegetables
- Other fruits and vegetables
- Beans, peas, lentils, and nuts
- Food made with oil, fat, *ghee,* or butter
- Eggs
- Chicken, duck and other bird meat; any other meat; liver, heart, and other organ meat; fish, dried fish, and shell fish

The quantity of food fed to children was assessed in the qualitative study while exploring child feeding practices.

Status and Trends

The findings show that, in rural Bihar, around 64 percent of children aged six months (N=149) were fed complementary food indicating no significant change since 2005-06 (NFHS-3), when it was 67 percent (N=109) (Figure 5.1). A comparison of the results of the three NFHS surveys

Figure 5.1: Trend in children aged six months fed complementary food



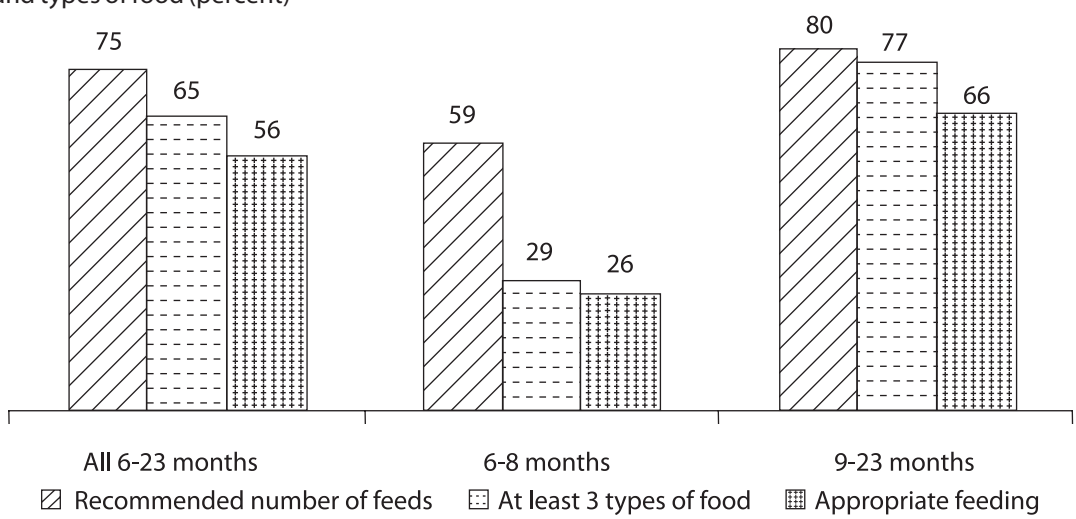
Source: Reanalysis of NFHS-1, NFHS-2, NFHS-3, DLHS-3 and Population Council, formative study, 2011.

however shows that the introduction of semi-solid food at six months has been increasing over time from 17 percent in NFHS-1 (1992-93) to 67 percent in NFHS-3 (2005-06) (Hazra and Khan, 2012). The steep increase between NFHS-2 (1998-99) and NFHS-3 (2005-06) could be because of program emphasis and promotional efforts of Integrated Child Development Scheme (ICDS) of Government of Bihar.

Complementary Feeding Practices

Women were asked in the survey about types of food and frequency of feeds given to children in 24 hours preceding the survey to assess complementary feeding practices. Overall, study findings show that 75 percent of children aged 6-23 months (N=1,795) were fed minimum number of feeds and 65 percent were fed at least three types of food (Figure 5.2). Considering both criteria together 56 percent of children were appropriately fed as per recommendations. No gender disparity was observed in practice of appropriate complementary feeding (56 percent among both boys and girls).

Figure 5.2: Children aged 6-23 months given appropriate feeding; recommended number of feeds and types of food (percent)



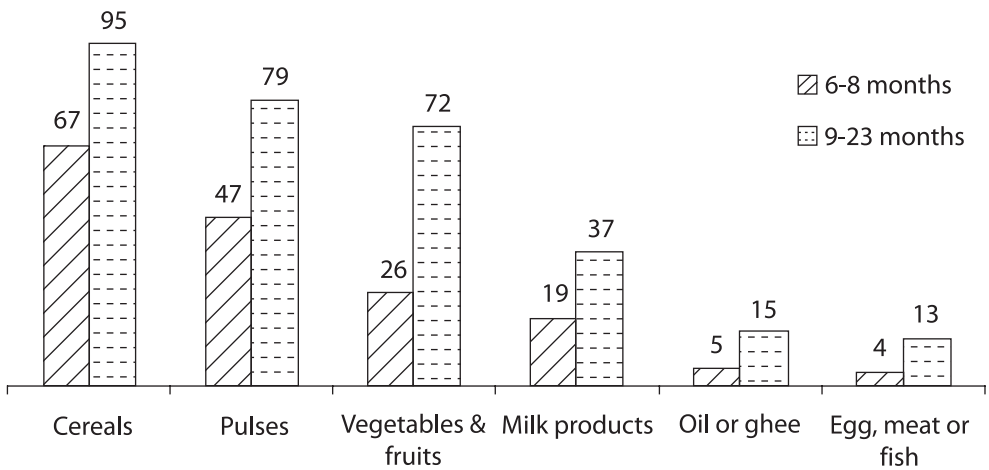
Source: Population Council, formative study, 2011.

Further analysis shows that 59 percent of children aged 6-8 months (N=447) were fed at least two times a day but only 29 percent were fed at least three types of food as recommended. Together, only about one fourth (26 percent) were appropriately fed. Among children aged 9-23 months (N=1,348), findings show that 80 percent were fed at least three times a day and 77 percent were fed three types of food as recommended. Collectively 66 percent were appropriately fed (Figure 5.2). The difference in the rate of appropriate feeding between children aged 6-8

months and 9-23 months is statistically significant (z test, $p<.05$). Six months is a critical age when transition from exclusive breastfeeding to complementary feeding is recommended. It is important to strengthen appropriate complementary feeding at this stage.

With regards to types of food fed for children aged 6-23 months include cereals (88 percent); pulses (71 percent); vegetables (60 percent); milk products (33 percent); food made with oil or ghee (12 percent) and egg or meat or fish (11 percent). However, as shown in Figure 5.3, it was found that children aged 6-8 months were fed less of any kind of food compared to children aged 9-23 months. Milk and pulses are good source of protein and messages to feed them would be an important element of BCC strategy.

Figure 5.3: Feeding practices by food groups among children 6-23 months as reported by women (percent)



Source: Population Council, formative study, 2011.
Note: Based on type of food given in the 24 hours preceding the survey.

The study shows that only 58 percent are initiating complementary feeding at the recommended age of six months while the rest either start before six months (6 percent) or delayed beyond six months (36 percent). Further analysis showed that significantly more number of women (48 percent; N=1,709) initiated complementary feeding from villages where there is an AWW compared to where there is no AWW (30 percent; N=86) (z test, $p<.001$).

The qualitative study by Aruldas et al, 2012, showed that very few women (7 out of 47) with children 0-6 months of age correctly said that eight months old child could be fed 100 gm each time. Women with children aged 7-12 months who were interviewed (N=46) about how much of food they fed to their children. Analysis showed that none of them were feeding the recommended quantity of food to their children.

Box 5.1: Barriers to Complementary Feeding

Individual /family/community level
• Perception that six months old child cannot eat food • Child's stomach will protrude if semi-solid or solid food is fed • Belief that child is habituated to drinking so cannot eat solid food. • Lack of knowledge of appropriate quantity of food to be given to child by age • Child is not fed from separate plate/no idea how much child ate • Poor attention given to appropriate feeding of child
System level
• Lack of knowledge on appropriate complementary feeding according to child's age • Little or no advise received from AWWs and ASHAs on appropriate complementary feeding • Limited or no counseling aid even at AWW centers • No demonstration cup/ bowl to educate on quantity of food child should get.

Source: Population Council, formative study, 2011.

In Bihar, performing rituals for initiating children on semi-solid or solid food is not a common practice. Only two women reported that there is a ritual for initiating complementary feeding when the child starts teething. As reported by a woman from other backward caste (OBC):

> In our village it is a custom to feed milk-rice for the first time to the child by mother's brother. We try to practice it. (OBC, educated up to class 10)

Barriers

Barriers to appropriate complementary feeding are listed in Box 5.1 and described below:

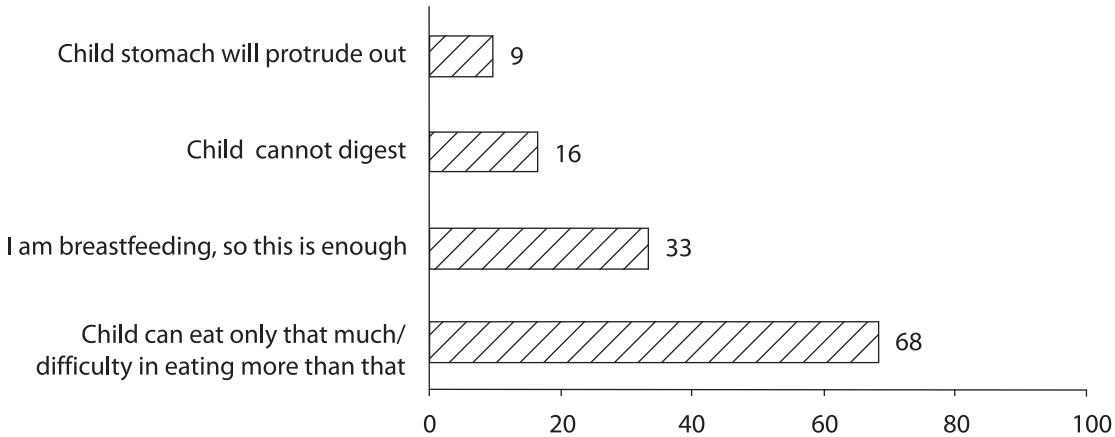
Perception that Six Months Old Child Cannot Eat

Women who did not feed their children recommended number of times (N=301), 68 percent reported because they thought the child cannot eat one more time or has difficulty in eating more than that (Figure 5.4). Most women (60 percent) reported that they were not sure whether child will eat more if fed actively and adequate time is given to the child to feed.

Other reasons for not feeding one more time includes that the child was being breastfed so they thought it was enough (33 percent); child cannot digest (16 percent) and child's stomach will protrude out if fed more (9 percent).

Qualitative study also showed that some women (17 who said above seven months or more as the right age to start complementary feeding) believed that six months old child "is too small to

Figure 5.4: Reasons for not feeding one time among women who fed less the recommended number of time (percent)



Source: Population Council, formative study, 2011.
Note: Percentage add to more than 100 due to multiple responses.

eat and food might get stuck in the throat", "has no teeth to eat", "is habituated to only drinking", "the child's stomach will protrude out" or "the food will get stuck in the child's throat". Most of these women (9 out of 17) said that 10-12 months would be the right age to start children on complementary feeding. They said:

> After 12 months child should be given rice, lentils [khichri, dal] or [roti] wheat bread because six months old child is a milk-drinking child and will not be able to eat, food will get stuck in the throat. When the child is 12 months old then they can eat comfortably. (OBC, educated up to Class 12) (Aruldas et al., 2012, p. 110)

> Children are given semi-solid food only after one year. When my first child was born my sister-in-law had told me to feed after one year. Before that if fed the child will not eat because the child is habituated only to drinking. Child will learn to eat very slowly if not the food will get stuck in the throat. If food gets stuck in throat then the child will not be able to drink even milk. (OBC, illiterate)

> From ninth month children should be given [roti], rice, [dal, Khichri] etc. if we start feeding children from six months, the child will eat but its stomach will protrude out therefore according to age very less should be fed. I our village some families feed their children at six months and all those children have protruded stomach. This is not good for health of the child. My mother also says the same. (OBC, illiterate) (Aruldas et al., 2012, p. 110)

> My daughter was eight months old when we gave her rice and lentils [*dal bhaat*] it got stuck in her throat. Then I gave her breast milk. (OBC, illiterate)

Mothers-in-law also perceived that a six months old child cannot eat and they too did not receive any information from any health worker or from any other source. One of the mothers-in-law from scheduled caste (SC) said:

> We feed children only when their teeth erupt. Six months old children do not have teeth so how can they eat. (SC, illiterate) (Aruldas et al., 2012, p. 110)

Only about one fourth of women with children aged 6-23 months (26 percent; N=1,795) reported that they feed their child from a separate plate. Qualitative study also showed that most women with child 7-12 months old (31 out of 47) reported that their child does not eat from a separate plate because they perceive that the child cannot eat by herself/himself and the child does not eat as much as if fed from the plate of a family member. Many times the child is fed by other family members such as the mother-in-law and older siblings. For instance, a woman reported:

> My child eats with my husband; the child is very small, how can he eat by himself? He will only eat when we feed him. The child dirties the whole place when he eats alone, it is better to feed him from our own plate. (SC, illiterate) (Aruldas et al., 2012, p. 110)

All this indicates poor attention to appropriate feeding of the child. Perception of women and other elder women in the family is that the child cannot eat much but gradually as they grow up they will start eating on their own. Most women (97 percent) had never seen any cooking demonstrations on how to make nutritious food and are not aware how to prepare food for children.

Lack of Information to Women About Complementary Feeding

The study shows that women do not get advice on complementary feeding. Eighty seven percent of the women interviewed (N=1,795) reported that no one advised them on complementary feeding. Very few women were advised by their mothers-in-law (seven percent) and by AWWs or ASHAs (four percent each) (Figure 5.5).

Figure 5.5: Person who advised on complementary feeding as reported by women (percent)

Source: Population Council, formative study, 2011.
Note: Percentage add to more than 100 due to multiple responses.

Qualitative study also showed that most women (24 out of 47) did not receive any advice from anyone. Moreover, women did not consider complementary feeding an as issue that could be discussed with health workers. As some women said:

> I do not know how much to feed the child, it would depend on the stomach of the child. All children are not the same so it will all depend on the child. When the child cries we feed little [roti]wheat bread and rice and when stops crying I stop feeding. No one, no health worker advised me about feeding children, I know it on my own. (OBC, illiterate)

> No one gave me any advice about feeding children solid or semi-solid food. ASHA did not tell me anything about this. I did not ask AWW about this because I did not think it was important. (SC, educated up to Class 9) (Aruldas et al., 2012, p. 111)

> Eight months old child can be fed lentil soup [dal ka pani] lentil soup and watery rice and pulses cooked together [khichri] about two large tea spoons [10 ml] about three times a day. Even if more time is given the child will not eat one bowl [katori =100 ml] because it is a milk-drinking child [doodh peenewala bachha hai]. No one has told me anything about feeding children. No AWW or ASHA or nurse told me about this. (OBC, educated up to Class 12)

Those who did receive advice they mostly received from their mothers-in-law or mothers (8 out of 47). Sometimes even when they know supplementary feeds should be started at six months of age, often, they referred only lentil soup and believed that other food should be given only after the child is about one year old. Women reported that their mothers-in-law or mothers told them to feed little rice and *dal* or to give some *khichri* or biscuits. Moreover, they believe that child can eat only a very small amount, much less than what is recommended. As one woman residing in a better developed village said:

> At six months child should be given complementary food. [Dal ka pani] lentil soup along with breast milk should be given when the child is six months of age. When the child is eight months old child can be given about two biscuits a day with milk. Rice, lentil, wheat bread [dal, roti] etc should be given only when the child is one year old otherwise the stomach will come out. Grains should not be fed before one year of age. My mother-in-law told me these things. ASHA also says that when the child is one year old, food should be given. (SC, illiterate)

The mothers-in-law also do not have adequate information about complementary feeding including amount of food that needs to be fed to a child. As one mother-in-law said:

> Eight month old child can be given [dal, roti], lentil, wheat bread, rice, [khichri], biscuit, milk etc. there is no fixed time to feed the children, whenever adults in the house eat the child is also fed a little. There is no measure as to how much should be fed to a child, little has to be fed. Even if time is spent to feed the food, the child will not eat but if time is spent to feed milk them the child will drink. (OBC, illiterate)

Husbands, who are the other influencing members in a family, also had very limited knowledge. Only 38 percent of husbands said complementary feeding should be initiated at six months of age. Half of them (50 percent) who were interviewed said seven months or more was the right age to start complementary feeding. However, most of them (75 percent) reported they will tell their wife and ensure that the child is initiated on complementary feeding at the age of six months.

In the qualitative survey few women who received advice from health care providers (AWW: 2, ASHA: 1, ANM/Nurse: 2 and doctor: 3) reported that they were advised to feed little rice, roti, dal ka pani or cereal otherwise the child will start becoming very thin or just feed solid or semi-solid. The advice given is far from adequate. Neither the family members nor the health care providers who advised women to feed complementary food told on how much food to be fed or how many times the child should be fed.

Limited Knowledge About Complementary Feeding among FHWs

Around two-thirds (68 percent) of ASHAs (N=212) reported that complementary feeding should be started when the child is six months old; 4 percent reported 3-5 months and 28 percent reported 7-9 months as the correct age for starting complementary feeding.

AWW workers in the ICDS system are expected counsel women on child nutrition. Most of them (70 percent; N=243) reported that most women in their area start complementary feeding when the child is 6 months old while only 58 percent of women reported that they initiated complementary feeding at the age of six months. Such perceptions of AWWs could be a hindrance to counseling women to start complementary feeding at the right age. Most AWWs (84 percent) reported that children become malnourished because mothers do not feed adequate quantity of food or they do not know how much to feed. Only 34 percent of them said that malnourishment is because mothers delay the start of complementary feeding. Seventeen percent perceived poverty as the cause for malnutrition.

AWWs, like other women in the community, were (98 percent) well aware of frequency of complementary feeds that is recommended for children. When asked about types of food that could be fed to children most of them (78-98 percent) reported cereals, pulses and milk and milk products. For younger children aged 6-8 months, they reported fruits (44 percent), vegetables (35 percent), eggs (16 percent) and meat or fish (7 percent). But with regards to quantity of food, only 30 percent of AWWs believed that a child aged 6-8 months can eat about 100 gms of food. This perception even for older children does not change much and only 58 percent believe that a child aged 12-23 months can eat about 100 gms of food. The AWWs said:

> I advice women with children aged 6-8 months to feed about 2-3spoons of lentil soup [dal ka pani], vegetable soup [sabji ka pani], mashed [roti] wheat bread and rice about 2-3 times. I did not get training on how much should be fed so I do not know. Small amounts should be fed. (High caste, educated up to Class 10)

Knowledge and perception among ANMs was not very different from AWWs. Nearly all of them (95 percent) knew the minimum number of feeds that a child should get. With regards to types of food that should be fed to children more than 95 percent reported pulses could be given which is a good source of protein. Knowledge about the types of food that could be fed to younger children aged 6-8 months is low. They reported fruits (64 percent); vegetables (32 percent); eggs (15 percent) and meat or fish (10 percent). Perception about how much a child could eat was very poor. Only 10 percent of ANMs reported that children aged 6-8 months could eat about

100 gms of food. Thirty three percent and 67 percent reported that children aged 9-11 months and 12-23 months respectively could eat about 100 gms of food.

These findings indicate lack knowledge on appropriate complementary feeding practices among frontline health workers. This knowledge for younger children aged 6-8 months was poor compared to that of the older children. Building their capacity is essential for effective communication and counseling efforts provided by them.

Limited identification of malnourished children by the AWWs

According to the data from NFHS-3 (2005-06), 68 percent of children aged 6-23 months (N=633) were undernourished (weight for age). However, PC study shows that most AWWs (75 percent) said they had less than 20 malnourished children in their area which seems much lower than NFHS-3 estimates. This is probably so because AWWs have to distribute supplementary food to severely malnourished children and therefore they have only severely malnourished children in their mind. This may limit the chances of counseling women with mild or moderate malnutrition. As some AWWs said:

> I have 12 malnourished children in my area. Their body looks dried up [sikuda] and thin. I got a tape which we used to put around the child's arm and see if normal or malnourished. Green color means normal and yellow means malnourished. Now just by looking at the child we can recognize malnutrition. (SC, educated up to Class 10)

> I have 12 malnourished children in my area. By looking at the child we can make out if the child is malnourished or not. Malnourished children have difficulty in walking and they look thin. (OBC, educated up to Class 10)

Limited or No Counseling Aid with AWWs

Of the 243 AWWs interviewed very few had any counseling aids; pamphlets/leaflets (17 percent); posters (29 percent) and flip charts (14 percent). However, when explored during qualitative interviews, they did not have any IEC materials to show. One out of 41 AWW said she had posters which she uses to show what could be fed to a child but all others reported that they did not have any poster or flip chart to explain to women. Further, AWWs reported that they did not have any fixed measure to show women to explain how much food should be given to a child. AWWs reported they explain the amount of food to be fed verbally (17) or use their own bowl (nine) or bowl from women's house (seven). Others said they did not have a bowl and did not explain:

> We did not receive any bowl [katori] or poster or flip chart. I just explain roughly how much to feed. (OBC, educated up to Class 10)

Equipping frontline health workers with relevant and culturally appropriate counselling aids is necessary in places where reach of mass media is low. The study shows that 84-88 percent of women did not read newspaper or watched TV or listened to radio.

Facilitating Factors for Appropriate Complementary Feeding

The findings of analysis done on background characteristics of women and program variables that facilitate appropriate complementary feeding are highlighted in Box 5.2 and discussed in this section.

Box 5.2: Facilitating factors for Complementary Feeding

- Women receiving three or more ANC
- Perception that complementary food is good for the child
- Correct knowledge about the age to initiate complementary feeding and feeding practices
- Counseling from health care providers
- If given time the child will eat more

Source: Population Council, formative study, 2011.

Background characteristics

Background characteristics of women like religion, caste, standard of living index, type of family, education, children ever born, working status of women outside home etc did not show any significant difference in practicing appropriate complementary feeding (Table 5.1).

Table 5.1: Children aged 6-23 months given appropriate complementary feeding (percent)

Variable	Category	Children given appropriate complementary feeding	Total
Religion	Hindu	55.9	1,498
	Non-Hindu	57.6	297
Caste	Scheduled Caste/ Scheduled Tribe	55.7	433
	Other Backward Caste	57.6	1,123
	General caste	50.6	239
Standard of Living Index	Low	53.6	690
	Medium	57.4	808
	High	58.9	297
Type of family	Nuclear	57.0	852
	Joint	55.5	943

Table 5.1 Continued

Table 5.1 Continued

Variable	Category	Children given appropriate complementary feeding	Total
Education of women[1]	No education	54.2	1,180
	Primary	59.7	238
	Secondary /Higher	60.5	377
Children ever born	1	52.9	403
	2	60.0	452
	3	54.2	397
	4+	57.1	543
Work status	Working	55.6	1,525
	Not working	56.3	270
Number of ANC check-ups	No check-up	49.8	213
	<3 check-ups	54.9	699
	>= 3 check-ups*	58.8	883
Number of times ASHA contacted	no contact	56.0	766
	1-2 contact	56.9	471
	3 or more contact	55.9	558
Exposure to mass media[2]	Yes*	62.2	1,549
	No	55.3	246
Presence of VHSC	Yes	65.2	69
	No	55.9	1,726
Self-help group/*mahila mandal* in village	Yes	56.2	805
	No	56.3	990

Source: Population Council, formative study, 2011.
Note: Analysis based on last birth of currently married usual resident women aged 15-34 years who had given birth in the three years preceding the survey.
[1] Primary education =1-5 years of education; secondary education =6-12 years of education; higher education =13 or more years of education.
[2] Mass media = Television, radio or newspaper.
χ^2 test, *p<.05, **p<.01

A logistic regression analysis was conducted to identify the determinants and facilitating factors for appropriate complementary feeding. Background characteristics of women do not show any significant effect on practicing appropriate complementary feeding (Table 5.2).

Table 5.2: Results from the logistic regression analysis on appropriate complementary feeding

Variable	*Category*	*Odds Ratio*
Religion	Non-Hindu®	—
	Hindu	0.92
Caste	SC/ST®	—
	OBC	1.03
	General caste	0.73
Standard of living index	Low®	—
	Medium	1.12
	High	1.04
Type of family	Nuclear®	—
	Joint	0.90
Education of women[1]	No education®	—
	Primary	1.20
	Secondary/higher	1.29
Children ever born	1®	—
	2+	1.26
Number of ANC check-ups	No ANC®	—
	<3 ANC	1.22
	>= 3 ANC	1.41*
Exposure to mass media[2]	No®	—
	Yes	1.27
Presence of VHSC	No®	—
	Yes	1.49
Total		**1,795**

Source: Population Council, formative study, 2011.
Note: Analysis based on last birth of currently married women aged 15-34 years who had given birth in the three years preceding the survey.
[1] Primary education =1-5 years of education; secondary education =6-12 years of education; higher education =13 or more years of education.
[2] Mass media = Television, radio or newspaper. Dependent variable: Appropriate complementary feeding given (Yes=1, No=0);
® Reference category; *p<.05; **p<.001

Program Factors

Among program variables, the only somewhat significant predictor associated with the practice of appropriate complementary feeding is number of antenatal check-ups received and number of contacts with ASHA (χ^2 test, $p<.05$) (Table 5.1). However, number of ANC of women is dependent on number of contact by ASHA with them. The logistic regression analysis (Table 5.2) shows that practice of appropriate complementary feeding was higher (OR=1.41, $p<.05$) among women who received three or more antenatal check-ups as compared to those who did not receive any check-up. Other program factors, such as presence of self-help groups and women's groups (*mahila mandals),* living in a village which has VHSC and exposure to mass media did not have any significant effect on uptake of appropriate complementary feeding. This indicates that special attention and efforts are required to increase the practice of appropriate complementary feeding.

The quantitative study revealed following facilitating factors:

Perception that Complementary Food is Good for the Child

Women (11 out of 24) perceived that if complementary food is given at six months of age then the child will be "strong" or "stomach will be full and not be hungry" or simply "get used to solid food". Women as reported in Aruldas et al., 2012, p. 113, said:

> After six months of age the child should be given dal ka pani and small pieces of roti because only if the child eats will it get some strength. No one told me anything about feeding food to children. (SC, illiterate)

> In my opinion children should be fed food from the age of six months because only by eating small will they learn to eat well. (SC, illiterate)

Knowledge on Right Age to Initiate Complementary Feeding

Women with children less than 6 months of age were asked about the right age when children should be started on complementary food. Women who had the correct knowledge about when to start complementary feeding said:

> Till six months of age only mother's milk should be given. After six months, [khichri], cow's milk, biscuit etc should be given. When I used to go for ANC check up, one nurse had told me that the child should be given something to eat and drink only after six months of age. (SC, illiterate) (Aruldas et al., 2012, p. 113)

> Child should be given semi-solid food like [khichri] after six months because a nurse had said that till six months only breast milk should be given and from seventh month onwards complementary food should be given. (OBC, illiterate)

> Now my child is very small [25 days] so I will start giving other food like [khichri], cerelac and other things after 6 months. The doctor at Turkaulia told me this. (SC, educated up to Class 9)

This shows that women who were counseled by health care providers and have the knowledge were convinced that complementary feeding should be initiated at six months of age. However, very few women reported that they were advised by health care providers (doctor – 3, ANM/ nurse – 2 and ASHA – 1) to start complementary food at six months of age. This indicates the need to strengthen interpersonal communication.

Counseling From Health Care Providers

Health care providers are credible source of information on complementary feeding practices. As one woman said:

> *Roti* and semi-solid food should be given from the seventh month onwards because nurse said that till six months only mother's milk should be given and after that semi-solid food should be given. (OBC, illiterate) (Aruldas et al., 2012, p. 113)

Counseling by health care providers not only increases the knowledge but also promotes practice. For example one mother-in-law was advised by a doctor on complementary feeding and she did demonstrate the knowledge and was convinced as:

> Child of 6-8 months should be fed [khichri], rice, [roti] wheat bread, etc about 3-4 times a day. The child can eat about this much [100ml] of a bowl [katori]. If fed slowly child can eat that much. All this was told to me by the doctor in Motihari. I tell the same thing to my daughter-in-law. ASHA did not tell me anything. After the child was born [in institution] she went away to her home. AWW also did not tell me anything. (SC, illiterate) (Aruldas et al., 2012, p. 113)

This though was only partially translated into practice by her daughter-in-law who has an 11 month old child; there is was a positive attitude that the child should be fed semi-solid or solid food, as the woman said:

> We started giving biscuits after the sixth month. She started eating rice lentils [daal bhat] and [maandh bhat] at ninth month. Now my mother-in-law feeds her. I feed her food when I eat. My brother-in-law also feeds her. She eats along with me, not from separate plate. I feed her 2-3 spoons [15 gm] about 2-3 times a day. We don't feed her separately because she cannot eat much. (SC, illiterate)

This indicates that if health care provider re-enforced information about appropriate complementary feeding, the practice in the communities could show a positive shift.

The role of AWWs is to promote healthy feeding practices and prevent malnutrition. They reported that six months is the right age for children to be started on semisolid/solid food and also reported that most women in their communities started children on semisolid/solid food at the age of six months. Few AWWs said that after six months the amount of breast milk decreases and also some women go to the field so they start semisolid/solid food at six months. However, very few women (four percent) were advised by health care providers to start complementary food at six months of age. This indicates the need to strengthen interpersonal communication (IPC).

Discussion and Implications for BCC Strategy

The study showed that there was steep increase in rate of complementary feeding of children aged six months from 1998-99 (NFHS-2) to 2005-06 (NFHS-3) but after that it has not shown much improved. The study showed that 64 percent of children aged six months were fed complementary food. Further, 29 percent of children aged 6-8 months were fed three types of food and 59 percent were fed at least two times a day as recommended. Among children aged 9-23 months, 77 percent were fed three types of food and 80 percent were fed at least three times a day. However, qualitative study showed that no child aged 6-23 months was fed recommended quantity of food.

There is delay in initiating complementary feeding; only 58 percent children were initiated on complementary feeding at recommended age of six months. Women believe that a six-month old cannot be given complementary food because "*food will get stuck in the throat*", "*child's stomach will protrude*", "*six month old children have no teeth so how can they eat*" or "*the child is habituated to drinking so cannot eat food*". Moreover, there is a strong perception that the child can consume very little. Qualitative study showed that only 7 out of 47 women correctly said that an eight month old child could be fed 100 gm each time. Supplementing breast milk with animal for a six months old child is considered enough leading to delay in starting on complementary food. These barriers could contribute to widespread malnutrition among infants and children below 2 years.

Women lack information about complementary feeding. Most women (87 percent) reported that no one advised them about complementary feeding. Counseling by frontline health workers (AWWs and ASHAs) was found to be very negligible (four percent). Frontline health workers also lack knowledge and have no counseling aids on complementary feeding. Knowledge about appropriate feeding practices for children aged 6-8 months is poor compared to what can be fed to 9-23 months old children. Even AWWs do not give this information confidently, and do not know how to explain complementary feeding practices to mothers. In the absence of any counseling aids and measuring cups to demonstrate the quantity of food to be fed, their counseling efforts will have little impact on promoting these practices. The practice of feeding children from a separate bowl is not followed and hence mothers have no idea how much the child has eaten; they feel that "*we give as much food as the child can eat*".

Facilitating factors include perception that complementary food is good for the child, knowledge on right age to initiate complementary feeding and counseling from a health care provider. The study showed that women who received three or more ANCs were more likely to practice appropriate complementary feeding.

The findings clearly indicate that a BCC strategy is required to promote appropriate complementary feeding of children aged 6-23 months. Implications for BCC strategy include:

Audience Segmentation

The family members especially elder women in the family like mothers-in-law are key advisers to women on complementary feeding. While entire family is involved in the process of child feeding, none of the family members are aware of recommended quantity of food and frequency of feeds required for optimum growth of the child. Those who had correct knowledge had right attitude towards complementary feeding practices. Husbands could also be involved as the study shows that husbands were willing to ensure that their children are started on complementary feeding at the right age. The study further shows that feeding practices are negatively or positively influenced according to the knowledge of elderly women in a family. Therefore, BCC strategy need to reach women, mothers-in-law, and husbands who are the key persons responsible for normal growth of the child. The literature review shows that involving key members of the community, including mothers-in-law, fathers-in-law, members of community-based organizations and women's groups and registered medical practitioners can create a supportive environment for complementary feeding for young children (as reported by Fjeld et al., 2008, IntraHealth International, 2008). Therefore, family members could be part of the communication strategy to promote complementary feeding practices.

Build Awareness among Women and Family Members

Women believed that child cannot eat much or would have difficulty in eating (similar findings are reported in Aggarwal et al., 2008, Aruldas et al., 2010). Women were not aware how frequently and how much to feed the child each time. Key messages should be the right age to start semi-solid or solid food, the quantity and types of food to be fed, how to prepare food for infants at home, milk and pulses are good source of protein, to give adequate time to feed the child and the importance of nutrition during the first two years of child's life for optimum growth of the child.

Alignment of Messages

The study shows that IPC, during ANC checkups or otherwise, played important role in promoting complementary feeding practices. Therefore, BCC strategy could align and reinforce messages on complementary feeding with IPC as the main mode of communication and mass media including demonstration sessions on preparing complementary food in small group activities as the supportive mode of communication. During these sessions, information would need to be given on making the food energy dense by adding a spoon on edible oil, butter or *ghee* (IntraHealth International, 2008; Ruel et al., 2008). The UP study (Khan et al., 2012 b) clearly indicates that counseling on certain behaviors during antenatal checkups or after institutional delivery, like continuing exclusive feeding for six months, transitioning from LAM to use other contraceptive methods or timely and appropriate initiation of complement feeding does have impact. It is suggested that women need to be visited around 4-6 months after delivery and counseled on these behaviors. Visits by ASHA in the fourth, sixth and eighth month for counseling on exclusive breastfeeding, postpartum

contraception, initiation of complementary feeding and vaccination against measles may perhaps be more effective. The BCC framework developed by Population Council also suggests details for media planning, for example segmenting audiences, planning audience-specific messages and choosing an appropriate media mix (Khan et al., 2011).

Building Image and Capacity Image of Frontline Health Workers

In general, frontline health workers are considered as credible source of information on health-related issues, however, child feeding practices are not considered as a health issue and therefore community member do not seek information from them on complementary feeding practices. Image building of frontline health workers as a reliable source of information on child feeding practices would be an effective BCC strategy. However, frontline health workers need to be reoriented and their capacity built on issues of complementary feeding (Bhandari et al., 2004; CARE-India, 2008; IntraHealth International, 2008). In addition, they should be equipped with counseling aids on child feeding practices. It is critical to reach out to women and their family members when the child is five months old to promote desired complementary feeding practices.

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SIX

Increasing Postpartum Contraception in Rural Bihar

Isha Bhatnagar, M. E. Khan and Avishek Hazra

Introduction

Studies show that closely spaced pregnancies pose health risks to both mothers and newborns. Demographic and Health Survey (DHS) data from 18 countries indicate that compared with children born less than two years after a previous birth, children born two to four years after a previous birth were 1.5 times more likely to survive the first week of life and 2.3 times more likely to survive the first year of life (Setty-Venugopal and Upadhyay, 2002). Closely spaced pregnancies are significantly associated with increased risk of adverse perinatal outcomes, such as preterm birth, low birth weight and low gestational age (Conde-Agudelo et al., 2006). It has been found that women with a short inter-pregnancy interval (less than six months) are at higher risk of maternal death (OR=2.54), third trimester bleeding (OR=1.73), premature rupture of membranes (OR=1.72), and anemia (OR=1.30) than women with a longer inter-pregnancy interval (Conde-Agudelo and Belizán, 2000). Adequate birth intervals also gives mother time to recover physically, fully breastfeeding each child and avoid the challenges of taking care of many infants and the household (Hall et al., 2008; Khan et al., 2008; Salway and Nurani, 1998).

Bihar has the highest total fertility rate (3.9) and one of the lowest contraceptive prevalence rates (34 percent) in the country (IIPS and Macro International, 2007; RGI, 2011). The unmet need for any family planning method was 26 percent in 2007-08 (IIPS, 2010). Moreover, more than two thirds of women (68 percent) get married before the age of 18 (IIPS, 2010). The WHO recommends birth spacing of at least 24 months between the previous birth and next pregnancy (WHO, 2007); though almost a third (29 percent) of births in Bihar occurred within 24 months of the previous birth in 2005-06 (IIPS and Macro International, 2007). Some of the goals of the state related to family planning are to reduce the total fertility rate (TFR) from 3.9 to 2.1 by 2010-11, to increase the contraceptive prevalence rate (CPR) of any modern method to 34 percent by 2010-11 and to increase male participation in family planning (NRHM, n.d.). Increasing postpartum contraception could contribute significantly to reducing maternal and child mortality and morbidity by allowing women to space births, avoid unintended pregnancies and unsafe abortions, and stop childbearing when women attain their desired family size. One of the effective strategies for promoting postpartum contraception is behavior change communication (BCC) along with making supplies available.

Review of literature shows that there are many reasons to why women do not adopt postpartum contraception (Bhatnagar, 2011). However, specific socio-cultural barriers and facilitators need to be explored in the context of rural Bihar and what implications they have on BCC. This chapter explores why women are not using any contraception after the delivery of their last child (commonly referred to as postpartum contraception in the chapter) in rural Bihar and; the implications it has on developing a BCC strategy. The specific objectives of the chapter are to:

- Assess the current status and trend of postpartum contraception in rural Bihar
- Identify the barriers and facilitating factors to adoption of postpartum contraception
- Identify program level BCC initiatives that could help increase postpartum contraception in rural Bihar

Methodology

The formative study was conducted in two phases. First, 317 in-depth interviews were conducted with family-level stakeholders, health care providers and *panchayat* members in 24 villages: eight villages each from three selected districts located in three different regions. In the second phase, a large quantitative survey was conducted covering 2,941 households, 2,937 currently married women aged 15-34 years who had delivered a child in three years preceding the survey, 723 husbands, 712 mothers-in-law, 212 accredited social health activists (ASHAs), 243 *anganwadi* workers (AWWs), 137 auxiliary nurse midwives (ANMs), and staff at 90 government health facilities (primary health centers [PHCs] and community health centers [CHCs]) from 150 villages in nine districts spread across the nine administrative divisions of Bihar. Some of the findings of secondary analysis of NFHS and DLHS, and qualitative findings given in this chapter have been taken from the study published by Sage Publications (Aruldas et al., 2012). Details of study design and data collection methods have been discussed in introduction to this book.

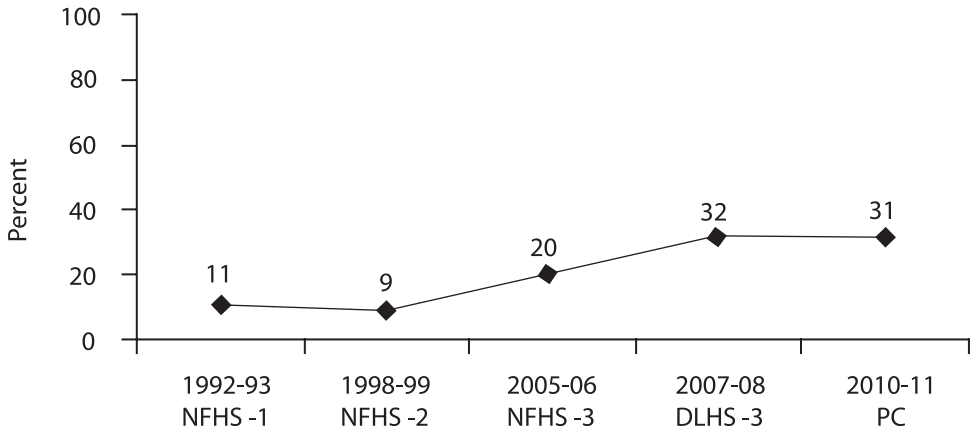
Key Findings

Current Status and Trend

Among currently non-pregnant women aged 15-34 years who had given birth three years preceding the survey (N=2,526), only 31 percent were using a contraceptive method. Though there is a steady and slow increase in the use of postpartum contraception in rural Bihar, it remains far below the national average of 43 percent[6]. In the last 18 years, there has been a rise of 20 percentage points (11 percent in 1992-93 to 31 percent in 2010-11); which is around 1 percent point per year (Figure 6.1). Further, contraceptive use among women who had given birth within one year

[6] Unless stated otherwise, data from NFHS-1, NFHS-2, NFHS-3, and DLHS-3 presented in this chapter are based on an analysis, conducted by the Population Council, of currently married women aged 15-34 in rural Bihar who had given birth in the three years preceding the survey.

Figure 6.1: Trend in use of postpartum contraception, as reported by women in rural Bihar

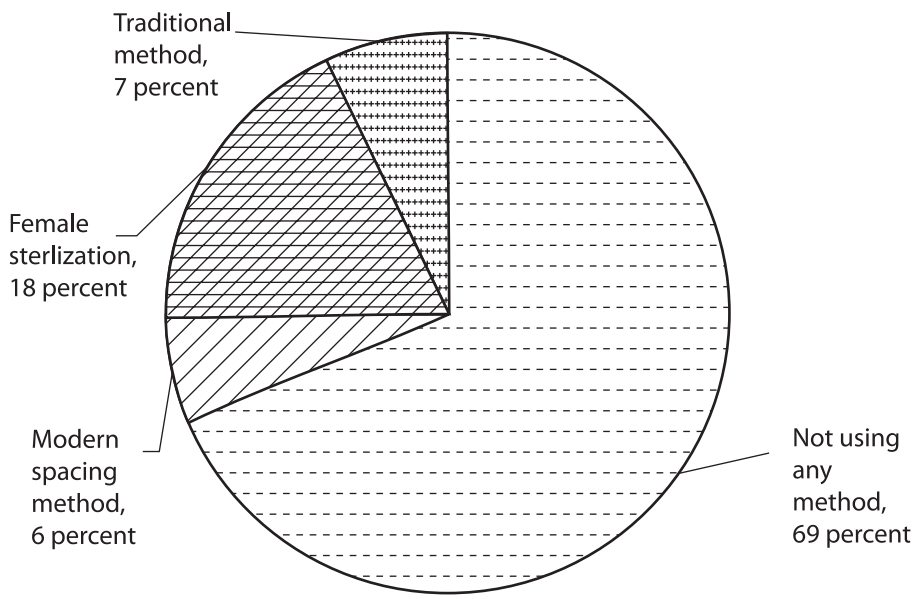


Source: Reanalysis of data from NFHS-1, 2 and 3, DLHS- 3 and Population Council formative study, 2011.

preceding the survey has increased by only 12 percent points (from 8 percent in 1992-93 to 20 percent in 2010-11); which is less than 1 percent point per year.

Figure 6.2 depicts the skewed choice of method. It was found that use of modern spacing methods was dismally low at 6 percent and use of traditional methods was at 7 percent. The most

Figure 6.2: Contraceptive use, reported by women in rural Bihar



Source: Population Council, formative study, 2011.

used method was female sterilization (18 percent), followed by safe period and withdrawal (3 percent each). Among modern spacing methods, condom use was the highest- 2.9 percent, followed by oral contraceptive pills (OCPs) (2.5 percent). Only nine women (less than 1 percent) reported that they were using IUD and 11 were using injectables (less than 1 percent). The picture is similar among currently non-pregnant women who had given birth within one year preceding the survey (N=1,234). Only 21 percent were using any method; 10 percent had adopted sterilization, 5 percent were using modern methods and 6 percent were using traditional methods.

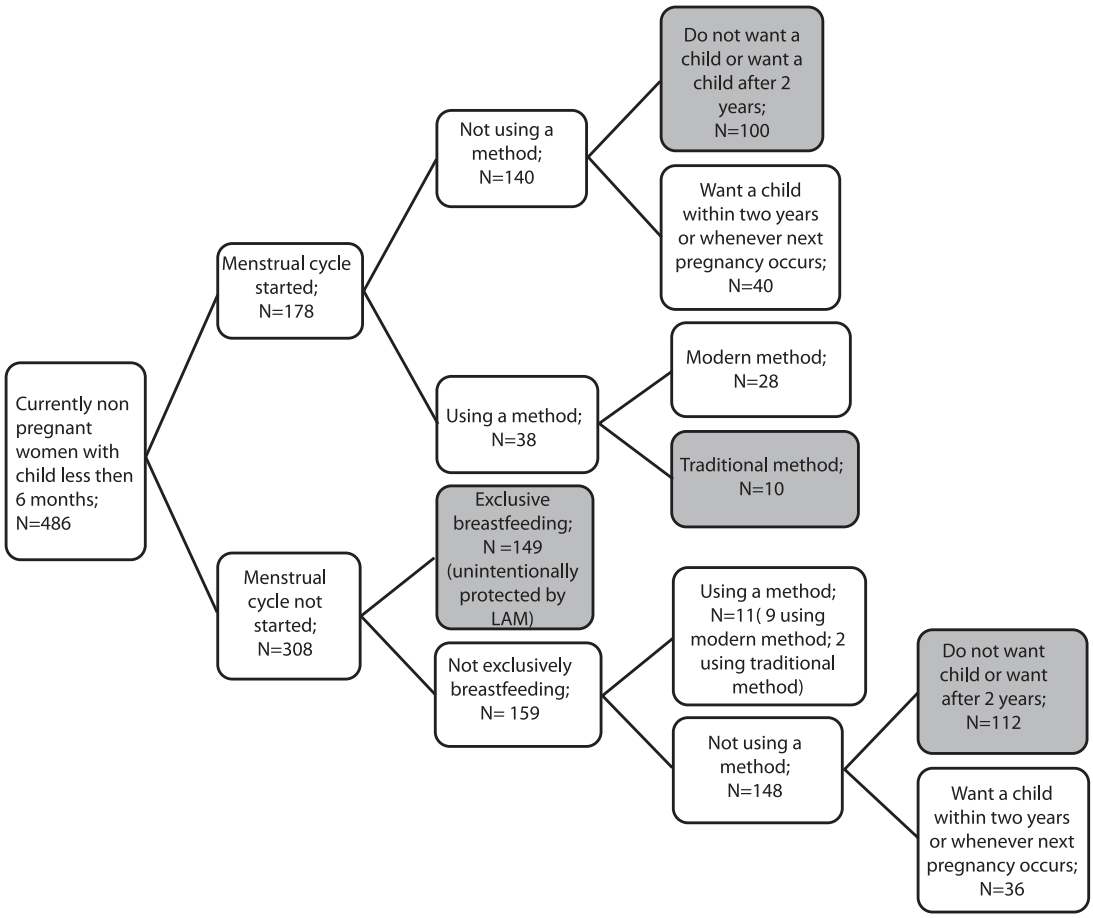
Exposure to Risk of Pregnancy in First Six Months of Postpartum Period

An attempt has been made to assess what proportion of women in the first six months postpartum was exposed to pregnancy. An analysis of 486 currently non-pregnant women who had given birth in the six months preceding the survey shows that only 149 women (31 percent) were unintentionally protected by the lactational amenorrhea method[7] (LAM). Only one woman among them had knowledge of LAM and was intentionally practicing it for delaying next pregnancy. For rest of the women, their menstruation had not started and they were exclusively breastfeeding hence, unintentionally protected by LAM. These women would be exposed to risk of pregnancy if their menstruation resumes anytime or they stop exclusively breastfeeding, which mostly happens around 3-5 months; when many women begin feeding water and supplementary food other than breast milk to their child (refer to chapter four for details).

Knowledge of LAM and conscious practice of it to delay next pregnancy is practically nonexistent and many women believed that resumption of the menstrual cycle is the biological marker for return of fertility (discussed later in the chapter). Further, correct knowledge of traditional methods and the safe days of the menstrual cycle was poor. Thus, by taking all those who were unintentionally protected by LAM, primarily using traditional methods and those who do not want a child or want after two years were potentially exposed to risk of unwanted pregnancy. Among women who had a child less than 6 months, 77 percent were at the risk of unwanted pregnancy as shown in Figure 6.3. The key reasons why these women were not using a contraceptive method (N=212) were because menstruation had not started (36 percent; reported by those who were not protected by LAM), child was small (55 percent), husband lives in other town for work (15 percent) and fear of side effects (8 percent).

[7] LAM is a temporary contraceptive method for postpartum women. LAM can be practiced if three conditions are met: the mother is exclusively breastfeeding, menstruation has not resumed and the infant is less than 6 months of age (ESD, 2008).

Figure 6.3: Women with child less than six months, at risk of unwanted pregnancy

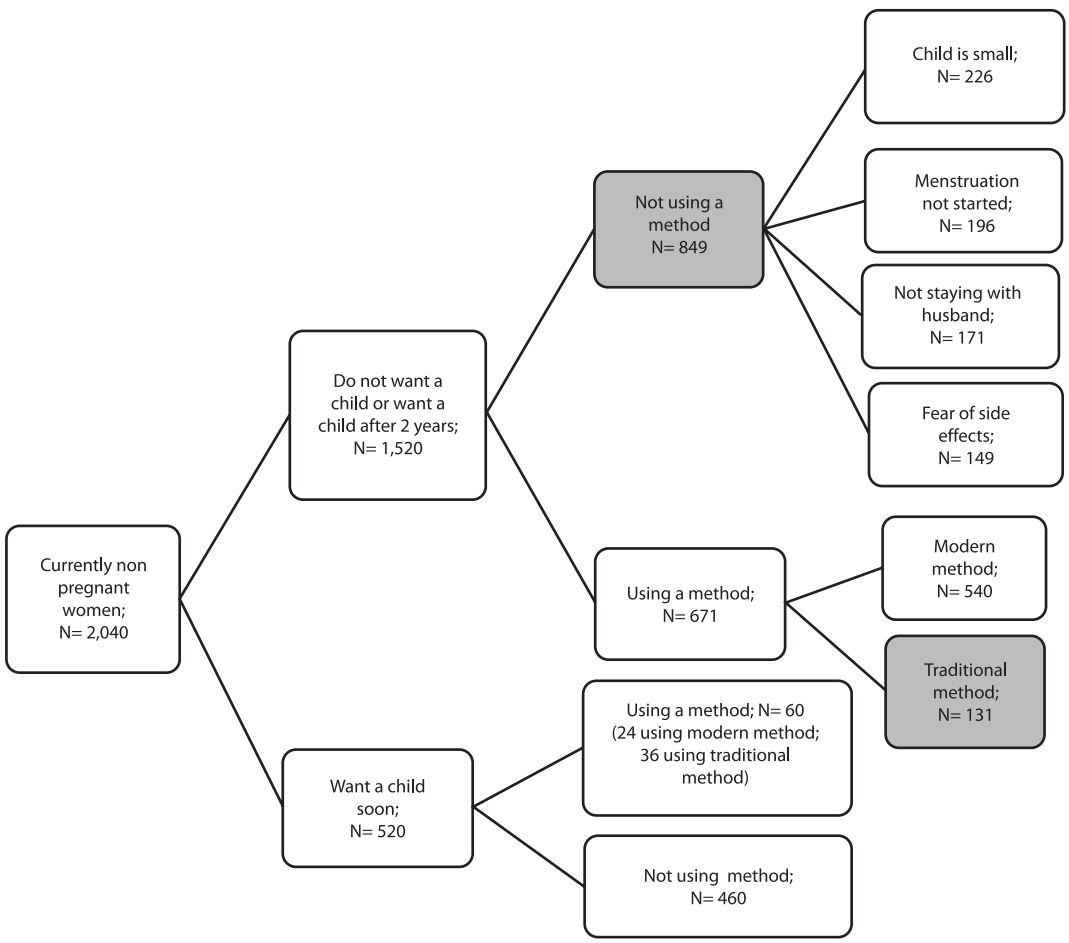


Source: Population Council, formative study, 2011.

Exposure to Risk of Pregnancy Among Women with Child Six Months or More

A similar analysis was made for women whose last child was more than six months. Among the 2,040 currently non-pregnant women who had given birth in the 6-36 months preceding the survey, 48 percent (N=980) were at risk of unwanted pregnancy because they were not using any modern method and did not want any children or wanted children after two years. Figure 6.4 shows that among those who did not want any children or wanted after two years were not using a method because they perceived that their child is small, menstruation had not started, and their husband was out for work or because of fear of side effects. Among those who were using modern methods (N=540), most had adopted sterilization (79 percent); while less than 10 percent each were using condoms and pills. Among those who were using traditional methods (N=131), half were using the safe period and the rest were using other traditional methods.

Figure 6.4: Women with child six months or more, at risk of unwanted pregnancy



Source: Population Council, formative study, 2011.

Social Norms and Social Structure

Social norms are codes of conduct that either prescribe or proscribe behaviors that members of a group can enact (Lapinski and Rimal, 2005) and shape the social structure. Norms elicit conformity to a behavior and prohibit people to act in certain ways which are not acceptable to society. Fertility related norms regarding first pregnancy, desired family size and family composition and birth spacing play a crucial role in determining contraceptive behavior. Hence, it is essential to understand fertility related norms and the social structure of rural Bihar.

First Pregnancy

The mean age at marriage was 16.4 years (S.D= 2.5) and the mean age of *gauna* (cohabitation with husband) was 17.1 years (S.D=2.2). Around half of the women became pregnant within 14 months after *gauna*. About 17 percent of women were less than 18 years when their first child was born; while 62 percent were between the ages of 18-21 when their first child was born (N=2,937). However, most women desired to have their first pregnancy when it occurred. Table 6.1 shows that a quarter of women got pregnant within six months of *gauna* and most were satisfied with that timing of pregnancy. As expected, the first child is desired soon by all women.

Table 6.1: Gap between *gauna* and first pregnancy and desire for timing of that pregnancy (percent)

Gap between *gauna* and first pregnancy	Wanted that time	Did not want at that	Total
1 to 6 months	82.0	18.0	721
7-12 months	87.9	12.1	619
13-18 months	90.5	9.5	400
More than 18 months	95.2	4.8	1,197
Total	**2,636**	**301**	**2,937**

Source: Population Council, formative study, 2011.

In general, it seemed that delaying first pregnancy did not appear as a very accepted norm in the community. For instance, only 2 percent delayed their first pregnancy, mostly by using pills and condoms. They key reasons for not delaying the first pregnancy were pressure from family to have a child soon (24 percent) or husband did not agree to delay the first pregnancy (20 percent) or for no reason (22 percent). Almost half (49 percent) of the mothers-in-law reported that they would not approve a newly married woman to adopt a contraceptive method to delay her first pregnancy by one to two years; while only a third (31 percent) reported they would.

Almost two thirds (73 percent) of 723 husbands regarded 18-21 years as the ideal age when a woman should have her first child. However, it was found that in 43 percent of the cases, the woman had delivered her first child at an age before the age considered ideal by the husband; and

only less than a third (29 percent) had their first child when their husband thought was the ideal age. Hence, neither are husbands and wives talking about their reproductive health, nor are their contraceptive needs being met. The needs of this large proportion of young couples who do want to delay their first birth is being neglected by family planning programs.

Information from health workers indicated that the social context is changing. Many health workers felt that couples should be counseled to delay the first pregnancy by 12-18 months (after marriage/ *gauna*) and expressed that they would motivate couples to do so. For instance, almost half of the ANMs (48 percent) regarded that newly married women should be counseled to use OCP to delay their first birth. Moreover, 40 percent ASHAs and 42 percent AWWs reported that they would motivate couples to delay their first pregnancy without any incentive. For the rest, and average incentive of Rs. 351 was expected by ASHAs and Rs. 303 by AWWs (median was Rs. 200 for both).

Large Family Size Norm and Son Preference

Table 6.2 shows that there is a norm of a large family size. The median desired family size was three children and little less than one-fifth of women (16 percent) desired five or more children. Desired family size is quite large which is keeping the fertility rate high. For instance, 12 percent of women who had 3 children or more still wanted at least one more child (N=362). Till couples do not achieve their desired family size or till they have pressure from their family to have more

Table 6.2: Desired family size, reported by women

Desired family size	Percent
1	1.8
2	20.9
3	35.1
4	22.5
5	11.2
6+	4.8
Total	**2,937**

Source: Population Council, formative study, 2011.

children, they do not adopt any contraceptive method. For instance, the qualitative study (Aruldas et al., 2012) showed that women belonging from different socio-economic communities, such as scheduled castes (SC) and other backward classes (OBC) felt:

> I am not using any method since I want more children. I only have two. (SC, illiterate) (Aruldas et al., 2012, p. 122)

> I want to get sterilization done, but my husband, mother-in-law and father-in-law want another child. Hence, I am not using any method. (OBC, educated to Class 12) (Aruldas et al., 2012, p. 122)
>
> I have two children and I want to get sterilized but my mother-in-law wants me to have more children so I am not using a method. (SC, illiterate) (Aruldas et al., 2012, p. 122)

An analysis was done to examine the concordance between the response given by husbands and their wives. A moderate agreement was found (Kappa statistic=0.52, $p<.01$). For instance, in 45 percent cases, the husband and wife both reported that they did not want any more children and in 31 percent cases, both agreed to have another child. However, it cannot be said firmly from this table that they discussed among themselves about their desire. Further, analysis suggest that desire for son was more among wives (34 percent) than their husbands (24 percent) and the desire for daughter was similar (19 percent) among both of them.

It was found that there is a significant association between total number of desired children and sex composition of children (χ^2 test, $p<.01$). It appears that preferred sex composition of children was two sons and one daughter or at least one son and one daughter. Among women who had one son and one daughter and desired for at least one more child, most preferred a son over a daughter; i.e. 132 women wanted another son compared to 32 women who wanted a daughter (the rest had no sex preference). Moreover, a greater proportion of women who did not want a son were using a method (43 percent), than those who did want a son (14 percent) (z test, $p<.01$).

Table 6.3: Number of daughters men are willing to have for two sons (percent)

	Number of daughters willing to have				
	0	1	2	3+	Total
First son	8.8	26.5	36.8	27.9	68
Second son	23.5	39.7	26.5	10.3	68

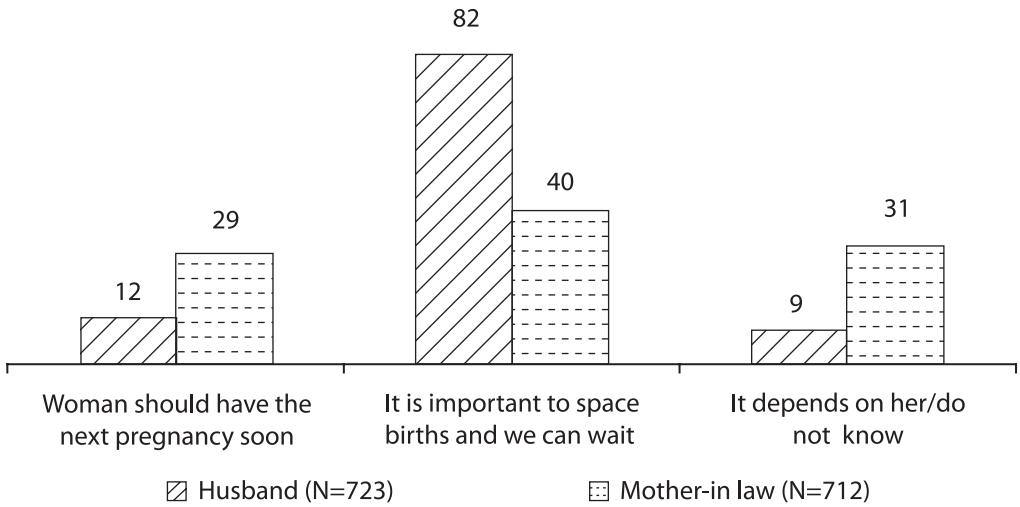
Source: Population Council, formative study, 2011.
Note: Among those who want 2 or more sons.

Table 6.3 clearly demonstrates strong son preference. According to the analysis, 28 percent of men were ready to accept three or more additional daughters to get at least one son, and 37 percent were ready to accept two additional daughters for at least two sons. In both the cases by the time couple get their desired sex composition, they will have a family of four to five children. As reported by a woman:

> I want another child. Once I have a son I will adopt a contraceptive method. (OBC, illiterate) (Aruldas et al., 2012, p. 122)

A large majority of husbands (82 percent) and more than a third of mothers-in-law (40 percent) had the view that their wife/daughter-in-law should space her birth or wait to have a son, if the first child is a daughter (Figure 6.5). However, a fair number of husbands (12 percent) and mothers-in-law (29 percent) did believe that their wife/daughter-in-law should try for a son soon after the birth of the first child if it is a daughter. The rest were undecided. Thus, to increase contraceptive use, in addition to strengthening delivery services and promotional work, the community has to be gender sensitized and the importance of small family size needs to be explained.

Figure 6.5: Acceptance of wife/daughter in-law to wait to have a son if the first birth is a daughter, reported by husbands and mothers-in-law respectively (percent)



Source: Population Council, formative study, 2011.

Half of the women (51 percent) reported that that they did not want any more children. Among them, one third (33 percent) had been sterilized; 13 percent were using a spacing method (either modern or traditional) and more than half of them (54 percent) were not using any method (Table 6.4). The main reasons why these women were not using a method were child too small (32 percent), menstruation had not started (14 percent), fear of side effects (12 percent) and not staying with husband (11 percent).The same reasons (except fear of side effects) also came from women who wanted a child after two years and were not using a method.

Studies show that couples who have a preference for sons tend to have their next child soon after the birth of a daughter (Hall et al., 2008; Setty-Venugopal and Upadhyay 2002). NFHS-3 data of Bihar show that among women with two children, 55 percent with two sons and 34 percent with one son were using family planning methods, compared to 14 percent of women with two

daughters and no sons (IIPS and Macro International, 2007). Another study from Madhya Pradesh showed that acceptance of contraceptive is found to increase as the number of living sons in the family increased. Moreover, women who are educated up to secondary level and higher and those who had full mass media exposure were less likely to have son preference compared to their counterparts (Gautam, 2010). However, recent studies are needed to strengthen empirical evidence in the changing social milieu of the state and in North India.

Table 6.4: Use of contraceptive methods by desire for children, reported by women (percent)

Desire for more children	Not using	Using			Total (N)
		Modern spacing	Modern permanent	Traditional methods	
Want more children	84.8	6.4	0.1	8.8	**1,436**
Do not want more children	53.9	6.0	32.7	7.4	**1,501**

Source: Population Council, formative study, 2011.

Unwanted Pregnancy

At the time of the study, 411 (14 percent) women were currently pregnant. Among them, 12 percent had a child less than 12 months; 18 percent had a child between 13 -17 months; 41 percent had their last child aged 18-24 months and the rest 29 percent had their last child aged more than 24 months. The reasons for wanting a child soon (among those who got pregnant within 24 months after last delivery) (N=125), was to have a son or a second son (50 percent); because either the woman herself, or her husband or her family wanted one.

Almost half (47 percent) of the currently pregnant women reported that they desired the pregnancy at that time. Conversely, half (53 percent) of currently pregnant women reported that they did not want this pregnancy at all or wanted it later (N=217). The reasons why they could not protect themselves from unwanted pregnancy by using a family planning method are shown in Table 6.5. The key reasons were (a) method related reasons such as lack of knowledge on how to use methods and fear of side effects (37 percent), (b) lack of knowledge of return of fertility (28 percent), (c) opposition from husband (28 percent), and (d) desired to have a son or one more son (24 percent). These reasons came out repeatedly in the qualitative study. One woman said:

> I wanted to have this child at least after three years but this pregnancy happened even before my menstrual cycle started. My child was small hence I made [sexual] relationship with my husband without using any method, because I never thought that I could get pregnant. I only realized that I was pregnant in the second month when I started vomiting. (OBC, illiterate) (Aruldas et al., 2012, p. 118)

Table 6.5: Reasons for not using family planning method in spite of wanting child later or not at all, reported by currently pregnant women

Reason	Percent
Fear of side effects/do not know how to use method or where to get it from	37.3
Lack of knowledge of return of fertility*	27.6
Opposition from husband	27.6
Pressure to have a son or 1 more son	23.5
Family pressure to have second child soon	12.4
Other**	12.0
Total	**217**

Source: Population Council, formative study, 2011.
Note: Percentage will not add to 100 due to multiple responses.
*Includes responses such as did not expect pregnancy since menses had not started or was breastfeeding. **Includes disapproval of method from self and method failure.

Acceptance of Birth Spacing and Practice of Birth Spacing

Most women and men reported that a gap of three years between a delivery and next pregnancy is ideal (Table 6.6). Similarly, most mothers-in-law (83 percent) reported that a gap of 2-3 years between births is ideal, while 12 percent thought a gap of more than three years is ideal. Very few (around 5 percent) thought a gap of less than two years is ideal. It is encouraging to note that from the qualitative and quantitative study, birth spacing is accepted and known to be good for mother

Table 6.6: Ideal gap between delivery and next pregnancy, reported by women and husbands (percent)

	Women	Husbands
1 year	2.5	6.4
2 years	22.1	32.2
3 years	29.9	35.5
4 years	45.4	25.9
Total	**2,598**	**653**
Mean (in years)	3.1	2.8
Median (in years)	3.0	3.0

Source: Population Council, formative study, 2011.
Note: Calculation of mean does not include all women/husbands, since some answers could not be subject to calculation; such as 'whenever pregnancy occurs'.

and child in the community because it helps the mother to give full care and attention to one child before the next child is born. Also, certain traditional practices also promote birth spacing. For example, it was found that on an average (median) couples abstain from sex for 60 days after delivery. About 11 percent couples reported that they had not started having sex after the delivery of their last child. Other studies also support that the advantages of birth spacing are well recognized and accepted in communities (Hall et al., 2008; Khan et al., 2008; Salway and Nurani, 1998).

A mother-in-law said:

> If there is a gap of two years between children, then the child [born] will eat well and get mother's love. It will be easy to take care of the child and the child will not trouble too much when the next child is born. Also, after two years the woman is not weak anymore; her body has recovered and she is ready to become a mother again. (OBC, educated to Class 5) (Aruldas et al., 2012, p. 117)

Another said:

> According to me there should be a gap of at least three years between two children as this helps to take care of the children properly and also the mother's health remains good. When pregnancy happens without a gap, then the child becomes weak. My daughter-in-law did not use anything and became pregnant again within a year after childbirth. I faced a lot of problem taking care of the elder child. (OBC, educated to Class 9) (Aruldas et al., 2012, p. 117)

While an ASHA said:

> My mother tells me that after delivery couples should not have sex for at least six months. If they do, mother's milk will get spoilt [doodh phat jayega] and will not benefit the child. I tell this to the community- that the child will stay 'healthy' if couples avoid sex so that the milk stays good for the child. (General caste, educated to Class 9)

The mean gap between the last birth and the second last child was around 32 months (S.D.=17.0; median=29 months). For almost two-thirds of women, the birth interval was more than 24 months as recommended by the WHO. The gap was less than 12 months for only less than 5 percent woman. Amongst those who wanted children (N=1,436) larger proportion of men (59 percent) than women (37 percent) wanted to wait for at least two years for next pregnancy; while the rest preferred to have the next pregnancy sooner or whenever it occurs (i.e. 41 percent men and 64 percent women).

Barriers to Adoption of Postpartum Contraception

The study found that 69 percent of currently non-pregnant women (N=2,526) were not using any contraceptive method. About 79 percent of women (N=1,234) who had delivered a child one year preceding the survey were not using any contraceptive method. The following paragraphs analyze various social and programmatic factors, which emerged as barriers to adoption of postpartum contraception from the quantitative and qualitative studies (Box 6.1). Barriers rooted in social norms such as large family size and son preference have already been discussed.

Box 6.1: Barriers to adoption of contraception

- Large family size norm and son preference
- Lack of knowledge of return of fertility
- Lack of correct knowledge on how to use modern spacing methods
- Lack of correct knowledge of traditional spacing methods
- Fear of side effects and misconceptions related to methods
- Low risk perception of closely spaced births
- Migration
- Poor access to methods and cost
- Poor supply of contraceptives available with community health workers
- Limited advice on family planning

Source: Population Council, formative study, 2011.

Lack of Knowledge of Return of Fertility

The main reasons for not using a modern method in the postpartum period were child too small (48 percent) and menstruation not started (42 percent). Further analysis shows that among those who said that their child is small (N=441) for only about half (54 percent), their child was actually small (less than 6 months in age).Among those, who reported their menstruation had not started (N=367), 49 percent had a child aged less than six months, and the rest 51 percent had a child aged 6 months or more. Therefore, since return of menses is considered as a marker of return of fertility, many women remained at risk of unwanted pregnancy since they did not use a method till their menstruation starts. A typical quote as the following was frequently mentioned. For instance one woman said:

> After delivery a woman can get pregnant only after six months to one year. Till the time the menstrual cycle does not start, pregnancy cannot occur. My menstrual cycle starts only after one year so why should I use a method before it returns. (High caste, educated to Class 9) (Aruldas et al., 2012, p. 118)

A similar view was held by a mother-in-law:

> After delivery, according to one's own body, some women get their menstrual cycle early and some get it later… immediately after menstruation starts a woman can become pregnant. Therefore some women get pregnant within six months of delivery and some after one year. (High caste, educated to Class 9)

Even husbands felt the same, such as this one:

> Only after the menstrual cycle resumes should we use a condom. We don't need it till then. (SC, educated to Class 7) (Aruldas et al., 2012, p. 119)

This can be further corroborated that among the 217 currently pregnant women who did not desire current pregnancy at this time, 8 percent became pregnant because their menstruation had

not started and hence, had not used a method. Moreover, less than 5 percent women and 9 percent men reported correctly that fertility returns six weeks after delivery. Most women and husbands believed that fertility returns after 4-6 months to a year as shown in Table 6.7.

Correct knowledge of return of fertility after delivery was low among community health workers also. About 8 percent ASHAs and AWWs, and 19 percent ANMs reported correctly that a woman's fertility return after six weeks. If 2-3 months are also included as right answer, still only approximately one third (39 percent ANMs, 33 percent ASHAs and 34 percent AWWs) had correct knowledge (Table 6.7).

From the qualitative study it was found that the concept of return of fertility among CHWs is expressed in months or year, rather than weeks. All ASHAs reported answers in months or years;

Table 6.7 : Knowledge regarding how soon a woman can get pregnant after delivery, reported by women, men and community health workers (percent)

Time	Women	Husbands	ANM	ASHA	AWW
After 6 weeks	4.8	8.9	19.0	8.4	8.2
2-3 months	13.0	18.8	20.4	24.1	25.9
4-6 months	25.0	21.7	18.2	26.9	22.6
7-12 months	17.5	14.5	14.6	22.2	18.1
After 1 year	18.7	19.9	13.1	15.1	18.1
Whenever menstruation begins	6.8	5.1	10.9	2.8	4.1
Do not know	14.2	11.0	3.6	0.9	2.9
Total	**2,937**	**723**	**137**	**212**	**243**

Source: Population Council, formative study, 2011.

the exact answer in weeks was not mentioned. Few ASHAs (6 out of 36) gave an almost correct answer by saying that fertility returns in a month, such as:

> A woman can get pregnant after one month of delivery; not before that because the post delivery related products [khoon-paani] is still inside her. (SC, educated to Class 10)

Another few said that fertility can return anytime. The rest however, gave incorrect answers:

> A woman can get pregnant after a year of delivery. Menstruation resumes after a year for some women and after two years for others. Till menstruation does not resume a woman cannot get pregnant. (SC, educated to Class 8)

In the qualitative study many ASHAs (21 out of 26) reported that there is no relationship between breastfeeding and delay in pregnancy. For instance, many ASHAs voiced the same, as this one:

> Breastfeeding cannot delay pregnancy. There is no relationship between them. (SC, educated to Class 10)

While almost half the ASHAs (47 percent), a third of AWWs (35 percent) and 12 percent ANMs reported that they did not know the conditions under which breastfeeding could delay pregnancy (i.e. the three conditions of LAM). Only 6-12 percent of CHWs knew LAM correctly (Table 6.10).The knowledge of LAM among women was also very low; only 7 percent women reported all three conditions of LAM. These simple messages can effectively be disseminated through a BCC strategy.

Lack of Correct Knowledge on How to Use Modern Spacing Methods

Awareness of contraceptive methods was quite high among women, husbands and mothers-in-law. For instance, 89 percent women and 91 percent men were aware of at least one contraceptive method. However, correct knowledge of methods was found to be very low. For instance, while 89 percent men were aware of condoms, only 54 percent knew how to use it correctly. Similarly, while 74 percent of women had heard of OCPs, only 30 percent knew how to use them correctly (Table 6.8). Most of those who were aware of a method, correctly knew if that method is used

Table 6.8: Comparison of awareness and correct knowledge of contraceptive methods, among women and men (percent)

Method	Women		Men	
	Aware of method	Knows how to use it correctly	Aware of method	Knows how to use it correctly
Condom	64.8	31.9	88.7	53.5
Oral Contraceptive Pills (OCP)	74.1	29.6	76.6	26.0
Copper T/IUD/loops	49.3	16.3	37.1	9.7
Injectable contraceptives	51.8	18.5	36.9	11.5
Safe period/ Rhythm method	54.7	25.4	27.5	5.0
Withdrawal	49.3	39.9	21.0	13.8
Total	**2,937**	**2,937**	**723**	**723**

Source: Population Council, formative study, 2011.

by men or by women. The knowledge of emergency contraceptive pills (ECP) was very low; less than 5 percent women had correct knowledge regarding what it actually is and how it is to be used (Table 6.9).

Though it is a part of the training of all health workers, knowledge of spacing methods was far from universal. For instance, only 61 percent ANMs, 57 percent ASHAs and 39 percent AWWs correctly said that an IUD can be inserted within two days or after six weeks after delivery by a

Table 6.9: Correct knowledge of ECP as reported by women

Correct response	Percent
Aware of ECP	4.8
Correctly know what it is	3.5
Correctly know that it is to be taken within 72 hours	1.2
Correctly know that there is one tablet	3.3
Ever used ECP	0.6
Knew that it is available with ASHAs/ANMs	1.5
Knew that it is available at PHC/CHC	0.6
Total	**2,937**

Source: Population Council, formative study, 2011.

trained provider. It is unfortunate to see that all ANMs did not know the correct time for inserting an IUD in the postpartum period because they are the only health workers who can reach to women and provide these services as a part of their tasks. Table 6.10 shows the percentage of CHWs who answered correctly regarding modern spacing methods.

Table 6.10: Correct responses of health workers regarding various modern spacing methods (percent)

Correct knowledge	ANM	ASHA	AWW
All three conditions of LAM	6.6	9.4	11.1
IUD can be inserted within 6 weeks after delivery[#]	60.5	56.6	39.1
OCPs can be started after 6 months of delivery	38.7	13.2	18.5
A pill should be taken as soon as possible if it is missed	43.8	45.3	39.5
Total	**137**	**212**	**243**

Source: Population Council, formative study, 2011.
Note: [#]Includes few correct answers of within 2 days by trained provider.

Not only was correct knowledge low; any CHWs reported that they did not know how to use methods correctly. For instance, 22 percent ASHAs and 30 percent AWWs did not know what to do if a pill (OCP) is missed. Similarly, 17 percent ASHAs and 23 percent AWWs did not know when an IUD can be inserted after delivery; and only a third of ANMs knew that an IUD could be used for up to ten years (33 percent). This clearly shows that CHWs were not promoting postpartum contraception correctly and completely and were just informing the community about methods available, since they did not know about the needs of postpartum contraception users.

Not more than 39 percent ANMs, 31 percent ASHAs and 28 percent AWWs knew the correct side effects of OCPs (Table 6.11). From the qualitative study, it was found that one of the main reasons for not using OCPs was fear of (incorrect) side effects and if CHWs themselves have that these (incorrect) side effects or myths, then they will not be able address concerns of women or promote this method effectively.

Table 6.11: Side effects women could experience after starting OCP, as reported by health workers (percent)

Side effects[#]	ANM	ASHA	AWW
Irregular bleeding	39.4	16.0	14.0
Absence of menstrual periods	12.4	15.1	11.9
Lighter/heavier periods	3.6	8.5	14.0
Headaches, breast tenderness, weight change	21.9	31.1	28.4
Dizziness	8.0	7.1	0.0
No side effects	0.0	1.9	4.5
Do not know	10.9	24.1	23.9
Total	**137**	**212**	**243**

Source: Population Council, formative study, 2011.
Note: Percentages add to more than 100 due to multiple responses.
[#] These are the typical side effects of OCP as per WHO (WHO and JHUCCP, 2011).

From the field it was observed that awareness of condoms, OCPs, IUDs and injectables was universal among CHWs. However, awareness and knowledge of ECP was quite low. Not more than 15 percent of ASHAs and AWWs were aware of ECP. However, a large proportion of ANMs (78 percent) did know about ECP, and most knew that it is to be taken with 72 hours and as a single dose pill. From the qualitative enquiry, few ASHAs (7 out of 36) reported that they had ever heard of ECP but only two knew what it was, though not all the details. For instance:

> We were told about ECP during the training. I think a woman should take it within 48 hours after having sex [with husband]. It prevents pregnancy from occurring. I don't remember the name of the pill. (OBC, educated to Class 10)

> I know about condoms, pills, IUD and injectables. I do not know what ECP is. (SC, educated to Class 8)

It also appeared that CHWs had misinformation about the contraceptive practices of the community. For instance, an ASHA reported that:

> Women generally adopt Copper-T in the postpartum period. (SC, educated to Class 8)

Lack of Correct Knowledge of Traditional Spacing Methods

The study also found that traditional methods were popularly used; and the most popular method was the safe day's method/rhythm method. However, only two of the 2,937 women (less than 1 percent) had correct knowledge of which were the safe days of the menstrual cycle. While, 40 percent did not know which were the unsafe days or safe days (unsafe days have been taken as the 10th to 12th day from the start of the menstrual cycle up to the 16th to 18th day for analysis and rest of the days have been considered as safe days); the rest had incorrect knowledge of which were the safe and unsafe days of the menstrual cycle. Among all women who were using traditional methods (N= 85), none correctly reported which were the relatively safer days. Incorrect use of the safe day's method, which is often practiced by couples, could also be a major reason for unwanted pregnancies, since both men and women often practice it incorrectly, i.e. have sex during the period when they need to abstain. More than a quarter of women (28 percent) mentioned that the unsafe period extends beyond nine days; such a long gap of abstinence may not be practiced in the community, hence, leading to unwanted pregnancy. A husband said:

> I do not sleep with my wife from the start of the menstrual cycle for 15 days. This is how we have spaced our previous children. (SC, educated to Class 5) (Aruldas et al., 2012, p. 119)

Similarly, a woman provided the wrong answer:

> I do not sleep with my husband for the first five days of the start of the menstrual cycle. (SC, illiterate)

On the other hand, for 90 percent of women, the first six days from the start of the menstrual cycle were regarded as unsafe. Hence, those who are using the safe day's method are at a risk of unwanted pregnancy. Moreover, 61 percent believed that a woman can get pregnant with unprotected sex if she is menstruating, which could be a reason why women avoid sex during menstruation and report unwanted pregnancy. Similar misconceptions were found among CHWs. For instance, 8 percent ANMs, 13 percent of ASHAs and 19 percent of AWWs reported that they did not know the safe days of the menstruation cycle. Amongst those who thought they knew the safe days, none of the ASHAs or AWWs knew correctly, and only 4 percent ANMs did. Studies also demonstrate that the safe period method is used incorrectly and neither is there a clear understanding among couples about most and least fertile days of a woman's menstrual cycle (Goel et al., 2010; Hall et al., 2008; Johri et al., 2005).

The use of traditional methods has continued to rise from 1.1 percent in 1992-93 to 5.6 in 2010-11. ANMs reported that the main reasons of increase in use of traditional methods are (i) fear or dislike of existing methods (35 percent), (ii) lack of knowledge how to use methods (27 percent), and (iii) difficulties in obtaining methods (23 percent). Studies from various countries show that traditional family planning methods are preferred over modern methods for several reasons, such as fear of side effects of modern methods (Blair et al., 2007; Goldberg and Toros, 1994, Laing, 1984; Ortayli et al., 2004), are convenient and locally available (Bertrand et al., 1985, Laing; 1984, Ortayli et al., 2004), faith in their effectiveness (Blair et al., 2007; Goldberg and Toros, 1994), low

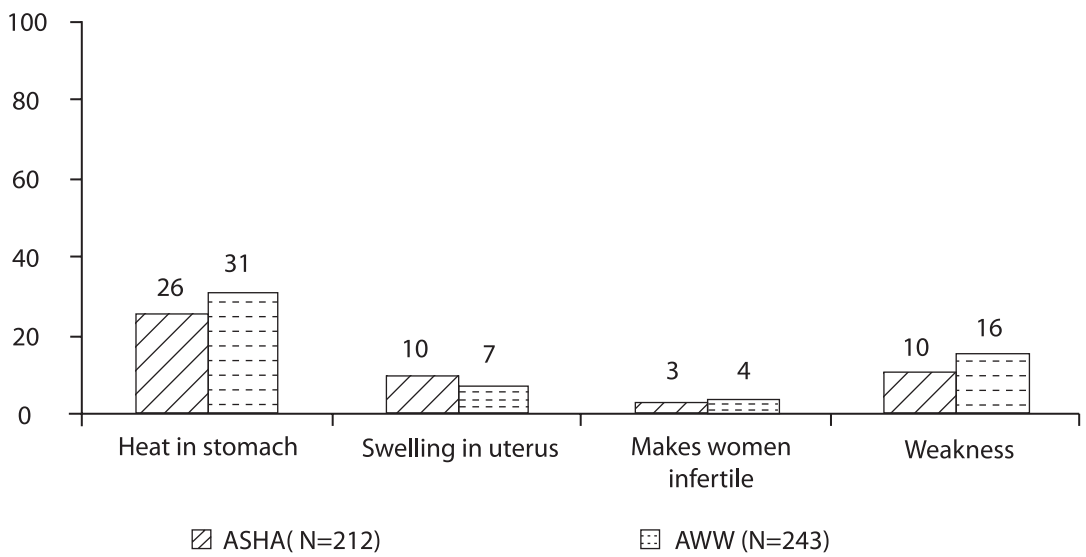
cost (Blair et al., 2007; Ortayli et al., 2004), opposition from husband (Goldberg and Toros, 1994), self-control is morally desirable (Hall et al., 2008) and because they are 'natural' (Ortayli et al., 2004).

Fear of Side Effects and Misconceptions Related to Contraceptive Methods

Among women who were not using any method, 13 percent reported fear of side effects as the reason for not using any modern method. Similar studies in the Uttar Pradesh show that women do not use OCPs because they feel that it makes the body feel hot, causes rashes and can lead to infertility with repeat use (Goel et al., 2010; Khan et al., 2007); IUDs are not used because it causes heavy bleeding and is believed to cause cancer and dislocate from the uterus (Goel et al., 2010; Khan et al., 2007); and condoms are disliked because they reduce pleasure (Khan and Patel, 1997). The qualitative study corroborates these findings. For instance women said:

> [Goli] OCPs causes diseases; everyone says that it causes swelling in the [bachaadaani] uterus. After using goli for sometimes, a woman can't become pregnant again unless she does not take treatment. My husband told me this. (SC, illiterate) (Aruldas et al., 2012, p. 120)

Figure 6.6: Misconceptions regarding the side effects that can be experienced after starting OCPs, as reported by community health workers (percent)



Source: Population Council, formative study, 2011.
Note: Percentages add to more than 100 due to multiple responses. Others include lack of hunger, skin problems, and effect on breastfeeding reported by less than 10 health workers.

> My husband will not let me get a Copper-T. I am also scared of having a Copper-T inserted… some women in my neighbourhood who had it inserted say that it burst inside and caused lot of bleeding and pain. I have seen one such case. I am scared to use [goli] OCPs because it causes heat in the body… all those who take it say so. (OBC, educated to Class 12) (Aruldas et al., 2012, p. 120)

Two mothers-in-law commented:

> I have seen that women who take Mala-D [OCPs] get their menstrual cycle twice a month, and their body becomes weak. And apart from Mala-D, I do not know about anything else [other methods]. (SC, educated to Class 5) (Aruldas et al., 2012, p. 121)
>
> I would not approve of my daughter-in-law using an IUD as it can cause cancer. (OBC, illiterate) (Aruldas et al., 2012, p. 121)

Husbands said:

> I feel disgusted by condoms and if goli [OCP] is given to the woman then she will not be able to conceive ever; I have heard an AWW say this in the village. (SC, illiterate) (Aruldas et al., 2012, p. 121)
>
> There is one reason why I do not like condoms; my sister's husband who was using condom got AIDS. (OBC, illiterate) (Aruldas et al., 2012, p. 121)

As reported by an ASHA:

> I have heard women in the community say that OCPs can cause cancer, so that's why they don't use it. (SC, educated to Class 9)

It was found that CHWs had misconceptions regarding contraceptive methods. For instance, many (26-31 percent ASHAs and AWWs) believed that OCPs cause heat in the stomach and weakness (reported 10-16 percent ASHAs and AWWs) as shown in Figure 6.6. Other myths reported were that OCPs cause swelling in the uterus, make women infertile and cause skin problems (reported by about 10 percent CHWs). If ASHAs do not have the correct knowledge to address these myths and misconceptions and poor counseling skills then they will not be able to carry out their role as an educator and motivator effectively.

Low Risk Perception of Closely Spaced Births

The study found that most women, men and health workers were not aware of the dangers of closely spaced births (pregnancy within 15 months of delivery). A large proportion of women, husbands as well as the health workers reported that 'woman becomes weak' as a disadvantage of having a pregnancy soon after delivery (Table 6.12). Less than 20 percent women and 25 percent ASHAs reported the serious consequences of short birth intervals, such as miscarriage, pregnancy complications and infant death.

Table 6.12: Disadvantages in becoming pregnant again within 15 months of previous delivery, reported by the family members and health workers (percent)

	Family members		Health workers		
Disadvantage	**Women**	**Husbands**	**ANM**	**ASHA**	**AWW**
Miscarriage	10.9	12.4	19.7	13.2	13.2
Still birth	12.8	21.7	10.2	16.0	13.2
Pregnancy complications	13.8	10.2	23.4	22.2	16.9
Low birth weight/ smaller baby	20.7	32.9	51.8	48.1	53.9
Child may die during delivery	8.1	12.0	15.3	17.9	18.9
Woman becomes very weak	59.1	74.1	80.3	81.1	85.2
Inadequate care of previous born child	1.6	4.7	38.7	1.4	0.0
Others*	0.3	0.8	5.8	0.5	4.9
No disadvantages/Do not know	30.8	11.1	0.0	9.4	5.8
Total	**2,937**	**723**	**137**	**212**	**243**

Source: Population Council, formative study, 2011.
Note: Percentages add to more than 100 due to multiple responses.
* Others includes anemia mostly said by AWWs and ANM and taking care of first child, mostly said by ASHAs. Only 1 ANM said that mother can die. Women and men mostly said dizziness, difficultly in breastfeeding.

Moreover, a few women, mothers-in-law, and husbands believed, if previous delivery occurred at an adequate interval, next pregnancy would also occur at a proper interval, by 'God's grace', hence using any contraceptive method was not necessary. The following quotes illustrate these barriers to postpartum contraception, such as a mother-in-law said:

> My daughter-in-law gets pregnant only after three years and she had not used any method; her next pregnancy will also occur after three years—this is God's will. (SC, illiterate) (Aruldas et al., 2012, p. 123)

A husband said:

> Without using any method I have been able to space all my four children- this is in God's hands. Now I have had enough children and will think about sterilization. (SC, illiterate) (Aruldas et al., 2012, p. 121)

Migration

Almost a third of women (31 percent) reported that their husband lives elsewhere. From the qualitative and quantitative study it was found that men mostly migrate to Patna, Delhi, Mumbai, Punjab, Gujarat, and other large cities and states for work, leaving behind their wives. Many women reported that they were not using a contraceptive method in the extended postpartum period because they were not staying with their husband (19 percent) as reflected in the quotes:

> My husband stays out for work so there is no need to use any method; when he comes back then we will think about it. (SC, illiterate) (Aruldas et al., 2012, p. 121)

> I am not using any contraceptive method. Soon after this delivery my husband left for a job to Punjab. For a brief period he was here after delivery and during this time we did not sleep together. Now he has gone. We have spaced the previous child [to this one] just by his going to Delhi or Punjab for work. (SC, illiterate) (Aruldas et al., 2012, p. 121)

Such short visits are more common among men working within Bihar and, particularly, in close by cities like Patna. However, at times when husbands return home, contraceptive methods are not used during his brief period of stay, leading to unwanted pregnancy. Educating such women about ECP could be useful, as often husbands' arrivals are unscheduled, and more often than not, they do not use any contraceptive method. In such cases, women could protect themselves from unwanted pregnancy and, then, persuade their husbands to use regular methods or move on to a regular method themselves.

Poor Access to Contraceptive Methods and Cost

Many women were not aware that most contraceptives are available with CHWs and/or at government health facilities for free. For instance, only 14-18 percent women reported that condoms and pills can be obtained from the PHC/CHC for free; while only 5-7 percent women thought that condoms and pills could be obtained from ASHAs. Only 45 percent husbands knew that condoms are available at the PHC for free. Around 54-66 percent women knew that one could purchase them from shops. The case was different for IUD and injectables. About 26-29 percent women reported that they were available at the PHC/CHC and 49-51 percent reported that they could be obtained from private doctors. Both the quantitative and qualitative studies show that more men were aware of where to obtain contraceptives than women. The quote below from a husband depicts poor access coupled with gender related norms which act as barriers to getting contraceptive methods:

> I have asked my wife to bring condoms from the ASHA as I feel shy to ask her directly. However so far she has not been able to get any. The ASHA has not come this side and my wife has not gone to the [tola] hamlet where the ASHA resides. (SC, illiterate) (Aruldas et al., 2012, p. 120)

Though the private sector appears to be a more popular source for obtaining a contraceptive method; cost restricts many to buy and use it. Cost of travel to purchase a method also emerged as a barrier. As reported by a few men:

> I haven't used a contraceptive method…. One has to go to the market at the block to buy condoms; that is why I do not use it. (OBC, educated to Class 8) (Aruldas et al., 2012, p. 120)

> Currently I am not using any family planning method; I do not go to the market to get it and it is not available in the village. My wife is also not using anything; family planning methods are available at the block. (High caste, educated to Class 10) (Aruldas et al., 2012, p. 120)

> These days we are not using any family planning method. No one gave us any information. However, the main reason for not using a method is that one doesn't get it for free. No one has ever given it to me free. It is available in the shop. If I buy from there it costs me Rs. 3 for one piece and if I buy four then it costs Rs.12. For this much money I can travel to Patna. Going to the PHC also costs money. (OBC, educated to Class 8) (Aruldas et al., 2012, p. 120)

Another woman echoed similar cost concerns if buying contraceptives—OCPs or condoms:

> It costs a lot to buy a contraceptive method…. I do not know how much. For this reason, we did not use condoms regularly and therefore this pregnancy occurred. (SC, illiterate) (Aruldas et al., 2012, p. 120)

It is crucial that methods are stocked with community health workers who are readily accessible and can make them available for free or at a minimal price.

Poor Supply of Contraceptives Available with Community Health Workers

Only about half of ASHAs (55 percent) and AWWs (50 percent) had ever been supplied condoms; while only a third had been supplied OCPs (Table 6.13). Among ASHAs and AWWs, 10-19 percent had condoms available at the time of the survey and 6-11 percent had OCPs; while most ANMs (84 percent) had both condoms and OCPs. The median number of condoms available with ASHAs and AWWs was 4-5, while it was 3-6 packets of OCPs and two pills of ECP. In the

Table 6.13: Stock of contraceptive supplies among health workers (percent)

	ANM			ASHA			AWW		
	Condoms	OCP	ECP	Condoms	OCP	ECP	Condoms	OCP	ECP
Ever supplied	NA	NA	68.2	54.7	36.8	3.3	49.8	33.7	2.5
Currently in stock	86.9	84.7	60.7	18.9	10.8	2.4	10.3	5.8	1.2
Mean (pieces in stock)	NA	NA	NA	8.6	4.4	3.4	11.7	5.5	2.3
Median (pieces in stock)	NA	NA	NA	4.0	3.0	2.0	5.0	5.5	2.0
Total		**137**			**212**			**243**	

Source: Population Council, formative study, 2011.

qualitative study, it was found that very few ASHAs (4 out of 37) had a stock of modern spacing methods. Those who had received them ever had not asked for it again after the stock finished. A few ASHAs (3) reported that they did ask for it from the PHC or the ANM and were told that they would be re-supplied but had not been till then. Voices from the field from ASHAs reflect the same:

> I don't stock any methods, but if people want them I get them from the PHC and give them. They are available for free there; if they were not then I would not get them for people. (General caste, educated to Class 9)
>
> Women who use OCPs get them from the market. They are not available at the PHC. (SC, educated to Class 9)

ASHAs are also supposed to be keeping ECP in their kit. While, less than 5 percent of ASHAs and AWWs had ever been supplied ECPs, a large proportion of ANMs have been supplied with ECP (68 percent). Most ANMs (81 percent) reported that they have IUDs currently in stock; and do insert it themselves (72 percent).

Information from the facility survey indicate that about 90 percent facilities (N=90) had sufficient (up to15 days) supply of condoms (at least 10 pieces) and IUDs (at least 10 packets) and about 80 percent facilities had OCPs (at least 15 packets) and ECPs (at least 10 packets). At 12 facilities, ECP was out of stock. Condoms were out of stock at only two facilities, OCPs at nine facilities and IUDs at six facilities.

Limited Advice on Family Planning

Only 57 percent women reported that ASHA had contacted them during the last delivery; and only 29 percent had met ASHA within seven days after delivery. Therefore, contact during the antenatal period was higher than during the postnatal period, when messages regarding postpartum contraception need to be reinforced and women require counselling. Only 10 percent ASHAs reported promotion of family planning among couples as one of their key roles; which shows that counseling on postpartum contraception is a neglected area by CHWs.

Moreover, less than 20 percent women ever received advice on family planning during their last delivery. Fewer men had ever received advice on family planning during their wife's last delivery (15 percent); mostly from ASHAs (9 percent) and doctors (4 percent). Some ASHAs and AWWs also mentioned that they do not talk to men about family planning (11 percent) or feel shy; while another few (less than 10 percent) tell women to speak to their husbands on contraception. However, a fair proportion of ASHAs and AWWs reported that they do advise men on family planning, including on condom use (34 percent to 58 percent), female methods (24 percent to 25 percent), advantages of family planning for mother and child (11 percent AWWs and no ASHA) and need for birth interval (6 percent to 11 percent). Hardly any ASHAs and AWWs have advised men on vasectomy (less than 5 percent).

Module three of the ASHA training program explains the importance of family planning and describes each contraceptive method; while Module five aims at building communication and negotiation skills of ASHAs. The study found that half of ASHAs had been trained on building communication and negotiation skills, for less than five hours, as reported by them. Moreover, only about half of ANMs (50 percent) and ASHAs (46 percent) had ever received any counseling

and communication aids and few ANMs (32 percent) and ASHAs (30 percent) had any counseling aids such as pamphlets, posters, flipcharts, booklets or models on birth spacing. Moreover, only 26 out of the 90 facilities had counseling aids for providers on family planning methods and only 12 had any counseling aids on ECP. Similarly, only 22 and 13 facilities had leaflets for providers on family planning methods and ECP respectively.

Facilitating Factors to Adoption of Postpartum Contraception

Having stated all the barriers, the study also identified some facilitating factors that could help increase use of contraceptive methods during the postpartum period (Box 6.2). Following are the details of such influential factors.

Box 6.2: Facilitating factors to adoption of contraception

- Exposure to mass media and messages
- Advice received from community health workers
- Spousal communication
- Education of women

Source: Population Council, formative study, 2011.

Exposure to Mass Media and Messages

A greater proportion of women who had exposure to any mass media (N=2,937) were using a family planning method (35 percent) compared to women had no exposure to any mass media (26 percent) (χ^2 test; $p<.01$). Among those who had heard of messages promoting birth spacing in the last 3 months (i.e. 15 percent women and 35 percent men), the leading source was mass media. Radio was mentioned as one of the prime sources for receiving such messages by 33 percent women and 56 percent men; followed by TV, as reported by 25 percent women and 31 percent men.

Mass media helps increase knowledge and attitudes about family planning and exposure to mass media and information education material (IEC) material has also shown to trigger discussion on family planning (Hamid and Stephenson, 2006; Khan et al., 2008; Mwaikambo et al., 2011; Sharan and Valente, 2002; Valente et al., 1994; Varkey et al., 2004). For instance, an intervention in Nepal showed that exposure to a radio serial drama on family planning had a significant impact on increasing spousal communication on family planning. Also, spousal communication and family planning use was higher among couples who took a joint decision on family planning methods than among couples where the husband or wife independently made the decision. The radio program may have helped to shift the power balance within marital relationships from husbands being the sole decision-makers to joint decision-making among couples (Valente et al., 1994). A

review of family planning interventions also showed that mass media is an appealing strategy to promote family planning because of its potential to reach an expansive audience and address issues in an entertaining and informative way which are otherwise a cultural taboo (Mwaikambo et al., 2011).

Advice Received from Community Health Workers

Table 6.14 shows that a greater proportion (34 percent) of women were using a method when they received advice on family planning more than once than those who did not receive any advice or those who received it once (26 percent).

Table 6.14: Contraceptive use by number of times advice received (percent)

Number of times received advise on family planning during last delivery	Not using method	Using method	Total
Received no advice	74.3	25.7	**2,365**
Received at least once, either during ANC or PNC	73.9	26.1	**115**
Received at least twice, both during ANC and PNC	65.9	34.1	**457**

Source: Population Council, formative study, 2011.
Note: χ^2 test value: 13.9; $p<.05$

Spousal Communication

The study showed that women who had talked about timing of next pregnancy or contraception after the last delivery, 50 percent were using a method as against 14 percent who had not talked to their husband. Logistic regression analysis also shows that those who talked to their spouse on contraception were six times more likely to use a contraceptive method (OR=5.70, $p<.01$) than those who did not (Table 6.16). Spousal communication was found to be significantly associated with education of woman, age at marriage, knowledge of family planning methods at the time of marriage, if discussion on timing of first pregnancy took place soon after marriage, type of household (nuclear) ($p<.01$) and standard of living ($p<.05$). Similarly, men who discussed timing of first pregnancy soon after marriage were four times more likely to have a discussion on contraception use after the last delivery and men who had knowledge of contraceptive methods at the time of marriage were twice more likely to have a discussion after the last delivery (Table 6.15).

Issues mainly discussed were which contraceptive method to use (48 percent), no desire for more children (43 percent) and when to have next child (26 percent). Among those who discussed which method to use (N=701), 42 percent women had adopted sterilization; while 10 percent were using modern spacing methods and 8 percent were using traditional methods. Among those

who discussed that they did not want a child (N=628), only 41 percent were using a method; and among those who discussed when to have next child (N=376), 85 percent had a child aged 6 months or more.

Table 6.15: Results on the logistic regression analysis on spousal communication (reported by husbands)

Variable	Category	Odds Ratio
Type of family	Joint®	
	Nuclear	0.85
Education of husband	No education®	
	Primary (1-5)	1.08
	Secondary or higher	2.42**
Discussion at time of marriage	No®	
	Yes	4.21**
Knowledge of methods at time of marriage	No®	
	Yes	2.63**
Exposure to mass media	No exposure®	
	Exposure to at least one media	1.69**
	Yes	

Source: Population Council, formative study, 2011.
Note: Dependent variable is 'discussed contraception with wife after last delivery'.
*$p<.05$; ** $p<.01$

The key reasons for not discussing timing of next pregnancy or contraceptive use after the last delivery (reported by 50 percent; N=1,462) were husband never initiated discussion (28 percent), shyness/hesitation or culturally these talks are not are not encouraged (25 percent) and felt no need to discuss (23 percent). Among those women, who felt no need to discuss, more than a third (40 percent) wanted a child within two years or were already pregnant. Studies have found that couples do not feel the need to discuss fertility and contraception as reproduction is perceived to be a 'natural' process that does not need to be discussed (Acharya and Sureender, 1996; IIPS and Macro International, 2007; Khan and Patel, 1997; ORG, 1990). From the qualitative study, it emerged that couples had varied reasons for why they did not feel the need to discuss contraception. For instance, husbands said:

> I did not talk to my wife about contraception since I wanted another child. (SC, educated to Class 10)
>
> There is no need to discuss family planning since my wife thinks the same as I do. (OBC, educated to Class 8)

> My wife's menstruation has not started, so I did not initiate any discussion on contraception. (General caste, educated to Class 5)
>
> We don't need to talk about all this [family planning]. It all depends on God. (General caste, educated to Class 8)
>
> We will wait [to talk] till we do not complete our desired family size. Till I do not have 6 six children, I don't think I need to talk about contraception with my wife. (SC, illiterate)

Some women reported:

> I did not feel the need to discuss contraception since my husband and I are currently not having sex. (SC, illiterate)
>
> My husband stays away most of the time, so contraception is hardly talked about. (OBC, illiterate 10)

Women also regarded lack of knowledge as a reason preventing them to talk about family planning:

> I don't know anything about contraceptive methods, how can I begin talking about it myself? (OBC, illiterate)
>
> We both [my husband and I] are illiterate and don't know about family planning, so what will we talk about? (SC, illiterate)

Spousal communication needs to start early, such as soon after marriage. The study found that only a third of couples had any discussion soon after marriage (35 percent). The key reasons for not talking soon after marriage, as reported by women were shyness (45 percent), felt no need to discuss (40 percent) and husband never initiated discussion (36 percent). Women continue to perceive that it is the man's role to initiate such discussions and it is culturally tabooed that women should initiate talk on sex and contraception. But only about a third of husbands (39 percent) actually had ever initiated discussion on family planning.

Education of Women

Age and education of women were found to be strongly associated with adoption of a family planning method (χ^2 test: $p<.01$). Logistic regression analysis (Table 6.16) shows that women with higher education and belonging to households with high standard of living were more likely to use a method compared to their counterparts, although the odds ratios were not statistically significant. Similar results were found from logistic regression analysis of the same variables on use of modern contraception (Model 2 in Table 6.16).

Discussion and Implications for the BCC Strategy

The use of postpartum contraception remains far below the national average. In the last 18 years, we see only a rise of 20 percent points; which is around a percent point per year. There is little use

Table 6.16: Results on the logistic regression analysis on postpartum contraception

Variable	Category	Odds Ratio Model 1	Odds Ratio Model 2
Individual and family level			
Education of women	No education®		
	Primary	0.92	0.93
	Secondary or higher	1.18	1.09
Sex composition of children	Daughters and sons are equal in number®		
	Daughters more than sons	1.03	1.03
	Sons more than daughters	0.67**	0.64**
Spousal communication regarding FP after last delivery	No®		
	Yes	5.70**	5.82**
Standard of living index	Low®		
	Medium	0.91	0.88
	High	1.13	1.04
Exposure and advise/program level			
Exposure to mass media	No exposure®		
	Exposure to at least one media	1.28	1.18
Exposure to birth spacing messages in last 3 months	No®		
	Yes	0.80	0.85
Advise ever received on FP	Received no advice®		
	Received at least once, either during ANC or PNC	1.07	1.23
	Received at least twice, both during ANC and PNC	1.25	1.32

Source: Population Council, formative study, 2011.
Note: Dependent variable in model 1 is using any method..
Dependent variable in model 2 is using any modern method. *Reference category; *p<.05; ** p<.01

of modern spacing methods, despite many women wanting to space their births. Interestingly, the use of traditional methods is little higher than the use of modern spacing methods. The key barriers for not using any method are lack of knowledge of return of fertility, lack of knowledge

on how to use methods correctly, fear of side effects, large family size norm and son preference, low risk perception of dangers of closely spaced births and poor access and cost. While many of these barriers could be addressed by simple BCC interventions, others are rooted in social norms and would take more time and effort to change.

Changing social norm is a challenge. According to Lapinski and Rimal (2005), behavior which is done away from the public eye, such as condom use is more difficult to change, than behavior done in public. When behavior is done privately, one knows that his/her behavior is not observable to others, hence there is limited pressure to conform and limited imposition from social sanctions. The authors argue that condom use is a privately enacted behavior and thus, more difficult to change (than publicly enacted behavior) with interventions designed for normative change. With increasing women's education and exposure to mass media, the tenacity to conform to fertility related social norms such as son preference may decrease.

It was also found that the supply of contraceptive methods with CHWs is low; their knowledge of return of fertility, LAM and when to adopt postpartum methods is far from universal. Neither do they promote postpartum contraception actively, nor do they have the counseling skills to motivate couples to adopt contraception. On the other hand, education of women, standard of living, spousal communication and exposure to media and messages on family planning were found to be associated with adoption of postpartum contraception. To design an effective BCC strategy for postpartum contraception, the following issues would need to be considered:

Media Mix

The reach of mass media in rural Bihar is low—86 percent of women and 69 percent of men have no exposure to any mass media in rural Bihar. Hence, interpersonal communication with community health workers should be the lead medium for reaching to the community, particularly women. Mass media could reach the more educated and better off sections of the community, who could work as 'early adopters' to trickle down the behavior (Rogers, 1962).

Initiating Spousal Communication

Several studies show that spousal communication is positively associated with the use of contraception (Acharya and Sureender, 1996; Feyisetan, 2000; Klomegah, 2006; Lasee and Becker, 1997; Link, 2011). However, spouses often discuss contraception only after completing their desired family size when they are ready to adopt a permanent method like sterilization (IIPS and Macro International, 2007; ORG, 1990). Conversely, limited spousal communication may make women wrongly perceive that their husband opposes to a method (Bongaarts and Bruce, 1995) or even overestimate each other's demand for children hence, discourage method use (Link, 2011). Many women reported that they are either shy to discuss family planning with their husbands or wait for their husbands to initiate such discussions. Different models have been developed and

tested on how to initiate spousal communication and could be adapted to the cultural context of rural Bihar. Moreover, spousal communication needs to be initiated soon after marriage and innovative ways can be used for couples to 'break the ice' and talk about sex and contraception.

Increasing Male Involvement in Contraception

Several studies have shown that it is crucial to involve men in family planning (Hall et al., 2008; Khan and Patel, 1997; Varkey et al., 2004). Men are more likely to take part in family planning once the need for it is made clear to them (Feyisetan, 2000). However, community health workers do not talk to men about contraception, as it is not a norm in the community to discuss such matters with men. According to Rogers (1962), more effective communication occurs when the source of information and the recipient of information are homophilous[8]. Hence, using male key influencers and peers in the community could be effective ways to talk to men and motivate them to discuss contraception with their wives, address their worries and fears and motivate them to adopt contraception. Men not only have more exposure to mass media, but also have access to mobile phones (Khan et al., 2012). Innovative ways to reaching men could also be explored, such as using mobile phones to reach to them with messages or triggering them to discuss such messages with their wives.

Increasing Counseling on Contraception During Postpartum Visits

Very few CHWs advise on contraception during ANC and PNC. Studies have shown that postpartum women are unlikely to return to the service delivery point because of limited access to medical facilities, inadequate transportation and women's limited mobility outside the home (Khan et al., 2004; Winikoff and Mensch, 1991). The only way to reach women in the postpartum period is though antenatal and postnatal visits (Conde-Agudelo and Belizán, 2000; Daniel et al., 2008; IIPS and Macro International, 2007; Varkey et al., 2004). However, postpartum visits are hardly made by CHWs. Messages need to be repeated, healthy practices need to be reinforced and women need to be followed up once they have adopted a method, to ensure continuation and address problems if any. Health care providers find it time-consuming to motivate low-parity couples to adopt family planning because they want to have children soon (Khan et al., 2007) and may not recommend birth spacing. The effectiveness of incentivizing postpartum visits so that the ASHA can advise on family planning (along with a package of behaviors) needs to be explored. *Panchayati raj* institutions (PRIs) can be used to monitor and supervise visits made by CHWs.

[8] According to Rogers, homophile is the degree to which paired in individuals who interacts are similar in certain attributes such as beliefs, values, education, social status and so on.

Incentivizing Postpartum Contraception

The importance of spacing between births has never been promoted by the family welfare program like sterilization. Perhaps, that is why the use of permanent methods is higher than the use of modern spacing methods. Sterilization has been heavily incentivized for both the health worker who motivates the client and to the client. But the adoption of postpartum spacing methods such as the IUD is poorly incentivized and the fact that this method is incentivized is also not known in the community. The success of the recent pilot project announced by the Government of India to make ASHA a depot holder of contraceptives[9] in 233 districts (of which are 36 district are in Bihar) will be show interesting results regarding the need for incentivizing spacing methods. Panchayati Raj Institutions (PRIs) and self-help groups (SHGs) could be mobilized to facilitate this process.

Improving Knowledge, Counseling Skills and Coordination Between Health Workers

CHWs lack correct knowledge of return of fertility, details on how to use methods available and LAM. Such knowledge gaps need to be addressed. Various myths exist in the community and little effort has been made to address these, such as fertility returns with the onset of menstruation, OCPs make the body feel hot and which are the safe days. These myths can only be addressed though improved and effective counseling. Similarly, health workers need to promote beliefs that already exist in the community such as birth spacing and use of traditional methods if modern methods are inaccessible. Community perceptions such as spacing helps take care of last child and provide adequate resources to the last child should be promoted. Such perceptions will be easily accepted, than new messages such as serious (biological) consequences of short birth intervals for mother and child. Indeed, the message should be better health of mother and child but messages on the socio-economic benefits of spacing would be more appealing to the community as they are interlinked with the social norms of the community.

The level of knowledge of among ASHAs, AWWs and ANMs varies. ANMs have more knowledge than the other two health workers. Coordination between health workers could also be promoted so that knowledge sharing between them is improved. ANMs seem to have most methods in stock and regularly meet ASHAs and AWWs; however ASHAs and AWWs report low stock of methods. Hence, increased coordination will help them discuss stock position and re-supply methods if necessary. Ways to increase supportive supervision and coordination between these health workers can need to be strengthened.

[9] Under this pilot project, ASHAs will charge Rs. 1 for a pack of 3 condoms, Rs. 1 for a cycle of OCPs and Rs. 2 for a pack of a tablet of ECPs from beneficiaries as an incentive of her efforts. Free supply of these contraceptives would be withdrawn from the PHC and sub-center level. The pilot will be implemented in 233 districts in 17 states.

Focus on Young Couples and Women Whose Husbands are Migrants

The family welfare program continues to neglect the needs of young couples and newly married couples. The study showed that many women do not use any method to delay first pregnancy largely because of pressure from family; rather than because they want a child soon. With increasing education and exposure to mass media, a greater proportion of couples will express desire to delay the first pregnancy. Many women do not use regular methods since their husbands do not stay with them. In such situations, women are not prepared for an unexpected arrival of their husband. Increasing provision of ECP will help prevent unwanted pregnancies in such situations.

The study also identified that research gaps which require further exploration such as why traditional methods are preferred, why couples do not feel the need to discuss contraception and how men can be effectively reached and motivated to talk to their wives on contraception. Simple proven BCC efforts can increase postpartum contraception among those who really need it; though community norms such as large family size and son preference will take time to be change and long term efforts.

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SEVEN

Increasing Compliance to Complete Immunization of Children in Rural Bihar

Jaleel Ahmad and M. E. Khan

Introduction

As per National Family Health Surveys (NFHS) and District Level Household Surveys (DLHS) Bihar is one of the low performing state in full immunization[10] coverage in India. In 2007-08 (DLHS-3) full immunization rate in rural Bihar was 42 percent. Subsequently there is a shift in strategy under National Rural Health Mission (NRHM) and in October 2007 Routine Immunization (RI) services were introduced in the outreach mode in Bihar through mission named *"Muskan ek Abhiyan"* (The Smile Campaign) with an objective to enhance 100 percent Routine Immunization (RI) coverage of children 0-5 years and of TT for pregnant women by strengthening RI and introducing outreach services which are held twice a week in an area – one day at the *aganwadi* center and other day in another part of the village (Goel S, et. al. 2011).

The current evaluation of NRHM (2009) shows quantum jump in full immunization coverage in rural Bihar and in last five years proportion of fully immunized children has increased from 30 percent in 2005-06 to 54 percent in 2009. The coverage has improved among all segments of the population and faster among the socially vulnerable groups, the poor and illiterate.

Bihar government has made concerted effort during the last four years by integrating Department of Health and Family Welfare, Integrated Child Development Scheme (ICDS) of Department of Women and Child Development and UNICF to improve immunization coverage. Did it really work and if so to what extent and if not why?

Literature review has shown several key reasons for non-vaccination and partial immunization of children in India. These include mother's lack of knowledge about vaccine preventable diseases (VPDs), fear of side effects, child being sick on the scheduled immunization day and problem related to access (Desai et al., 2003; IIPS, 2006; Khokar et al., 2005; Kar et al., 2001; Mathew et al., 2002; Nath et al., 2007; Punith et al., 2008;). A recent study in Uttar Pradesh (UP) by the Population

[1] Under Government of India immunization schedule a child is considered to be fully immunized if received a dose of BCG, 3 doses of OPV and DPT and one dose of Measles.

Council (PC) also suggested various reasons for low acceptance and adoption of recommended schedule of vaccination and facilitating factors that operates at the level of individual, family, community and health system. The UP study by the Population Council (PC) also pointed out unreliability of services and providers, limited counseling by health workers, lack of coordination among frontline health workers were some of the major barriers in completing recommended schedule of vaccination (Ahmad et al., 2010 and 2012).

Objectives

Taking into consideration the similar context of Bihar with UP, the Population Council conducted a formative study in Bihar in 2010-11 to assess:

- Level of knowledge and perception of stakeholders (women, husbands, mothers-in-law and frontline health workers) regarding vaccine-preventable diseases, vaccines and their schedules
- Facilitating factors in acceptance and adoption of full immunization
- Barriers in following recommended schedule of vaccination
- Role played by the frontline health workers in promoting full immunization and challenges they faced

Methodology

The formative study was conducted in two phases. In the first phase, 317 in-depth interviews were conducted with family-level stakeholders, health care providers and *panchayat* members. Qualitative study was conducted in 24 villages: eight villages each from three selected districts located in three different regions. In second phase, a survey was conducted covering 2,941 households, 2937 currently married women aged 15-34 years who had delivered a child in three years preceding the survey, 723 husbands, 712 mothers-in-law, 212 accredited social health activists (ASHAs), 243 *anganwadi* workers (AWWs), 137 auxiliary nurse midwives (ANMs), and staff at 90 government health facilities (primary health centers [PHCs] and community health centers [CHCs]) from 150 villages in nine districts spread across the nine administrative division of Bihar. Some of the findings of secondary analysis of NFHS, DLHS, NRHM and qualitative findings given in this chapter have been taken from the study published by Sage Publications (Khan et al., 2012). Details of study design and data collection methods have been discussed in introduction to this book.

Findings

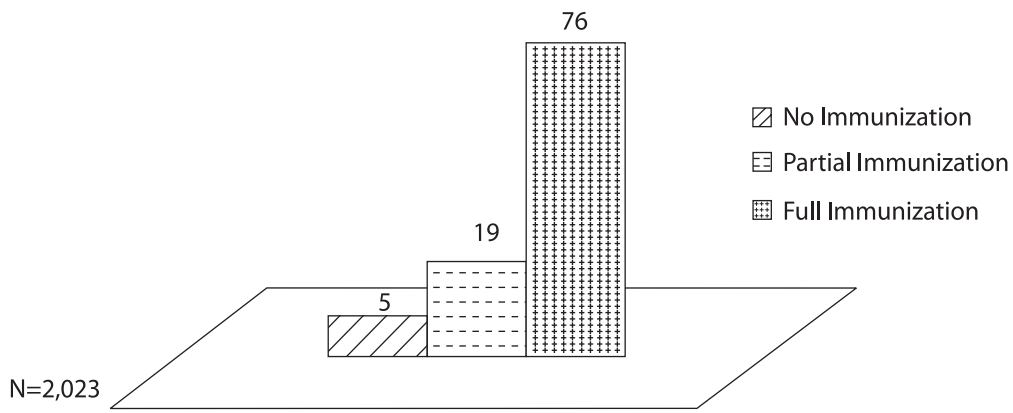
Current Status

The findings of the formative study show that out of the 2,937 women interviewed, 91 percent reported that they had vaccinated their last child against various vaccine preventable diseases (VPDs).

Currently 76 percent of children aged 12-23 months were fully immunized, 19 percent partially immunized and rest 5 percent were not immunized at all (Figure 7.1). The findings indicate improvement in full immunization across all districts /region of Bihar but with variation in coverage.

While the high rate of immunization is very encouraging, two questions are raised. First, is the steep increase in the last two years if true or has it been inflated by the health care providers? Second, what factors have helped in sustaining increase in full immunization coverage over time? To answer the first question, immunization coverage was estimated in two different ways— one, if the immunization card was available that was taken as the main source of data. If the family has not maintained or was not provided immunization card, women was interviewed and immunization coverage was estimated.

Figure 7.1: Immunization status among children aged 12-23 months (percent)



Source: Population Council, formative study, 2011.

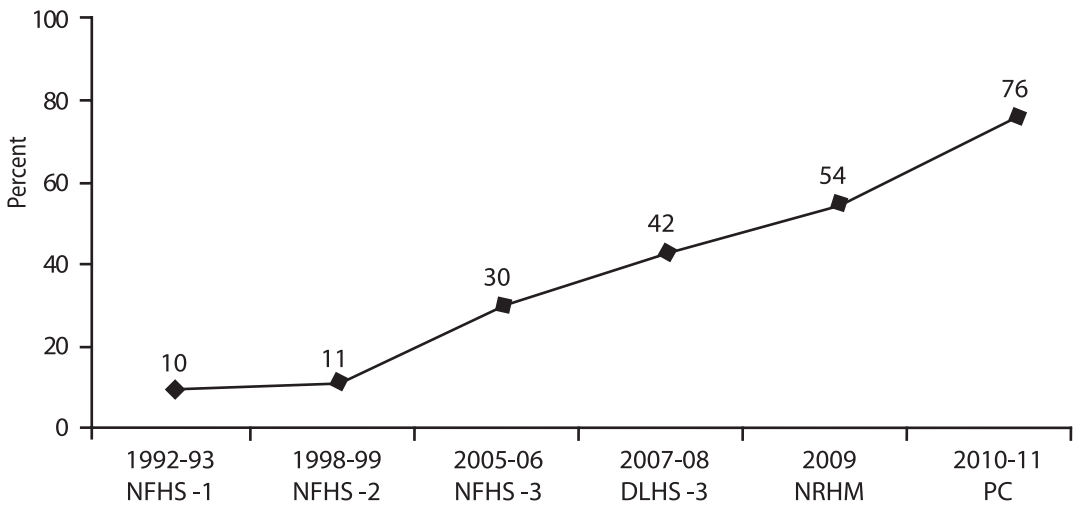
Analysis showed that full immunization coverage calculated from immunization card was 87 percent, while estimate based on verbal reporting of women, was 62 percent. Giving allowances for some underreporting on the part of women and mistake/inflation in filling the immunization record by the health care providers, the true value is perhaps lie somewhere in between 67-68 percent. It looks reasonable as the UNICEF Patna has estimated it also around 67 percent.

Trends in Immunization

The trend of full immunization in rural Bihar is quite encouraging. It has accelerated from 2005 onwards when 30 percent of children were fully immunized (NFHS-3); and increased to 42 percent in 2007. Thereby it has increased to 54 percent in 2009 and 76 percent in 2010-11. Increase

of 46 percentage points in six years is mainly because of Bihar government's effort to achieve universal immunization of children. Currently almost eight out of every 10 children are fully immunized (Figure 7.2).

Figure 7.2: Trend in full immunization coverage among children aged 12-23 months



Source: Reanalysis of NFHS-1, NFHS-2, NFHS-3, and DLHS-3, NRHM; and Population Council, formative study, 2011.

Relative Disparity in Immunization

The findings indicate that full immunization coverage has improved among all segment of population. However, rate of increase is much faster among marginalized groups and the disparity has reduced substantially between general and scheduled caste, high and low SLI and secondary or higher educated versus illiterates (Table 7.1).

Background Characteristics of Women and Immunization Status

The analysis shows that full immunization was positively associated with woman's background characteristics like religion, education, parity and standard of living (Table 7.1). Programmatic indicators like number of ANC a woman received during pregnancy, place of delivery and exposure to any mass media are important factors and were also found to be significantly associated with full immunization coverage (Table 7.2).

Table 7.1: Relative disparity in full immunization by religion, caste and class (percent)

Categories	Full immunization 2005-06*	Relative disparity	Full immunization 2010-11**	Relative disparity
Hindu	33.9	**35.7**	78.6	**18.8**
Other religion	21.8		63.8	
General caste	34.0	**36.2**	79.7	**-1.8**
SC/ST	21.7		81.1	
High SLI	61.3	**72.6**	83.8	**15.3**
Low SLI	17.0		71.0	
Secondary or higher education	59.1	**62.6**	84.0	**12.7**
Illiterate	22.1		73.3	

Source: NFHS-3 and Population Council, formative study, 2011.
Note: *NFHS-3 (N=891), ** Population Council data (N=1,023).

Table 7.2: Full immunization among children aged 12-23 months by selected individual and program variables

	Full immunization	Total	χ^2 test p-value
Type of family	Percent	N	
Nuclear	74.5	491	**.124**
Joint	77.8	532	
Religion			**.000**
Other religion[1]	63.8	163	
Hindu	78.6	860	
Caste[3]			**.040**
SC/ST	81.1	244	
OBC	73.7	646	
Others	79.7	133	
Age of woman			**.316**
15-19	76.2	42	
20-24	78.2	395	
25-29	76.7	387	
30-34	71.4	199	
Education of woman[2]			**.012**
No education	73.3	675	
Primary	78.2	133	
Secondary/higher	84.0	215	

Table 7.2 Continued

Table 7.2 Continued

	Full immunization	Total	χ^2 test p-value
Children ever born			**.001**
1	81.7	219	
2	79.2	255	
3	78.4	222	
4+	68.8	327	
ANC visit			**.003**
0	65.4	127	
<3	75.6	406	
3 & more	79.6	**490**	
Sex of the last child			**.021**
Female	73.2	462	
Male	78.8	561	
Place of delivery			**.000**
Home	66.5	457	
Institution	84.1	566	
Standard of living index			**.002**
Low	71.0	397	
Medium	77.9	453	
High	83.8	173	
Exposure to any mass media			**.029**
No	75.1	869	
Yes	82.5	154	
Total		**1,023**	

Source: Population Council, formative study, 2011.
Note: Analysis is based on currently married and usual resident women aged 15-34 years who had given birth in the 12 months preceding the survey.
1. Other religion includes mainly Muslims, Christians, Sikhs and Jains.
2. Education: Primary education refers to completion of 1-5 years of schooling, Secondary education refers to completion of 6- 12 years of schooling; Higher refers to completion of education of more than 12 years
3. SC=scheduled caste; ST=scheduled tribe; OBC=other backward caste.

Facilitating Factors to the Uptake of Full Immunization

The facilitating factor for complete immunization is highlighted in Box 7.1. The coordinated efforts of government of Bihar have resulted in significant positive impact on full immunization of children. For example introduction of "*Muskan ek Abhiyan*" that used following strategies to strengthen the RI campaign:

Box 7.1: Facilitating factors

- *Muskan ek Abhiyan* campaign
- Regular observance of immunization days
- Coordinated effort by ASHA and AWW
- Awareness of women about vaccines, place and immunization day
- Awareness of next course of action if child missed a dose
- High risk perception among family members of getting diseases if child not fully immunized
- Advice by frontline health workers on immunization

Source: Population Council, formative study, 2011.

- ***Reviewing and strengthening the micro-plan by ANMs*:** ANMs prepare a micro-plan with the support of ASHAs and AWWs, by identifying and listing each family, where either a child or woman is eligible for immunization. The geographical areas of the village are divided and allocated among different ASHAs and AWWs. They in turn mobilize children in their own allotted areas using a "due list" generated from the tracking register. The registers are updated on the same day or at latest by the next immunization session.
- ***Monitoring of immunization services*:** UNICEF appointed one RI coordinator per district to support government officials in monitoring and strengthening immunization services. District coordinators review the timing of immunization sessions, supplies, due list, number of children immunized, quality of services, etc., and report their observations to the Medical Officer. These observations are further discussed by the Medical Officer In-Charge at the monthly meeting with the workers and action is taken to improve the system. In 2011, UNICEF coordinator's responsibility shifted to Medical Officers at the district level.
- ***Performance based incentive to health workers*:** In phase one of *Muskan*, an incentive of Rs. 200 per month each for the AWW and ASHA and Rs. 150 for the ANM was provided for coverage above 90 percent of the children on the "due list" and Rs. 100 each for the AWW and ASHA and Rs. 75 for the ANM for 80-90 percent coverage in their area. For coverage of less than 60 percent, explanations were sought in their weekly and monthly review meetings. Under phase two, the incentive for the AWW and ASHA has been revised to Rs. 200 each per session for more than 21 beneficiaries, Rs. 150 for 16-20 beneficiaries, Rs. 100 for 11-15 beneficiaries, and Rs. 50 for 5-10 beneficiaries. Similarly, the incentive for vaccinators (i.e., ANM) was Rs. 100 per session for 15 and more beneficiaries and Rs. 50 for 1-15 beneficiaries. The payment/incentive for performance is a big motivating factor for the workers and they take mobilization of children much more seriously.
- ***Special campaign for measles vaccination*:** A month-long drive for measles vaccination is conducted in each district to cover the drop-outs and left-outs. Seven teams, one for each

district, were formed to cover seven districts at a time. Once these districts are covered in one month, these teams move to the next seven districts for a month to do the mopping up operation for drop-out children. As the maximum drop-out takes place at the time of measles vaccination, covering them thorough mopping up has direct bearing on the full immunization rate.

The present study also supported the impact of *muskan* program and apart from that, following are some other facilitating factors that contributed to steep increase in full immunization coverage.

Regular Observance of Immunization Days and ensuring Supplies

The findings show that most (97 percent) of the villages had *anganwadi* centers and 90 percent had at least one ASHA. Over 90 percent of women reported that they vaccinated their child within the community and majority (77 percent) of cases in *anganwadi* centre and rest 13 percent either in sub-centre, village health camp, school, *panchayat gha*r. In the qualitative study, AWWs of different villages also mentioned that they had regular immunization sessions in their community. Further, almost all (95 percent) ANMs reported they had adequate supplies of all vaccines. Provision of regular services within the community has increased access and perhaps also acceptance of immunization.

The literature has also shown that if place of immunization is outside the community, there is unreliability of services and providers unavailability, which might deter families from taking their children to the centre to complete full immunization schedule (Banerjee, 2010).

Coordinated Effort by ASHA and AWW

Findings in the qualitative study across all the study districts show that both ASHA and AWW work together and divide their responsibilities on immunization day. Both of them mobilize

Table 7.3: Support provided by AWW on immunization day reported by ASHA

Type of support	Percent
Identification and mobilization of children for immunization	78.3
Roam around along with AWW on immunization day	9.4
Motivate caregivers for immunization	11.3
Identify and follow up on left out children	3.8
Write the date of immunization on the card	1.4
No support	15.1
Other	2.3
Total	**212**

Source: Population Council, formative study, 2011.
Note: Percentages may add to more than 100 due to multiple responses.

children in their respective allocated areas and complement each other's work. In villages, where ASHAs and AWWs complement each other's work, immunization performance was found to be good. More than three-fourths of ASHAs reported that they received support from AWW to identify and mobilize children for immunization (Table 7.3). Following are some of the quotes from AWWs explaining how they work together.

An AWW said:

> ASHA work with me and she makes home visits and mobilizes women to bring their children for vaccination. (OBC, educated up to Class 10)

Another AWW said:

> On immunization day ASHA and I visit each house in the village and bring children to the centre for immunization. (OBC, educated up to Class 12)

Similarly ASHAs had also mentioned good coordination with AWWs. As an ASHA said:

> AWW and I work together on immunization day and she is also advised to cover all children for vaccination. (SC, educated up to Class 10)

Another ASHA said:

> I have good relationship with AWW and we meet daily. Whenever I need any information I ask her. (OBC, educated up to Class 9)

Awareness of Fixed Immunization Days

Out of the total women interviewed 63 percent were aware of fixed immunization days that are organized in their village. Full immunization coverage was 10 percentage points higher among children of those women who were aware of fixed immunization day as compared to those who were not aware and the difference is statistically significant (z-test, $p<.01$).

Frontline Workers are Key Motivators and Credible Source of Information on Immunization

Among women who vaccinated their last child (N=2,680) around half them reported that they were supported and motivated to immunize their child by ASHA and AWW (Table 7.4). The findings also indicate that women often depend on ASHAs and AWWs for information on schedule of vaccination of their child, day and timing of immunization session. Around 46 of women reported ASHA and 25 percent reported AWW as the person who informed and reminded them about day and timing of immunization session whenever it happened in the village. This reflects the credibility of ASHA and AWW in the community.

The qualitative findings also show that most of women had fully vaccinated their children because they were consistently reminded by ASHA and AWW about the day and timing of immunization session.

A typical statement made by some of the women was:

> My child can be protected from diseases by vaccination....So it is necessary to vaccinate the child…. I am vaccinating my child because the AWW and ASHA informed me it is very necessary. (OBC, illiterate) (Aruldas et al., 2012, p. 132)

Table 7.4: Person who supported and motivated for child immunization, as reported by women

Motivated by	Percent
Self (woman)	24.0
Husband	18.1
Mother-in-law	23.8
Friends and relatives	21.7
Doctor/LHV/Nurse	9.0
ASHA	49.9
AWW	41.1
Others	0.3
Total	**2,680**

Source: Population Council, formative study, 2011.
Note: Percentage may add to more than 100 due to multiple responses.

> ….the ASHA tells us about the timing of immunization and also informs us about the next scheduled day for vaccination and place of vaccination. (SC, educated up to Class 12) (Aruldas et al., 2012, p. 132)

> Whenever there is immunization session in the village, ASHA informs all of us and we go for immunization. (OBC, illiterate)

Advice Received From Frontline Health Workers on Immunization

Above 90 percent of women reported that they had received at least one advice from service provider (including ANM) related to vaccination of their child, during the last time they vaccinated their child. On an average, a woman received 5 different advices from frontline health workers and the most important was that 83 percent of them received advice on next schedule of vaccination of their child and 68 percent on side effects and their management which seems to be the major concerns of caregivers about immunization (Table7.5).

Table 7.5: Types of advice received from service providers during last vaccination of their child reported by women

Advices received	Percent
Name of vaccine given	51.8
Diseases protected by the given vaccine	44.6
Side effects of vaccination	68.1
Management of side effects	68.4
Next schedule of vaccination	82.6
To keep immunization card	89.6
To bring immunization card	89.7
Total	**2,680**

Source: Population Council, formative study, 2011.
Note: Percentages may add to more than 100 due to multiple responses.

Further analysis shows that percentage of fully immunized children is much higher (87 percent) if women received advice from health worker on immunization against (70 percent) if women did not receive any advice (z-test, $p<.01$). Women who received advice on next schedule of vaccination were three times more likely to fully immunize their children as compared to who did not receive such advice (Table 7.8). The qualitative finding also suggests that health workers did advice women on immunization. As one of the woman said:

> ASHA came to my house to inform that immunization is happening and advised me to take my child for vaccination. She also informed about place and next schedule of vaccination. (High caste, educated up to Class 2).

In in-depth interviews some of the ASHA also mentioned that they provide information about diseases, timing and action to be taken if child missed a dose to women and as one of them said:

> If a child misses dose then we counsel parents about benefits of immunization and inform them about diseases like pertusis, tetanus, measles their child can get. (SC, educated up to Class 8)

Similarly another ASHA said:

> If a child misses a dose, we advice parents to get their child vaccinated for the missed dose as soon as possible. (OBC, educated up to Class 8)

Awareness of Women About Next Course of Action if Child Missed a Dose

The findings show that around two-thirds of women were aware of correct step that child should be vaccinated on the next immunization day or ask health provider (23 percent) for advice if they missed a dose (Table 7.6). Further analysis suggest that the proportion of fully immunized children (83 percent) was much higher among women who were aware of correct course of

action is child missed a dose compared to those who were not aware (58 percent) and the difference in proportion is highly statistically significant (z-test, $p<.01$) (Table 7.8).

Table 7.6: Awareness among women about action to be taken if child misses a dose of vaccine on a scheduled day

Actions	Percent
Child should be given that dose on the next immunization day	73.4
Ask ASHA/AWW/ANM for advice	22.8
Start immunization fresh again	5.5
No need to give that particular dose again	3.9
Nothing could be done/do not know	15.6
Total	**2,937**

Source: Population Council, formative study, 2011.
Note: Percentages may add to more than 100 due to multiple responses.

ANC Visit, Place of Delivery and Immunization

The findings suggested that there is a significant association between number of ANC visit made by women and full immunization of their children. Women who received three or more ANC among them 80 percent children were fully immunized whereas who did not get any ANC among them 65 percent of children were fully immunized (chi test, $p<.01$). Similarly women who delivered their last child in institution among them 84 percent of children were fully immunized as compared to those who had home delivery among them 66 percent were fully immunized and the difference in the proportion is also statistically highly significant (z-test, $p<.01$). This clearly indicates the impact of *Janani Bal Suraksha Yojana* (JBSY) on uptake of immunization in Bihar. Since ASHA is supposed to motivate pregnant women for ANC and institutional delivery, frequency of contact with women also increases and that in turn increase chances of dissemination of information on immunization. It also becomes easy for her to motivate women and track their eligible children for immunization.

High Risk Perception of Getting Diseases Among Family Stakeholders

About 65-70 percent of the family members believed that there is high risk to the health of child and perceived that child may get diseases if not fully vaccinated (Table 7.7). The analysis further shows that percentage of fully immunized children was higher (81 percent) among those who perceived high risk, compared to those who perceived no or low risk (65 percent) and the difference is statistically significant (z-test, $p<.01$). The findings also suggest that as number of persons perceiving high risk in the family increases full immunization also increases among children.

Table 7.7: Risk perception among family members of a child getting sick, dying, or becoming handicapped if not fully immunized (percent)

Perception	Women	Husbands	Mothers-in-law
No risk/it all depends upon God/Do not know	15.3	8.0	19.2
Some risk	14.6	23.7	15.9
High risk	70.0	68.3	64.9
Total	**2,937**	**723**	**712**

Source: Population Council, formative study, 2011.

The findings show that if none in the family perceive any risk to the child if not fully immunized among them 58 percent of children were fully immunized and it increases 71 percent when either women or her husband perceive high risk. The percentage of fully immunized children further increased to 79 when both woman and her husband perceive high risk which is quite similar to the findings in Uttar Pradesh (Ahmad et al., 2010).

The qualitative study also reflects that despite low level of awareness about VPDs, doses and other immunization related information full immunization coverage was high because of perceived high risk to the health of child if not fully immunized among family members. Some of the mothers explained their concern if child is not vaccinated in the following ways:

> Yes I feel that if child is not fully immunized then child will fall sick, but I don't know the name of the disease. (OBC, illiterate)
>
> Yes I know that if we do not vaccinate the child then child can suffer from polio. (OBC, illiterate)

Similarly mothers-in-law had also recognized the risk to the child if not fully immunized as they said;

> Full immunization protects child from diseases but I do not know which are the diseases that can be protected. I only know about polio. (OBC, illiterate)
>
> Child can still be protected from diseases by God if not fully immunized, because child fall sick even after vaccination. (High caste, educated up to Class 7)

Determinants of Full Immunization

A multivariate regression analysis was done to identify key facilitating factors and determinants of full immunization. The results (Table 7.8) show that women who were aware of all four vaccines that need to be given to the child for complete vaccination were two and half times more likely (OR=2.6, $p<.01$) to fully immunize their child, compared to those who were not aware any vaccine. Similarly, chance of full immunization of child was three times more (OR=3.0, $p<.01$) if mothers were aware of the correct course of action in case child missed a dose. Many of these factors identified are programmatic and could be strengthened for greater impact.

Table 7.8: Results of logistic regression analysis on full immunization

Characteristics		Odds Ratio
Religion		
	Other religion®	—
	Hindu	2.15**
Place of delivery		
	Home®	—
	Institution	1.88**
Advice received during counseling on immunization		
	No®	—
	Yes	1.72**
Risk perception of getting diseases		
	No Risk®	—
	High risk	1.41*
Awareness of vaccines		
	Not aware of any vaccine®	—
	Aware of all 4 vaccines	2.56**
Aware of correct action if child missed a dose		
	Not aware®	—
	Aware	3.01**
Awareness of fixed immunization day		
	No®	—
	Yes	1.47*

***Source*:** Population Council, formative study, 2011.
***Note*:** Analysis based on last born child aged between 12-23 months among women aged 15-34 years. Dependent variable; Full immunization (Yes=1, No=0).
®Reference category, *p<.05, **p<.01

Barriers

The barriers to full immunizations are highlighted in Box 7.2. Despite an impressive increase in the full immunization coverage during the last two years among children aged 12-23 months, still around one-fourth of them were not fully immunized. The reasons for no and partial immunization at different levels as emerged out in this study are presented in Table 7.9 and has been discussed in details in the subsequent sections.

Box 7.2: Barriers

- Lack of knowledge among family members about vaccination
- Fear of side effects of vaccination
- Lack of support in the family women being busy in work
- Unaware of place and timing of immunization and non-availability of vaccines
- Poor tracking of new born and drop outs
- Lack of counseling skills among frontline health workers.

Source: Population Council, formative study, 2011.

Individual and Family Level

Lack of Knowledge of Among Family Members About Vaccination

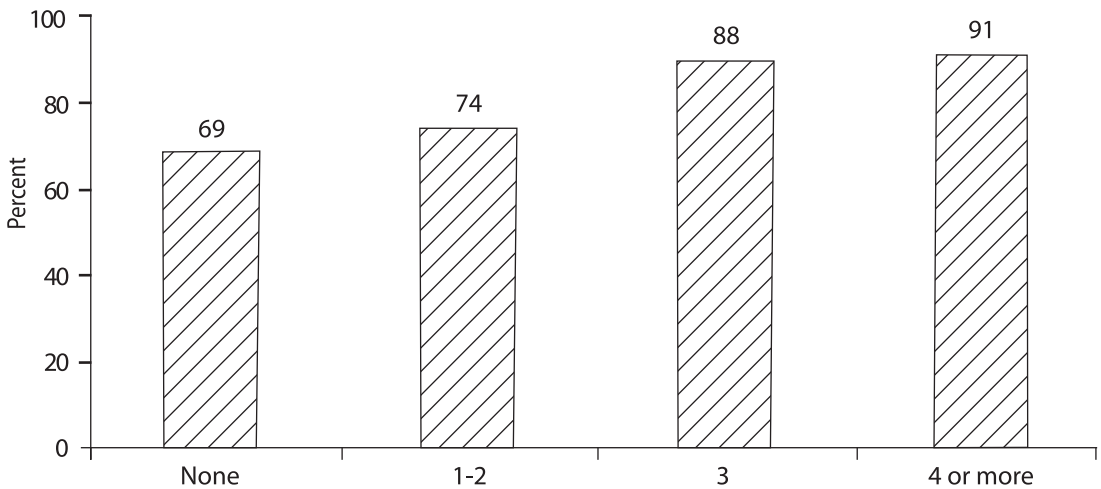
The analysis shows except for polio (65-71 percent) knowledge of other VPDs among all family members was found to be very low. Less than half of the women (44 percent) were aware of all 4 vaccines required for complete immunization and only 17 percent were aware of correct age of the child at which different vaccines were to be given. Lack of knowledge about immunization was one of the more common reasons mentioned by 22 percent of women who had not completed vaccination of their child (Table 7.9). The analysis further indicates that as the knowledge of number diseases increases among women percentage of fully immunized children also increases (Figure 7.3).

Table 7.9: Reasons for no and partial immunization of child reported by women

	Reasons	Percent
Program	Lack of knowledge	22.3
	Fear of side effects	22.3
	Child was sick	18.0
	No support (no one to take the child)	6.9
	Missed and discontinued	5.6
	Lack of faith	5.6
	Parents too busy	4.7
	Family moved	4.3
	Others (forget card)	7.3
Individual	Unaware of timing	23.2
	Unaware of place	4.7
	Vaccine not available	6.9
	Place too far	4.3
	Inconvenient timings	2.6
	ANM absent	2.6
	Others	1.2
	Total	**243**

Source: Population Council, formative study, 2011.
Note: Percentages may add to more than 100 due to multiple responses.

Figure 7.3: Women's knowlege of VPDs and full immunization among children 12-23 month (N=1,023)



***Source*:** Population Council, formative study, 2011.

Qualitative findings also suggest lack of knowledge of diseases, doses and vaccines among family members. Some of the quotes given below show the level of knowledge about VPDs and vaccines among women:

> I do not know which disease child can get if not vaccinated...I do not know immunization happens in my village and I only know that polio vaccine is given in the village. (High caste, illiterate)

> After BCG vaccination at the hospital I did not vaccinate further because I did not know when the child needs to be vaccinated again. (SC, educated up to Class 7)

There was also lack of knowledge about VPDs among mothers-in-law and husband. As one of the mother-in-law said:

> Vaccinations are given to protect child from diseases, but I don't know for which disease it is given. (High caste, educated up to Class 8)

One of the husbands said:

> Child can get diseases if not fully immunized but I do not know which diseases child can get. (OBC, educated up to Class 6)

Fear of Side Effects of Vaccination

Fear of side effects like child developing fever, swelling or pustule due to vaccination was the main concern and 22 percent of women reported it as a reason of partial immunization of their child (Table 7.9). Around 36 percent of each ASHAs and AWWs also reported fear of side effects among family members as one of the main reasons of drop out in their communities. In-depth interviews of women showed that due side effects of vaccine, their child cries a lot which hinders their daily chores. As one of the woman said:

> I fear that the child will develop pustule and get fever. Any such problem will be a problem for me. (SC, illiterate)

Some of the mothers-in-law (5 of 48) expressed similar concern. One of them said:

> Some people if their children experience any side effect do not continue to vaccinate their child because they fear that child would again get fever, cry a lot and will create problem to them. (OBC, illiterate)

Similarly ASHAs and AWWs also reported fear of side effects among family members as a reason of drop out from vaccination. As some of the AWW said:

> If a child gets fever after vaccination then their family stops next doses of vaccination. (OBC, educated up to Class 10)

An ASHA said:

> ….the family complains that the child cries a lot after the injection and does not allow them to work, so they drop out after one dose of vaccination. (SC, educated up to Class 10) (Aruldas et al., 2012, p. 128)

Lack of Family Support and Being Busy with Work

Of the women who had partially vaccinated their child, seven percent reported 'lack of support' and five percent 'busy in work' as reasons of partial immunization of their child. Qualitative findings also indicate that women from low socio-economic strata in rural Bihar often work as laborers in the fields and take their child along with them. They complained lack of support in the family to take the child for vaccination when they go to work. A woman living alone with an infant said:

> I am alone at home and do not have any support to look after my child. My husband works out of the village so I could not take my child for vaccination. (SC, illiterate) (Aruldas et al., 2012, p. 128)

Another woman said:

> I have not vaccinated my child at all because child is healthy and I have to go to work then who can take the child for vaccination. (OBC, illiterate)

Some mothers-in-law (10 of 48) also had the same opinion that women were busy either in domestic chores or work in the field and therefore could not take their child for vaccination. One of them said:

> ….women do not get time to immunize their children because they even carry their small child with them to the field…. (SC, illiterate) (Aruldas et al., 2012, p. 129)

Visit to Maternal Home or Other Places

Few women (5 percent) and quite a large number of ASHAs (48 percent) and AWWs (69 percent) reported that temporary visit of women to their maternal home or some other place as a reason for not completing vaccination schedule. In the qualitative study it was repeatedly mentioned by women as the cause for partial immunization and both ASHAs and AWWs also mentioned that it becomes difficult for them to track the child for completing immunization if the family moves out of the village. Some of the typical quotes from women as follow:

> I went to my maternal home with my child, so I did not remember when the child needs to be vaccinated again. (SC, educated up to Class 6)

> My daughter has not received DPT 3 because at that time I went to my maternal home and also forget to take the card. But I will get my child this dose on the next Wednesday. (High caste, educated up to Class 10)

Health workers also mentioned temporary migration of women as one of the main cause of drop out children from vaccination. As one of the AWW said:

> ….when families move to some other place then their children drop out from immunization…. (High caste, educated up to Class 10)

An ASHA also voiced the same view:

> ….those who move out of the village are not able to complete immunization.… (SC, educated up to Class 10) (Aruldas et al., 2012, p. 128)

System Barriers

The findings suggest that supply issues have improved and above 95 percent of ANMs had reported regular supply of vaccines and no stock out problem. However, following are some of the issues which need to be addressed at the health system level.

Unaware of Place and Timing of Immunization and Non Availability of Vaccine

Although immunization schedule in the village was reported to be regularly organized, still 23 percent of women reported they had not completed the schedule because they were not aware of timing of immunization schedule and about five percent were not aware of place of immunization in their village. Non availability of vaccine on the scheduled day was reported by seven percent of women as a reason of partial immunization of children.

Poor Tracking of Newborn and Drop-Outs by Providers

Although ASHAs and AWWs play vital role in increasing full immunization coverage through community mobilization, still they lack systematic approach to identify and track newborns. Only 34 percent of ASHAs and 45 percent of AWWs reported that they made due list of children for vaccination and 12 percent of each reported they identified newborns in their area and kept track of those children. In response to a question about their roles in immunization, only 6-10 percent of ASHAs and AWWs mentioned 'identification and follow up of drop outs' as one of their role (Table 7.10). One of the ASHAs reported:

Table 7.10: Methods adopted in tracking drop out of children reported by ASHA and AWW

	ASHA	AWW
Methods	**Percent**	**Percent**
Make home visits and inform parents who missed their dose	53.8	55.6
Make due list of children schedule for vaccination	34.4	44.9
Inform families to remain in the village on immunization day	33.5	32.5
Make home visits and ensure child is vaccinated on next immunization day	24.1	45.7
Identify newborn and keep track	11.8	11.5
Inform families to bring their children on next immunization day	9.9	16.5
Others	4.2	1.2
Total	**212**	**243**

Source: Population Council, formative study, 2011.
Note: Percentages may add to more than100 due to multiple responses.

> I do not know methods how to keep track of those who drop out from vaccination. (OBC, educated up to Class 10)

Lack of Skills in Counseling and Management of Side Effects

Although 73 percent of women reported they had received one or other advice on immunization from frontline health workers, still 29 and 24 percent of ASHAs and AWWs respectively reported that they found difficulty in counseling women on side effects of vaccination (Table 7.11).

Table 7.11: Difficulties in community mobilization on immunization day reported by ASHA and AWW

Difficulties	ASHA Percent	AWW Percent
People remain busy in their work they do not want to come	36.3	46.5
Difficult in counseling on side effects	29.2	23.9
Difficult to make home visits	12.7	25.5
Difficult to track those who moved out of the village	8.5	15.6
ASHA does not provide any support	—	2.9
Others (specify)	13.2	16.5
Total	**212**	**243**

Source: Population Council, formative study, 2011.
Note: Percentages may not add to 100 due to multiple responses.

During in-depth interviews it was observed that due to lack of counseling skills they were not able to convince mothers to continue vaccination if child develops side effects like fever or pustule after vaccination. They were apprehensive in dealing with complaints from women about the side effects of vaccination which are clearly reflected in the following quote from an ASHA:

> ….if a child develops fever or a pustule then it is difficult to counsel families to complete immunization. (SC, educated up to Class 8)

Another ASHA also has same apprehensions in promoting full immunization:

> I am afraid to tell people that a child can develop fever or a pustule after vaccination. (OBC, educated up to Class 5) (Aruldas et al., 2012, p. 130)

Discussion and Implications for the BCC Strategy

Study findings show that three fourth children in rural Bihar were fully immunized and full immunization coverage has improved across all districts/regions of Bihar but with variation in coverage. The trend analysis indicates there has been a quantum jump in full immunization in last

two years. It increases from 54 percent in 2009 to 76 percent in 2011. The study also indicates that full immunization has improved among all segment of population and rate of increase is much faster among marginalized groups and the disparity has reduced substantially between general and schedule caste, high and low SLI and secondary or higher educated versus illiterates. Among the background characteristics women's religion, education, parity and standard of living were significantly associated with full immunization. Apart from background characteristics of women some of the programmatic variables such as ANC, institutional delivery and advice given by health workers are significantly associated with full immunization and were major predictor of full immunization.

The study has pointed out several facilitating factors which lead to increase in full immunization coverage and barriers why still quarter of children had not completed their schedule of vaccination. The major factor in uptake of full immunization was found to be the strategies adopted in "*Muskan ek abhiyan"* campaign by strengthening of RI services and performance based incentive backed by strong monitoring and supervision mechanism keep the interest and motivation of health workers intact in promoting immunization.

The findings suggest that more than ninety percent of villages have ICDS centers with availability of ASHA and AWW and immunization sessions are regularly organized in the villages and over 95 percent of ANMs reported regular supply of vaccines. The literature also showed that availability of immunization services at community level increases the likelihood of full immunization coverage and immunization rate could be improved by improving reliability of services (Banejee et al, 2010, Khan et al., 2011).

The synchronization of ICDS with health sector has increased reliability of services and availability of service providers at the community level to guide and support family in utilization of immunization services. The linkages of immunization services with other maternal and child health services have also been emphasized by WHO and UNICEF in Global Immunization Vision and Strategy (GVIS) 2006-15 (WHO and UNICEF, 2005).

The other major factor in uptake of immunization in Bihar is positive role played by frontline health workers particularly ASHA in mobilizing community for immunization which raises their credibility in the community. People have started to depend on them for information on health issues and support to access health services. Almost half of the women referred frontline health workers as their preferred source of information on full immunization that also reflects their credibility among them. The findings show that ASHAs and AWWs mobilize family members and remind them before and on the days of immunization. The regular contact of ASHA and AWW with the community and their coordinated effort could have resulted in increase in uptake of immunization. JBSY has played a significant role in bringing community closer to health service providers and have positive impact on immunization coverage. ASHAs play an important role in motivating women for ANC and institutional delivery and this ensures regular contact with mothers for a longer period of time and increases chances of dissemination of information on immunization

of children. A randomized control study has also shown that discussion lead to knowledge transfer and this simple intervention significantly increases the uptake of vaccination (Anderson et al., 2009).

Apart from programmatic interventions under *Muskan,* findings have also shown that risk perception to the health of the child if not fully immunized is quite high among all family members in Bihar compared to the findings of UP (Ahmad et al., 2010) and that is forcing them to complete the vaccination of their child.

Although full immunization rate in Bihar is positive and encouraging with increasing trends but still there are issues which need the attention of policy and program managers. Findings show that both ASHAs and AWWs lack in providing counseling, convincing caregivers to continue vaccination in case mothers complain of side effects. There is also lack of systematic approach of identification of eligible children for vaccination, tracking and follow up of drop outs. These are some of the major areas of concern to address for sustenance of acceptance of immunization and accelerate the uptake of full immunization.

The barriers and facilitating factors in uptake of immunization identified in the present study could be utilized for designing a BCC strategy based on the BCC framework developed by Population Council (Population Council, 2011).

Audience Segmentation

Although full immunization is increasing faster, even among disadvantaged groups, the full immunization rate for children from less educated and Muslim groups is lagging behind, and more attention should be paid to these population segments. Similarly, some of the populations living in small remote villages need to be covered with immunization services.

Dissemination of Comprehensive Information on Immunization

Fear of side effects is a big barrier that many cited as the main cause of partial immunization, despite the presence of a strong community mobilization program. A focused BCC campaign to educate community and family members about immunization and its side effects needs to be developed. Family members are primarily aware of the risk of polio infection, and there is a need to increase knowledge about other vaccine preventable diseases.

Capacity Building of Frontline Health Workers

Findings suggest that ASHAs and AWWs have high credibility among families and they often depend on these health workers for information and guidance on health issues. However, ASHAs and AWWs lack competency-based technical and counseling skills. To make interpersonal communication (IPC) more effective, frontline workers need to be trained, their self-efficacy needs to be strengthened, and they should be provided a simple check list to facilitate their work.

Communication and Counseling Channels

Communication channels should include a mix of media, led by IPC efforts from the large network of ASHAs and AWWs, to reach priority audiences, including women, their husbands and mothers-in-law. The Village Health and Nutrition Day (VHND) is an effective forum to inform clients and reinforce messages about immunization and other health behaviors. However, there is a need for consistent messages and more information on immunization and maternal and child health during VHNDs, ANC visits, discharge from the facility after delivery, and other contacts with the family.

Use of Mobile Phones

Ownership and accessibility of mobile phones among providers as well as among all sections of the society has increased and this has given an opportunity to capitalize the mobile phone technology in health sector too. Number of experiments on utilization of mobile phones in health sector has shown positive impact on access and utilization of services. This has also been used as monitoring and supervisory tool. Most ASHAs and ANMs have a mobile phone and also reported its use in their work. Thus mobile phones could be used as a tool to disseminate information and reminders through voice and text messages (e.g. next scheduled immunization day).

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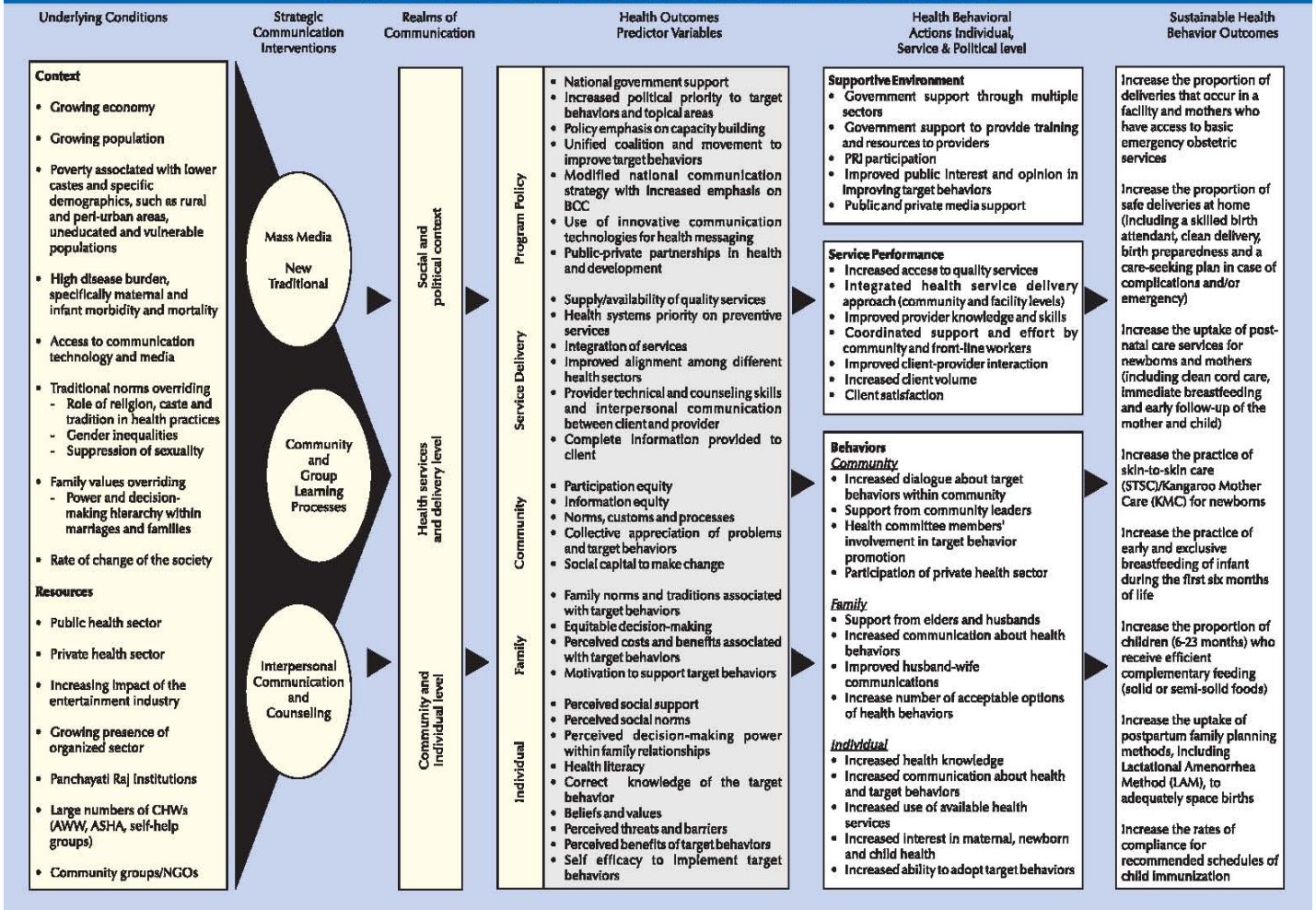
Annexure 1

FIGURE 1
Pathways communication model for to improve reproductive, maternal, neonatal, child health and nutrition outcomes



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Reproductive, Maternal, Neonatal and Child Health and Nutrition indicators have remained poor in India, with various factors contributing to continued mortality and morbidity. Communication strategies play a powerful role in addressing the barriers to, and shaping demand for, the adoption of preventive health practices.

Based on an in-depth study, *Shaping Demand and Practices to Improve Family Health Outcomes* provide valuable information on family dynamics that could be used to develop a comprehensive behavior change communication (BCC) strategy on family health in Bihar. The study focuses on increasing the adoption of eight family health behaviors that have a significant bearing on Millennium Development Goals 4 & 5. Funded by the Bill & Melinda Gates Foundation and conducted by experts in the field, it is perhaps for the first time that a BCC study has been designed on such a comprehensive scale.

The earlier two volumes published by Sage Publication (2012) presents similar detailed findings from UP (Volume 1). Volume 2 provides insights from qualitative data on these behaviors collected from Bihar besides in-depth analysis of media including mobile phone, press edits and the media prospective on family health behavior and possibility of their participation in communication strategy.

The present Volume 3 complements Volume 2 on Bihar by providing comprehensive quantitative findings based on a large scale survey covering nine districts representing different social and cultural context of Bihar. It focuses in-depth into the eight key family health behaviors and gives recommendations to enhance their uptakes with special focus on BCC.

Population Council