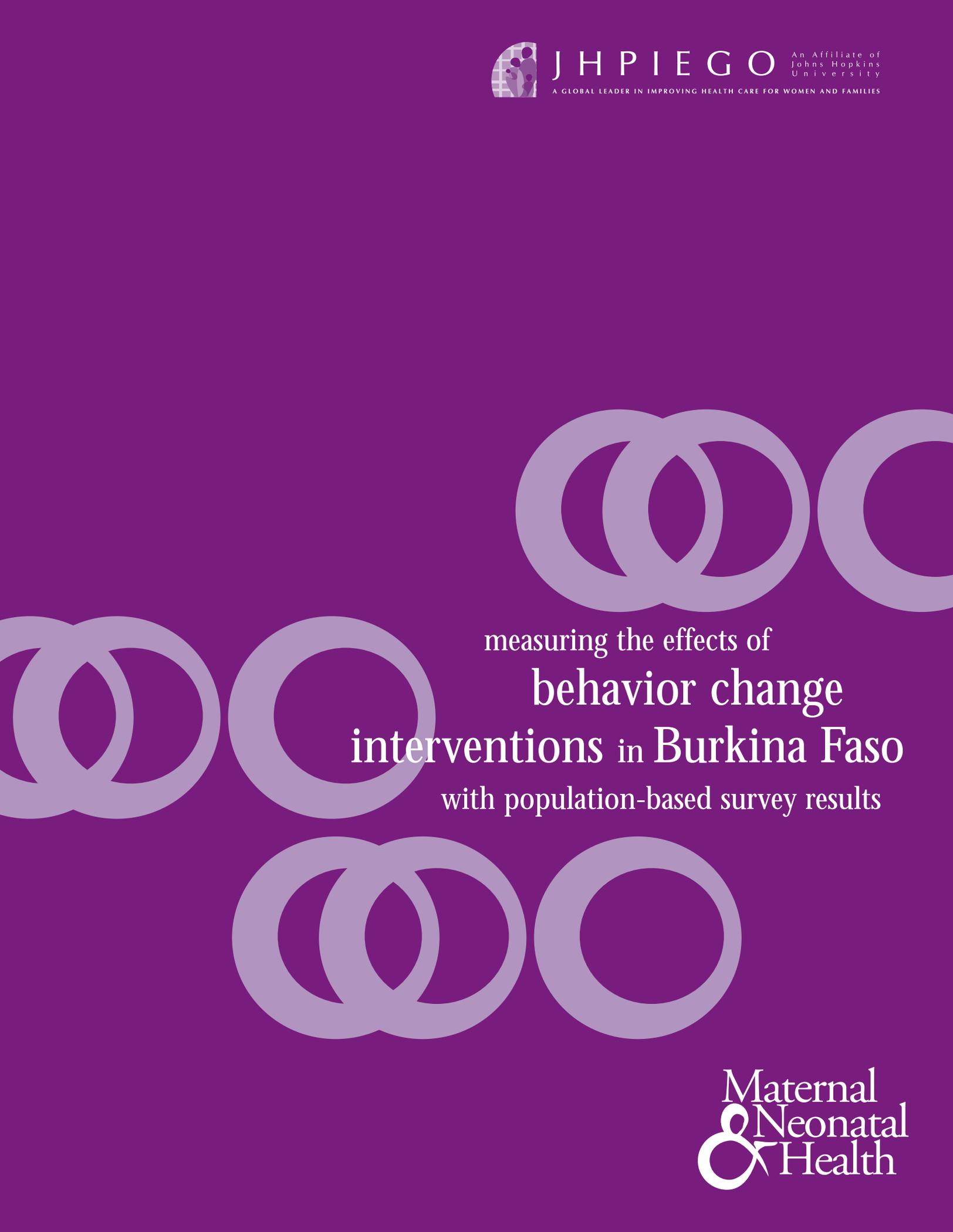




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measuring the effects of  
**behavior change**  
**interventions in Burkina Faso**  
with population-based survey results

Maternal  
& Neonatal  
& Health



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**behavior change**  
**interventions in Burkina Faso**  
with population-based survey results

Banza Baya  
Gabriel Sangli  
Abdoulaye Maiga



The Maternal and Neonatal Health (MNH) Program is committed to saving mothers' and newborns' lives by increasing the timely use of key maternal and neonatal health and nutrition practices. The MNH Program is jointly implemented by JHPIEGO, the Johns Hopkins Center for Communication Programs, the Centre for Development and Population Activities, and the Program for Appropriate Technology in Health.  
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Editor: Sandra Crump

Production Assistance: Youngae Kim

Inquiries should be directed to:

Catherine Elkins, PhD  
Director of Monitoring, Evaluation, and Research  
Maternal and Neonatal Health Program  
JHPIEGO  
1615 Thames Street  
Baltimore MD 21216  
Email: [celkins@jhpiego.net](mailto:celkins@jhpiego.net)

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# ABBREVIATIONS

ANC	Antenatal Care
BP/CR	Birth Preparedness and Complication Readiness
CoGes	Health Center Management Committee
CSPS	Health Center (Centre de le Santé et Promotion Sociale)
DSF	Division of Family and Reproductive Health
IPT	Intermittent Preventive Treatment
ITN	Insecticide-Treated Net
MNH	Maternal and Neonatal Health (Program)
MOH	Ministry of Health
NGO	Nongovernmental Organization
PNPs	Policies, Norms, and Protocols
PSP	Primary Health Post (Poste de Santé Primaire)
SP	Sulfadoxine-pyrimethamine
TBA	Traditional Birth Attendant
UERD	Unité d'Enseignement et de Recherche en Démographie
USAID	United States Agency for International Development
WCA	West and Central Africa
WHO	World Health Organization
WRA	White Ribbon Alliance

# EXECUTIVE SUMMARY

The Maternal and Neonatal Health (MNH) Program began working in Burkina Faso in 1999. The MNH Program partners—JHPIEGO, the Johns Hopkins Center for Communication Programs (JHU/CCP), the Centre for Development and Population Activities (CEDPA), and the Program for Appropriate Technology in Health (PATH)— developed a pilot project in one district, Koupéla, to increase informed demand for and use of skilled providers during pregnancy, childbirth, and the postpartum and newborn periods while increasing the operational capacity of the district health system. These objectives were achieved by working with all levels of the healthcare system in Koupéla, from the national policy level to individual women and their families. The MNH Program in Burkina Faso assisted the Division of Family and Reproductive Health (DSF), a branch of the Ministry of Health, with implementation of its safe motherhood strategy. Initial efforts were focused on using international evidence-based standards to update the national policies, norms, and protocols (PNPs) for reproductive health. The PNPs served as the foundation for all Program clinical interventions, and healthcare providers in 11 health centers and two hospitals are now able to follow standard clinical guidelines for basic and emergency maternal and neonatal healthcare, infection prevention, family planning, and postabortion care.

To generate shared responsibility and coordinated action among policymakers, health facilities, providers, communities, families, and women to support active, sustainable, and informed demand, the MNH Program developed a model process for team building, using the concept of birth preparedness and complication readiness (BP/CR), which is now recognized nationally and is being replicated in other districts. The MNH Program and the Koupéla District Health Management Team built the capacity of existing health center management committees (CoGes) to act as liaisons between health centers and communities in order to strengthen communication systems and develop emergency evacuation and financing plans for the 13 facilities supported by the Program. Local and mass media were used to spread safe motherhood messages to the population. A local theater group wrote a play about BP/CR, which they performed in 80 villages with approximately 10,000 people in attendance. Three local radio stations played safe motherhood messages in coordination with Plan International, a local partner.

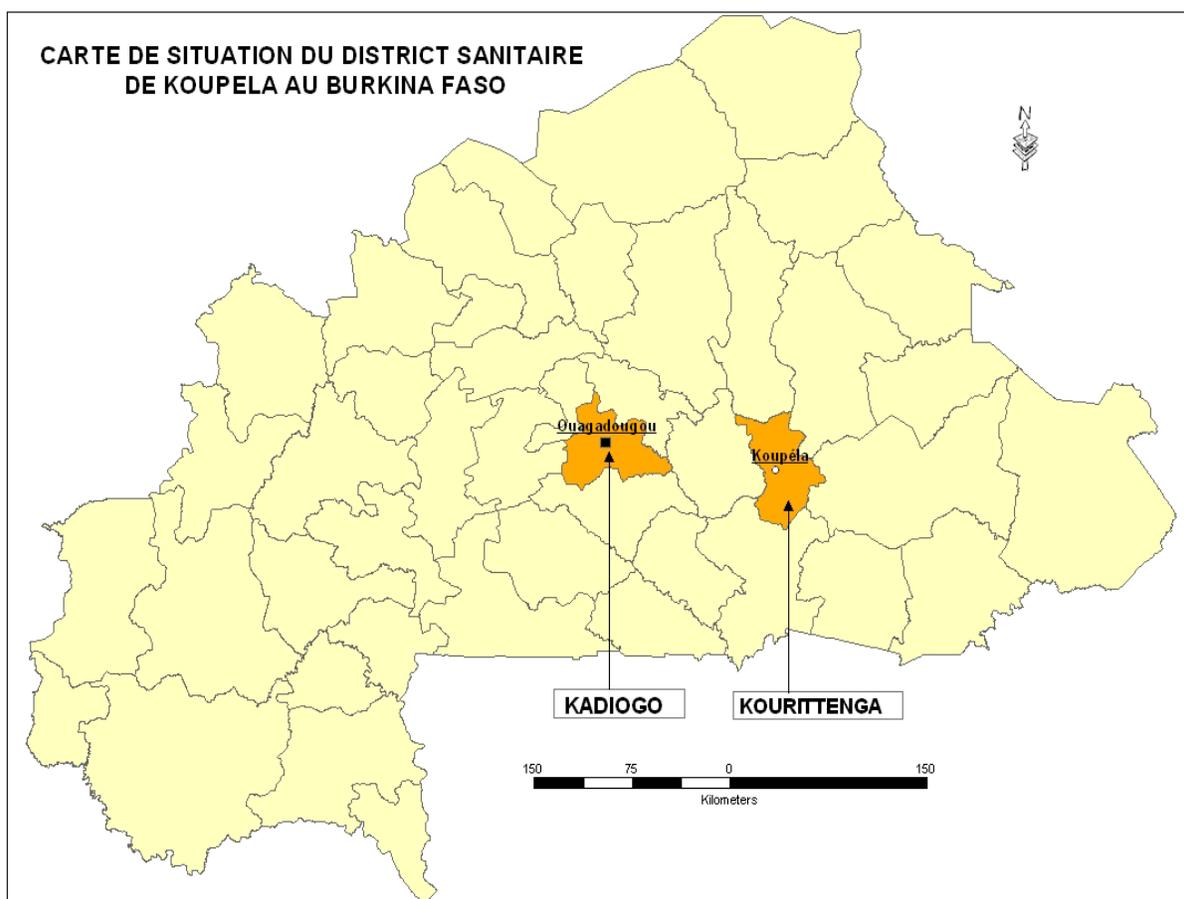
The MNH Program and the Unité d'Enseignement et de Recherche en Démographie [Demographics Teaching and Research Unit] (UERD) of the University of Ouagadougou, Burkina Faso, collaborated on a study of the effects of MNH Program-supported behavior change activities in the Koupéla health district. A baseline survey was conducted in 2001 to ascertain the population's level of knowledge about various maternal and child health concerns, their intentions to act on that knowledge, their health-seeking behavior, and their use of services. Between 2001 and 2004, the MNH Program carried out initiatives in the Koupéla health district aimed at informing the population about appropriate preparation for childbirth and care of the newborn. Program-supported activities focused on skilled attendance at birth, BP/CR, and recognition of danger signs during pregnancy, childbirth, and the postpartum period, and in the newborn. In 2004, a followup survey was conducted to measure changes in levels of knowledge and reported safe motherhood behaviors.

This evaluation report provides detailed information on the specific areas of behavior change targeted by the MNH Program-supported activities, and explains survey results both independently and, where data are comparable, in comparison with baseline results. Among the key findings of the survey is the finding that 69 percent of women surveyed report exposure to MNH Program

messages. In addition, knowledge of postpartum bleeding as a danger sign was higher among women exposed to the MNH Program interventions (62%) than among those not exposed (45%). Most importantly, whereas at baseline only 39 percent of women who had given birth in the previous 12 months reported having a skilled provider at the birth, at followup 58 percent of women who had given birth in the previous 12 months reported doing so with a skilled provider.

A combined indicator or score was constructed from applicable variables, on a scale of 0 to 5. This score encompasses both level of knowledge of danger signs and planning for childbirth by making arrangements for transport and finances and by choosing a skilled provider and healthcare facility for the birth. Whereas only 35 percent of pregnant women's scores were 3 or higher at baseline, 56 percent of pregnant women scored 3 or higher in 2004, suggesting that the Program's activities in Burkina Faso were effective.

## BURKINA FASO, WITH KOUPELA HEALTH DISTRICT



# MEASURING THE EFFECTS OF BEHAVIOR CHANGE INTERVENTIONS IN BURKINA FASO

## INTRODUCTION

The Maternal and Neonatal Health (MNH) Program in Burkina Faso received initial funding through USAID's West Africa Regional Project (WARP) in 1999. The MNH Program developed a pilot project in one district, Koupéla (population 300,000), using and refining approaches and tools there for dissemination later to other districts of Burkina Faso and other countries in the region. The main objectives of the Program were to increase the use of skilled providers during pregnancy, childbirth, and the postpartum and newborn periods and to increase the operational capacity of the district health system. Achieving these objectives involved working with all levels of the healthcare system as it affects Koupéla residents, from the national policy level to individual women and their families. MNH/Burkina Faso first began assisting the Division of Family and Reproductive Health (DSF), a branch of the Ministry of Health (MOH), with implementing its safe motherhood strategy. The first step was updating or creating new national policies, norms, and protocols (PNPs) for reproductive health based on globally accepted, evidence-based standards. These standards served as the foundation for all of the MNH Program's clinical interventions. The PNPs were then introduced to service providers in 11 health centers and two hospitals. The providers are now able to follow standard, evidence-based clinical guidelines for basic and emergency maternal and neonatal healthcare, infection prevention, family planning, and postabortion care.

To foster shared responsibility and collective action among policymakers, health facilities, providers, communities, families, and women through birth preparedness and complication readiness (BP/CR), MNH/Burkina Faso developed a model process for team building that is recognized nationally and is now being replicated in other districts. The Program held quarterly meetings with partners and stakeholders, which resulted in the provision of essential obstetric supplies and equipment for the Program's 13 facilities and the reorganization of the district's referral and medical evacuation system. In addition, these meetings offered a forum for developing the first White Ribbon Alliance (WRA) Secretariat in Burkina Faso to promote safe motherhood.

The MNH Program and the Koupéla District Health Management Team built the capacity of existing health center management committees (CoGes) to act as liaisons between health centers and communities. During the Program, 12 CoGes involved with the Program met 52 times. These CoGes worked with auxiliary midwives, community members, traditional birth attendants (TBAs), and doctors to strengthen communication systems and to develop emergency evacuation and financing plans for the targeted health centers.

MNH/Burkina Faso also used local and mass media to spread safe motherhood messages to the population. A local theater group wrote a play about BP/CR, which they performed in 80 villages in front of approximately 10,000 people. Three local radio stations played safe motherhood messages in coordination with Plan International, a local partner.

Scale-up of best practices also occurred through MNH/Burkina Faso's close work with the U.S. Centers for Disease Control and Prevention and the National Center for Research and Training in Malaria on assessing the disease burden of malaria during pregnancy. After completing a baseline assessment in 2001, these three partners implemented a pilot intervention to introduce intermittent

preventive treatment with sulfadoxine-pyrimethamine (IPT with SP) in Koupéla district. The MNH Program disseminated baseline study results to 18 countries in West and Central Africa (WCA). Those data, coupled with similar data from Mali and Benin, have prompted wide-scale change in policy for reducing the burden of malaria in pregnancy in WCA. Evaluation of the intervention is beginning in 2004.

In agreement with the Government of Burkina Faso's Ministry of Health, the MNH Program (JHPIEGO) and the Unité d'Enseignement et de Recherche en Démographie (Demographics Teaching and Research Unit) (UERD) at the University of Ouagadougou, Burkina Faso, undertook a study on maternal and neonatal health knowledge and practices related to MNH Program interventions among women, men, older women, TBAs, and community leaders in the Koupéla health district.

A baseline survey was conducted in 2001 to ascertain the population's level of knowledge about various maternal and child health concerns and practices.<sup>1</sup> Then, between 2001 and 2004, the MNH Program carried out an initiative in the Koupéla health district aimed at informing the population about the value of skilled attendance at birth and steps to take to prepare for childbirth and possible emergencies. Topics covered included recognition of danger signs during the period from pregnancy through childbirth and the postpartum period, including planning for childbirth; danger signs in the newborn; antenatal care; and postpartum care for mother and child. A followup survey was conducted in 2004.

## **Followup Survey Study Objectives**

### ***General Objective***

The general objective of the study was to compare data from the baseline and followup surveys to learn about the effectiveness of MNH Program-supported safe motherhood activities carried out during the period 2001–2004. This assessment focused on spontaneous knowledge and reported behaviors as a proxy measure for individual and community demand for and access to essential maternal and neonatal health services.

### ***Specific Objectives***

This study followed up on MNH/Burkina Faso's initiative to raise awareness of the situation of pregnant women and children less than 1 year of age and their families in the Program area, and to make the following information available at the local level within the district of Koupéla:

- Reliable data on the population's use of health services during the antenatal, neonatal, and postpartum periods
- Health-related data on children, mothers, and pregnant women
- Reliable indicators for each Program objective in 2001–2003
- A reliable Program evaluation document discussing the effectiveness of its activities

Survey preparation included mapping and sampling; data collection tool design and testing; recruitment, training, and selection of field personnel; implementation in the field; and analysis of the findings. Related documents are presented in **Appendix Tables A-1** through **A-5**.

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<sup>1</sup> Baya B et al. 2002. *Analyse de l'enquête de base: Rapport final*. UERD (Burkina Faso)/MNH Program (USA). 139 pp.

## Data Collection

### Sampling

The sampling frame for the followup survey villages consisted of 145 villages distributed across 12 health areas, the same villages used by MNH/Burkina Faso for the baseline survey. Mapping specialists visited 72 randomly selected villages to identify a sufficient number of eligible respondents who could be easily relocated for interviews. The list of villages used for the mapping phase appears in **Appendix Table A-2**.

The followup survey covered 12 of the 24 health areas of Koupéla health district, with each health area subdivided into strata according to the average distance of the area's villages to the referenced health center. The strata (close or far) designated a group of villages situated less than or greater than the average distance between the health center and the village (**Appendix Table A-2**). Three villages were selected at random in each stratum for the sample. The less rural and more densely populated health areas in Koupéla health district, Pouytenga and Koupéla, were divided into five sectors in order for the populations of each sector to have an equal chance to participate in the sample.

Within each stratum, eligible respondents in the first two villages chosen were given priority. The third village was visited only if the other two villages did not have a sufficient number of eligible respondents. The majority of the eligible respondents surveyed were identified in four or five villages per health area. Surveyors assigned to carry out the qualitative survey worked in the same sample villages, but none of the women who were interviewed for the quantitative survey participated in the qualitative interviews.

Eligible respondents for the quantitative survey fell into one of the following categories: pregnant woman, woman with a child less than 12 months of age, husband of pregnant woman, husband of woman with a child under 12 months of age, older woman<sup>2</sup>, opinion leader, and traditional birth attendant (TBA). Within the last category, two groups were distinguished: *accoucheuse villageoise* and *accoucheuse traditionnelle*. An *accoucheuse villageoise* is a community midwife who has had some sort of formal short-term training from health experts such as doctors, nurses, and registered midwives. The *accoucheuse traditionnelle*, on the other hand, is a community midwife who has had no official training but learned her trade through experience and customary knowledge passed on from elders. The community leaders were eminent persons, leaders of community-based organizations, religious leaders, and so on (**Appendix Tables A-3 and A-4**).

With the help of community health workers, TBAs, some village chiefs, and other local leaders or volunteers, the mapping agents identified the number of eligible respondents needed for the survey, including a sufficient number to be used as replacements, if necessary, in all respondent categories. The same number of people was identified for each health area.

Interviewers were instructed to select eligible pregnant women and women with a child less than 12 months of age from different family compounds in order to ensure a broader representation of various practices and opinions concerning maternal and neonatal health. The older women were selected from households where pregnant women and women with a child under 12 months were interviewed. If none were identified, they were selected from family compounds in which there were

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<sup>2</sup> "Older women" include the mothers-in-law and mothers of the pregnant women and women who had recently given birth, and mothers-in-law or mothers of other pregnant women or women with children who may not have been included in the survey.

pregnant women or women having a child under 12 months of age, even if those women were not interviewed. Husbands were selected based on their presence and availability in these compounds. Only one husband out of every two from the first two categories of women (pregnant women and women with a child aged under 12 months) was interviewed.

In-depth or qualitative interviews were also conducted with 30 mothers of children less than 12 months of age in an attempt to delve more deeply into some important aspects of the survey. For the qualitative survey, two women per health area, divided evenly between strata (near and far) and age (less than 30 years old and 30 years old and older), were selected for the interviews. The results of the qualitative interviews are discussed throughout this report.

TBAs were selected at a rate of three out of five in the most distant stratum, where they were most likely to be working actively. If one of the groups of TBAs was not found in a stratum, respondents were drawn from the second group (closer stratum).

Opinion leaders (influential members of the community) were added as a survey group in the followup survey sample. Although these data have no baseline for comparison, the results are important because opinion leaders are involved in many safe motherhood activities.

### **Data Collection Tools**

The survey used six different coded (quantitative) questionnaires for individual structured interviews, one for each of the following groups:

- Pregnant women
- Women with children less than 12 months of age
- Husbands of pregnant women or women with children less than 12 months of age
- Older women
- TBAs
- Community leaders

In addition, an interview guide was developed for the qualitative interviews conducted with a smaller sample of women with a child less than 12 months of age.

Questionnaires used in the followup survey were based on the baseline questionnaires, but were revised, based on experience gained during data collection in 2001, to elicit more clearly defined responses. MNH Program teams at JHPIEGO and MNH/Burkina Faso collaborated closely to refine all questionnaires. The questionnaires included ten sections:

1. General information
2. Pregnancy and antenatal care
3. Malaria during pregnancy
4. Preparation for and experience during childbirth
5. Postnatal consultations
6. Care of the newborn
7. Quality of services
8. Transmission of HIV from mother to child
9. Personal knowledge about preparation for childbirth
10. Community relations

## Survey Procedure

A total of 24 people participated in interviewer training between 29 January and 10 February 2004 with a team of demographers, specialists in the Mooré language, and MNH/Burkina Faso staff. MNH/Burkina Faso provided technical assistance in the use of specific concepts and language in the questionnaires and with respect to field preparation for the pretest in the Koupéla district. The villages of Koughin and Paspanga were selected for the pretest, which was conducted on 8 February. All questionnaires were pretested, including the in-depth qualitative survey, and changes and clarifications based on the pretest results were incorporated into the forms during the last 2 days of training.

All participants in the training had prior experience in data collection, and all of the trained individuals were subsequently hired as field interviewers. Several had been involved in the baseline survey. Two individuals were designated, based on their experience, to conduct the in-depth interviews, with the rest responsible for the quantitative interviews. Six of the field personnel—one field supervisor, one quality controller, and four interviewers—were women.

Two general field supervisors oversaw the 16 surveyors and four quality controllers for the quantitative survey and the two surveyors for the qualitative survey. The field supervisors were individuals who had distinguished themselves in the field during the baseline survey.

Mapping took place from 7 to 16 February 2004 in order to locate the people to be interviewed and to reduce logistical difficulties when implementing the survey. This process had also been followed for the baseline. Some villages had incorrect strata identified according to information collected during the baseline, which was discovered during fieldwork. In such cases, incorrectly classified villages were replaced with correctly classified ones in that stratum within the same health area.

Fieldwork started on 12 February 2004 and concluded on 25 March 2004. Each of the two supervision teams was composed of two quality control teams and four surveyors. Each supervision team was responsible for covering six health areas with a total of 360 respondents in the various respondent categories.

In all, field personnel visited 51 villages out of the sample pool of 72 identified from the survey sample frame of 145. The 720 respondents were distributed across the target groups as follows:

- 180 pregnant women
- 180 women with a child less than 12 months of age
- 180 husbands (two groups of 90 husbands of the women in each of the preceding two groups)
- 60 older women
- 60 TBAs (*accoucheuses villageoises* and *accoucheuses traditionnelles*)
- 60 opinion leaders

Univariate analyses were conducted for sociodemographic variables. Bivariate analyses were conducted for the remaining variables for all groups (women, men, older women, TBAs, and community leaders). *Stata* was used to perform a two-sample test of proportion, producing a z-test of significance. Independent variables tested include exposure status (unexposed vs. exposed) and survey (baseline vs. followup). For those significant analyses in which one of the cells in the 2-by-2 table was less than 5, p-values were not reported. Answers to open-ended questions were coded manually and then entered and analyzed using *SPSS* software.

In-depth interviews were conducted in Mooré (local language of Koupéla district in Burkina Faso) and audio recorded. All interviews were translated into French by transcribers and then entered into Microsoft Word in English. *nVivo* software was used to code and organize the data.

### ***Limitations of the Study***

One challenge in the data collection was that respondents could not always distinguish the multiplicity of new concepts and desired practices. For instance, women surveyed were not always able to distinguish between the registered TBAs, nurses, or auxiliary midwives who may staff health facilities. In addition, respondents sometimes confused antenatal/postnatal visits with healthcare visits for other reasons. Respondent numbers were insufficient for meaningful interpretation of some data. For example, only a small number of women had children between 6 and 12 months, so there was only a small sample to report on exclusive breastfeeding to the age of 6 months.

The small sample size of three of the surveyed groups—older women, TBAs, and community leaders—meant that statistical analyses between exposed and unexposed persons within these groups could rarely be conducted. Even statistical comparisons between baseline and followup were often not possible for older women and TBAs.

No baseline-to-followup comparison is possible for community leaders, because this category was added in the followup survey sample. Other data collected during the followup survey also do not have comparable data in the baseline survey. For example, followup questionnaires for pregnant women, women who had given birth in the previous 12 months, and husbands were modified from those used for the earlier survey, in order to elicit clearer and more focused information from the respondents. This improvement in the instrument sometimes meant that data from modified questions could not be compared to baseline data.

## **Sociodemographic Characteristics and Exposure**

### ***Sociodemographic Characteristics***

The baseline and followup survey populations were structured comparably. At followup, women of childbearing age (pregnant women and women having a child under 12 months of age) were the youngest (mean age of 28.6 years) and most homogeneous group (standard deviation = 7 years). This was also true at baseline. The relative youth of this group is partly explained by the fact that wives typically are younger than their husbands (**Table 1**).

**Table 1. Sociodemographic Characteristics of Women and Husbands in Surveys**

Characteristic		Women (N=360)		Husbands (N=180)	
		Baseline	Followup	Baseline	Followup
Mean age		28.6 years	27.9 years	39.1 years	38.7 years
Married*		99.8%	100%	99.5%	100%
Never attended school		87.2%	87.2%	76.1%	76.75
Mossi ethnicity		90.6%	87.8%	91.7%	87.2%
Rural Residence		94.2%	95.6%	93.9%	96.1%
Religion	Muslim	46.4%	47.8%	45%	43.3%
	Catholic	52.8%	47.8%	52.2%	53.3%
Personal ownership of a mode of transport	None	80.8%	78.9%	5.6%	2.8%
	Bicycle	14.4%	21.1%	91.7%	94.4%

NOTE: Women=pregnant women and women who had given birth in previous 12 months.

\* Monogamous and polygamous marriages

Community leaders were mostly men and on average were older than the husbands of the women studied (**Table 2**). This age gap is partly explained by the fact that men attain positions of responsibility in the community only after they have a certain amount of life experience and have attained a certain credibility, with marriage being an initial but strong symbol in that regard.

**Table 2. Sociodemographic Characteristics of Community Leaders (N=60)**

Characteristic		Baseline	Followup
Mean age		NA	49.8 years
Married*		NA	95%
Never attended school		NA	75%
Mossi ethnicity		NA	95%
Rural Residence		NA	95%
Religion	Muslim	NA	36.7%
	Catholic	NA	61.7%

\* Monogamous and polygamous marriages

The average age of older women and the average age of TBAs are comparable between the baseline and followup surveys (**Table 3**). In addition, TBAs had the widest range of ages: 22 years to 99 years.

**Table 3. Sociodemographic Characteristics of Older Women and TBAs**

Characteristic		Older Women (N=60)		TBAs (N=60)	
		Baseline	Followup	Baseline	Followup
Mean age		63.3 years	62.4 years	55.3 years	56 years
Married*		60.0%	51.7%	60.0%	61.6%
Never attended school		93.3%	93.3%	83.3%	90.0%
Mossi ethnicity		95.0%	85.0%	93.3%	91.7%
Rural Residence		93.3%	96.7%	100%	96.7%
Religion	Muslim	33.3%	36.7%	36.7%	36.7%
	Catholic	63.3%	61.7%	60.0%	60.0%

\* Monogamous and polygamous marriages

The marital status patterns of the respondents were similar both between the two data collection periods and across the different groups. Women of childbearing age were all married and living in either monogamous (66%) or polygamous (34%) relationships. Virtually the same proportions of monogamy and polygamy were found among their husbands. Widowhood is the next most frequent marital status, found primarily among older women and TBAs. Divorce is rare and typically results in severe social stigmatization in the community. The sample yielded no divorced respondents.

Koupéla district is predominantly rural, and rural respondents dominate the study population. Only the towns of Koupéla and Pouytenga are semi-urban. These two towns were included in the sample without being overrepresented within the overall context of the survey.

Since the environment of the Koupéla district is mainly rural, the level of educational attainment was low among respondents to both the baseline and the followup survey. A majority of the population had never attended school, and a greater proportion of the women than the men reported never attending school. Those who had gone to school rarely got beyond the primary level. The followup survey revealed slightly higher secondary school attendance.

As for the ethnic composition of the population, the dominant group is the Mossi (who make up 85–95% of the survey), followed by the Peulh and then the Yarga. These proportions were the same in both surveys. This composition is not surprising as the region of Koupéla is part of the traditional Mossi bastion where the Mossi Kingdom originated in the eleventh century.

The dominant religions in the region of Koupéla reflect the religious makeup of the country as a whole. In the pilot area, however, the largest religious group is Catholic, followed by Muslim, whereas the national pattern is the opposite. This pattern reflects the local history of Koupéla, where the Missionary Society of Africa opened the first Catholic school in Burkina Faso in 1900 and has been active ever since.

As a means of assessing preparation for childbirth, the survey included questions about the availability of a personal means of transportation. Most of the population is very poorly equipped, but 91 percent of men reported having a means of transportation. In 2001, 5.6 percent of the men interviewed did not have any personal means of transportation, and in 2004 only 2.8 percent gave this response. The primary means of transportation among all respondents was the bicycle.

Farming and animal husbandry are clearly the dominant occupational activities (reported by between 75% and 93.3% of respondents). Most of the other respondents who work are engaged in commerce. Income sources follow these occupational patterns, with trade in local products accounting for a large share of income. Agricultural and livestock products serve as a source of savings for the population and constitute a financial reserve in case of need.

### **Exposure to the MNH Program**

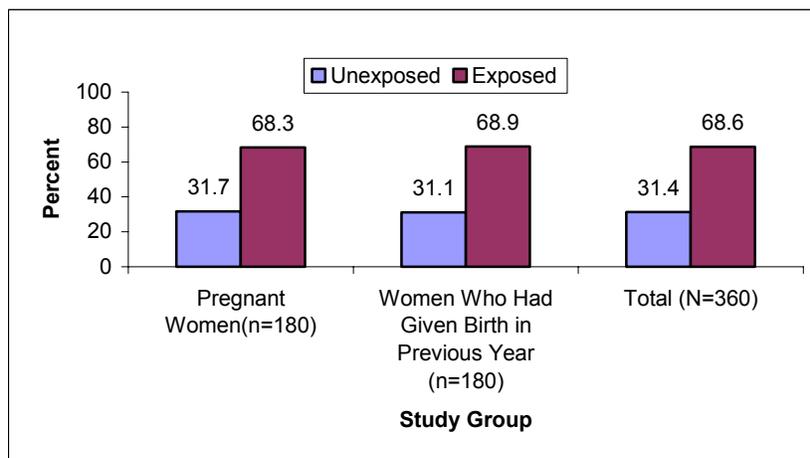
In order to assess the effects of the MNH Program on knowledge, perceptions, and behaviors in the Koupéla health district, the survey divided respondents into two categories—exposed and unexposed—based on exposure to MNH Program activities between 2001 and 2004.

Women of childbearing age, TBAs, older women, and men were included in the exposed category if they reported having heard the term “preparation for childbirth” through at least one MNH Program source (provider, mobilization agent, village theater, White Ribbon Alliance, flipchart, radio).

Community leaders were included in the exposed category if they reported having “knowledge of projects in the area of safe motherhood and child health” through at least one MNH Program source (as above). These definitions leave open the possibility that some of the unexposed respondents might have known about MNH Program safe motherhood activities and messages—for instance, indirectly through family or friends.

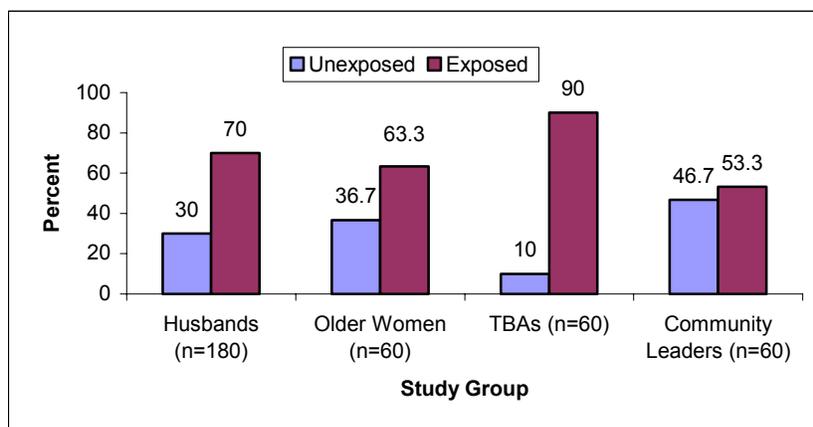
The unexposed group in each category of respondents was generally small. More specifically, almost 70 percent of women of childbearing age had been exposed to MNH Program interventions between 2001 and 2004 (**Figure 1**). The proportions of exposure are about the same for the husbands of women of childbearing age (**Figures 1 and 2**).

**Figure 1. Percentage of Women Exposed to the MNH Program**



Among TBAs, however, the proportions are significantly higher. Indeed, 90 percent of TBAs were exposed to MNH Program interventions (**Figure 2**). This finding supports program data suggesting that TBAs were very involved in Program activities.

**Figure 2. Percentage of Other Groups Exposed to the MNH Program**



On the whole, older women and community leaders were the groups with the least exposure to the Program’s interventions, 63.3 percent of older women and 53.3 percent of community leaders reporting that they had been exposed to activities related to preparation for childbirth. These are still high levels of exposure.

Sources of information about preparation for childbirth partly explain the differences in exposure among the groups. In general, healthcare providers were the main source of information. More than 75 percent of the men, older women, and opinion leaders cited their healthcare provider as their source of information (Table 4). Among the women of childbearing age and the TBAs, 90 percent had heard the term “preparation for childbirth” from a healthcare provider. The frequency of this response among the TBAs (94.4%) suggests that there is strong interaction among maternal and neonatal health workers.

**Table 4. Distribution of Respondents by Source of Information on Preparation for Childbirth**

Source of Information	Respondent Category									
	Women (n=256)		Men (n=137)		Older Women (n=38)		TBAs (n=54)		Community Leaders (n=60)	
	n	%	n	%	n	%	n	%	n	%
Healthcare Provider	221	86.3	106	77.4	29	76.3	51	94.4	45	75.0
Family member	19	7.4	6	4.4	5	13.2	0	0.0	8	13.3
Friend	8	3.1	6	4.4	0	0.0	3	5.6	2	3.3
Flipchart	12	4.7	15	10.9	3	7.9	7	13.0	0	0.0
Village theater	24	9.4	27	19.7	8	21.1	8	14.8	5	8.3
White Ribbon Alliance	3	1.2	4	2.9	0	0.0	1	1.9	1	1.7
Radio	70	27.3	63	46.0	9	23.7	16	29.6	12	20.0
Social mobilization agent	69	27.0	61	44.5	17	44.7	18	33.3	23	38.3

Social mobilization agents were the second leading source of information for the older women (44.7%), TBAs (33.3%), and community leaders (38.3%). For women of childbearing age (27.3%) and their husbands (46%), on the other hand, the radio was the second source of information.

The White Ribbon Alliance (WRA) is not yet widely known in the community, and was cited least often as a source of information on preparation for childbirth. None of the older women had learned of preparation for childbirth from the WRA. Among women of reproductive age, husbands, TBAs, and community leaders, between 1.2 percent and 2.9 percent had heard about preparation for childbirth through the activities of the WRA.

## **KNOWLEDGE OF DANGER SIGNS, CARE FOR NEWBORNS, AND PLANNING IN THE COMMUNITY**

Knowledge of danger signs during pregnancy, childbirth, and the postpartum period, and in the newborn is crucial for safe motherhood. Women and families are more likely to seek care in the event of an emergency if they are aware of symptoms of obstetric or neonatal complications. Knowledge of how to care for a newborn is an indication of the capacity for managing the newborn's health.

This section focuses on respondents' spontaneous knowledge of danger signs, of how to care for a newborn, and of services and plans for maternal and neonatal health in the community. Responses concerning the existence of community services make it possible to assess the existence of maternal and neonatal health plans in the village and to estimate the level of knowledge of these plans among the various categories of respondents.

### **Knowledge of Danger Signs**

#### ***Knowledge of Danger Signs during Pregnancy***

In both the baseline and followup surveys, women of childbearing age and their spouses mentioned the following danger signs most often, in descending order of frequency: bleeding during pregnancy, dizziness, increased/decreased fetal movement, and swelling of the face/hands. Other categories of respondents mentioned increased or decreased fetal movement more often than dizziness during pregnancy. Among all respondents, visual disturbances/seizure was cited least often (**Tables 5 and 6**).

Between the baseline survey in 2001 and the followup in 2004, knowledge of danger signs generally increased among women who were pregnant or had recently given birth at the time of the survey. The exceptions were knowledge of increased or decreased fetal movement and knowledge of dizziness. Women who had been exposed to MNH Program interventions had greater knowledge of the danger signs during pregnancy than did their counterparts who had not been exposed.

In both the baseline and followup surveys, approximately two out of five women mentioned bleeding during pregnancy as a danger sign. The proportions were virtually the same among exposed and unexposed women.

**Table 5. Women’s Knowledge of Danger Signs during Pregnancy, by Survey**

Danger Sign during Pregnancy	Pregnant Women and Women with Recent Birth							
	Baseline (N=360)		Followup					
	n	%	Exposed (n=247)		Unexposed (n=113)		Total (N=360)	
			n	%	n	%	n	%
Bleeding during pregnancy	142	39.4	104	42.1	46	40.7	150	41.7
Severe headaches	64	17.8	75	30.4	19	16.8	94	26.1
Visual disturbances/seizure	15	4.2	23	9.3	8	7.1	31	8.6
Increased/decreased fetal movement	85	23.6	54	21.9	24	21.2	78	21.7
Swelling of face/hands	27	7.5	43	17.4	13	11.5	56	15.6
Dizziness	126	35.0	77	31.2	34	30.1	111	30.8
Fever	70	19.4	105	42.5	25	22.1	130	36.1
Don’t know	44	12.2	11	4.5	17	15.0	28	7.8

Twice the percentage of women mentioned visual disturbances/seizure or swelling of face/hands during the followup survey as during the baseline: At baseline, 4.2 percent of women mentioned visual disturbances/seizure and 7.5 percent mentioned swelling of face/hands; at followup, these percentages had increased to 8.6 percent and 15.6 percent. Exposed women recognized these two symptoms more often than those who had not been exposed. Knowledge of increased/decreased fetal movement decreased from baseline to followup (from 23.6% to 21.7%), and the same was true for knowledge of dizziness (decreased from 35% to 30.8%). Knowledge of these two danger signs is about the same regardless of women’s exposure to the MNH Program.

Proportions of husbands reporting knowledge of the various danger signs during pregnancy are about the same as among the women, with higher knowledge of all danger signs at followup (**Table 6**). Exposed men exhibited greater knowledge of the danger signs than those who had not been exposed. This finding, although not statistically significant, suggests that MNH Program messages on danger signs during pregnancy reached the intended audience.

Older women’s knowledge of danger signs during pregnancy also increased from baseline to followup. In addition, the older women who had been exposed to the MNH Program showed greater knowledge of all of the danger signs during pregnancy except bleeding, which was recognized by approximately equal proportions of exposed and unexposed women.

TBAs’ knowledge of most danger signs during pregnancy increased between baseline and followup, but decreases were found in some categories between baseline and followup and exposure. Because the unexposed group was small, it was not possible to accurately determine statistical significance. For all the danger signs during pregnancy, community leaders who had been exposed to the MNH Program’s interventions had greater knowledge than those who had not.

**Table 6. Husbands' Knowledge of Danger Signs during Pregnancy, by Survey**

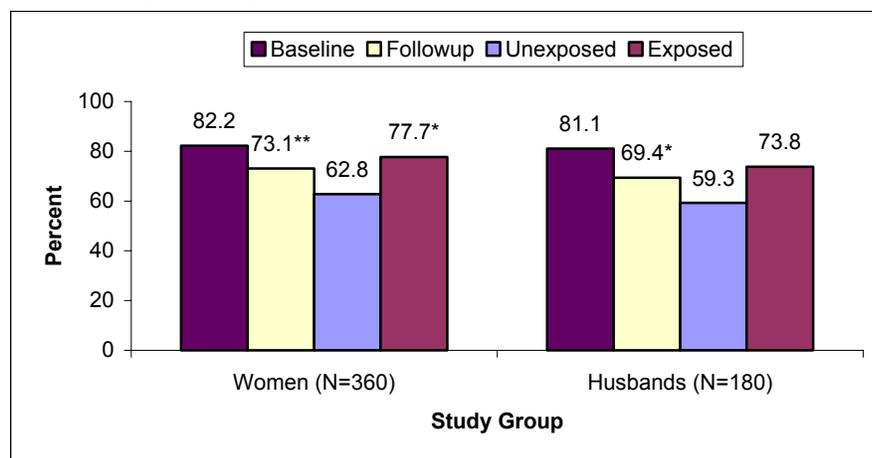
Danger Sign during Pregnancy	Husbands of Pregnant Women and Women with a Recent Birth							
	Baseline (N=180)		Followup					
	n	%	Exposed (n=126)		Unexposed (n=54)		Total (N=180)	
			n	%	n	%	n	%
Bleeding during pregnancy	50	27.8	49	38.9	15	27.8	64	35.6
Severe headaches	36	20.0	36	28.6	14	25.9	50	27.8
Visual disturbances/seizure	8	4.4	20	15.9	7	13.0	27	15.0
Increased/decreased fetal movement	32	17.8	30	23.8	11	20.4	41	22.8
Swelling of face/hands	14	7.8	20	15.9	5	9.3	25	13.9
Dizziness	60	33.3	49	38.9	12	22.2	61	33.9
Fever	44	24.4	46	36.5	15	27.8	61	33.9
Don't know	20	11.1	4	3.2	5	9.3	9	5.0

### Knowledge of Danger Signs during Childbirth

Among women of childbearing age, the danger signs cited most frequently during the baseline and followup studies were, in descending order, prolonged labor, abdominal pain, and fetal malpresentation.

Overall, there was a rise in the level of knowledge of danger signs among women of childbearing age and their husbands between baseline and followup, except in the case of prolonged labor. As shown in **Figure 3**, the proportion of women and men who mentioned prolonged labor decreased from baseline (82.2% of women; 81.1% of men) to followup (73.1% of women; 69.4% of men). Although there was an unexpected decrease in the percentage of women and husbands who recognized this danger sign at followup, significantly ( $p < .05$ ) more exposed women had knowledge of prolonged labor as a danger sign, indicating that MNH Program messages reached the women.

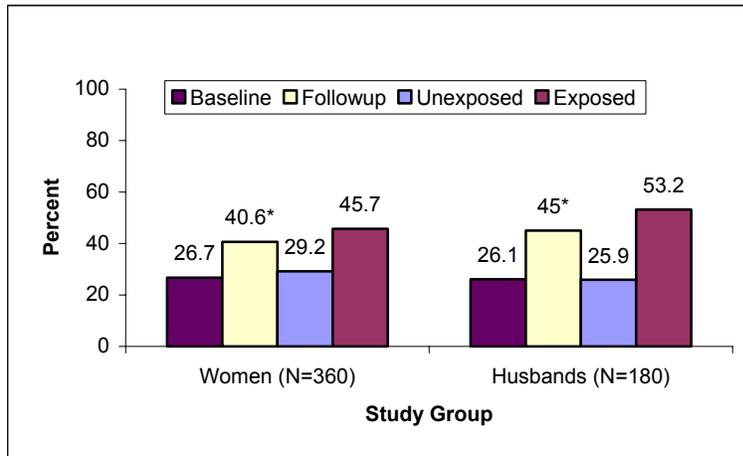
**Figure 3. Proportion of Women and Husbands with Knowledge of Prolonged Labor as a Danger Sign during Childbirth, by Survey and Exposure**



\* $p < .05$ ; \*\* $p < .01$

As shown in **Figure 4**, significantly ( $p<.05$ ) more women and their husbands at followup had knowledge of severe abdominal pain as a danger sign during childbirth. Women’s knowledge increased from 26.7 percent at baseline to 40.6 percent at followup, and men’s knowledge increased from 26.1 percent at baseline to 45 percent at followup. Furthermore, exposed women and men had a higher level of knowledge of this danger sign than did their unexposed counterparts.

**Figure 4. Proportion of Women and Husbands with Knowledge of Abdominal Pain as a Danger Sign during Childbirth, by Survey and Exposure**



\* $p<.05$

For all of the indicators evaluated, there was a trend toward increased knowledge of danger signs among the older women. However, the changes in the proportions between the two studies were fairly small. Among older women interviewed during the followup survey, exposed women had greater knowledge of danger signs during childbirth than did the unexposed group.

Among the TBAs, the pattern was nearly the same as that of older women. With the exception of prolonged labor, the various danger signs during childbirth were more frequently identified by TBAs who had been exposed to the MNH Program. No unexposed TBA mentioned premature rupture of the membranes as a danger sign during childbirth.

As with the other groups studied, knowledge of danger signs differed among the community leaders, depending on whether they had been exposed to the MNH Program. Generally speaking, the frequency of responses relative to danger signs was higher among leaders who had been exposed to the Program.

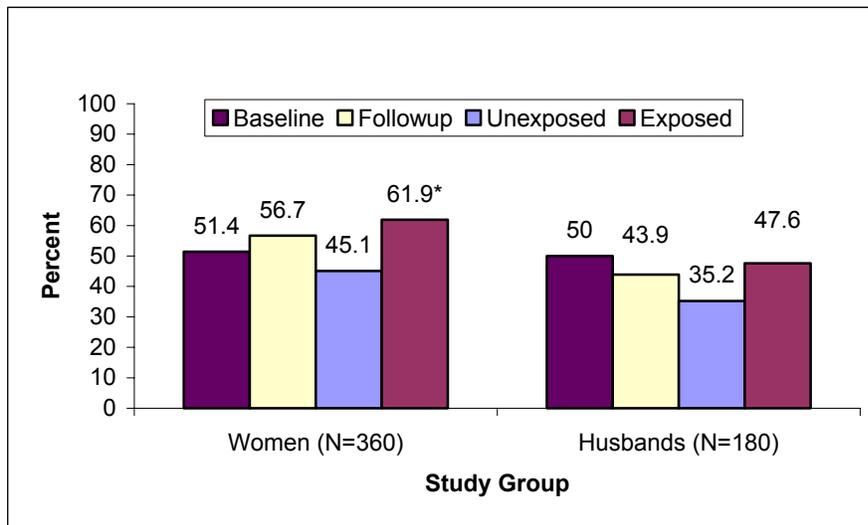
### **Knowledge of Danger Signs during the Postpartum Period**

Danger signs important to identify during the postpartum period include severe bleeding immediately following childbirth (postpartum hemorrhage), loss of consciousness after childbirth, and fever. All categories of respondents in the baseline survey identified severe bleeding and loss of consciousness in the postpartum period most frequently. In the followup survey, severe bleeding and fever were identified most frequently.

Among women of childbearing age, knowledge of postpartum danger signs at followup increased between baseline and followup. For example, as shown in **Figure 5**, women’s knowledge of severe bleeding as a danger sign during the postpartum period increased between baseline and followup.

Additionally, significantly more ( $p < .05$ ) exposed women (61.9%) knew that severe bleeding was a postpartum danger sign, whereas less than half (45.1%) of the unexposed women had this knowledge.

**Figure 5. Proportion of Women and Husbands with Knowledge of Severe Bleeding as a Danger Sign during the Postpartum Period, by Survey and Exposure**



\* $p < .05$

At followup, husbands of women of childbearing age reported a slightly lower level of knowledge of severe bleeding (43.9%) than at baseline (50%). Despite this slight decrease, a comparison of the exposed (47.6%) and unexposed (35.2%) respondents in this group reveals greater knowledge of severe bleeding as a danger sign in the exposed group.

Knowledge of danger signs among the older women showed a mixed pattern of change between baseline and followup. Older women who had been exposed to the Program reported higher levels of knowledge of danger signs (**Appendix Table A-6**).

Overall knowledge of danger signs increased among the TBAs. The one exception was that the proportion of TBAs who identified loss of consciousness as a danger sign decreased by 15 percent between the baseline and followup studies (**Appendix Table A-6**). Like the other groups of exposed respondents, exposed TBAs showed better knowledge of danger signs than their unexposed counterparts.

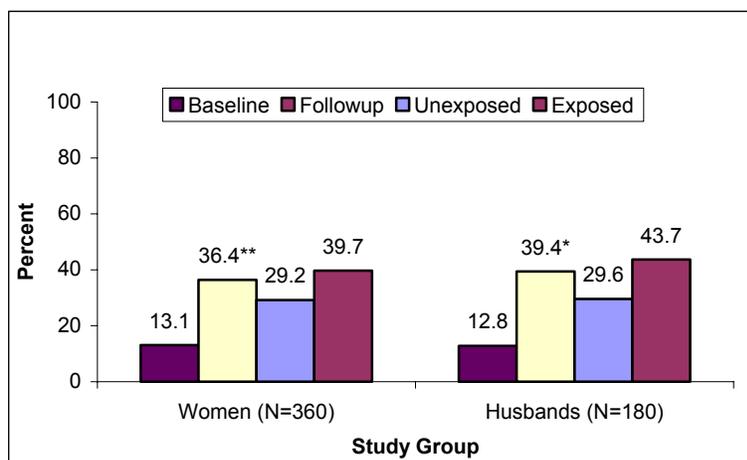
Among community leaders, the differences between baseline and followup are less pronounced. There were notable differences in knowledge levels between leaders who had been exposed to the MNH Program and those who had not in the case of two danger signs: severe bleeding (65.6% of the exposed respondents versus 42.9% of unexposed respondents) and fever (28.1% versus 10.7%) (**Appendix Table A-7**).

### **Knowledge of Danger Signs during the Neonatal Period**

Over the life of the MNH Program, knowledge of feeding difficulties in the newborn increased significantly ( $p < .05$ ) among women of childbearing age (from 13.1% at baseline to 36.4% at followup) and their husbands (12.8% at baseline to 39.4% at followup). In addition, respondents exposed to the Program were more likely than those who were not exposed to identify feeding

difficulties (Figure 6). Knowledge of this danger sign is particularly important, because feeding difficulties are among the first signs of infection in the newborn.

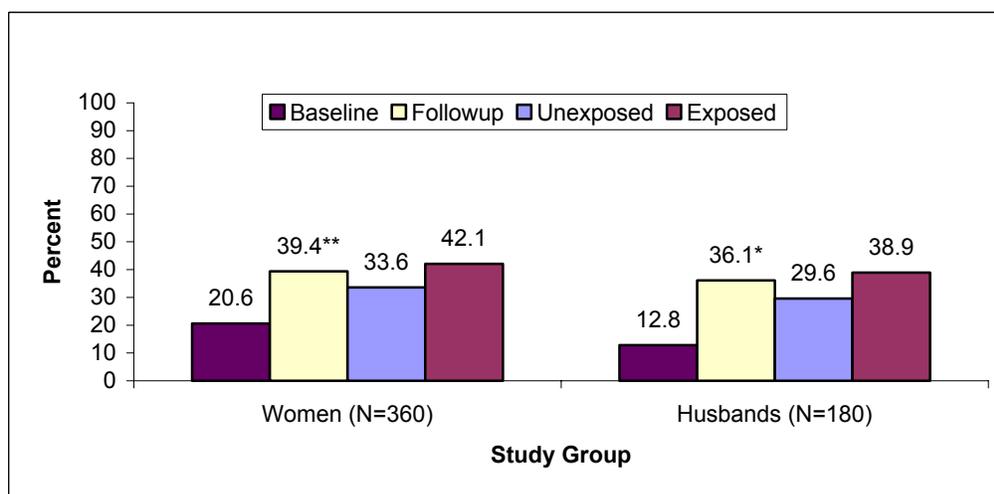
**Figure 6. Proportion of Women and Husbands with Knowledge of Feeding Difficulty as a Danger Sign in the Newborn, by Survey and Exposure**



\* $p < .05$ ; \*\* $p < .01$

Fever in the newborn is another important danger sign. Women of childbearing age and their husbands showed significantly higher levels of knowledge ( $p < .05$ ) of this specific danger sign at followup than at baseline. There was about a two-fold increase in knowledge of fever among both women and men (from 20.6% to 39.4% among women and from 12.8% to 39.4% among men). Knowledge was higher among women and men exposed to MNH Program interventions than among the unexposed respondents (Figure 7).

**Figure 7. Proportion of Women and Husbands with Knowledge of Fever as a Danger Sign in the Newborn, by Survey and Exposure**



\* $p < .05$ ; \*\* $p < .01$

The danger signs mentioned most by older women at followup were feeding difficulties (48.3%) and fever (36.7%). Older women's knowledge of all of the newborn danger signs except respiratory difficulties increased from baseline to followup. The older women exposed to the MNH Program interventions were more aware of the danger signs.

During the followup survey, the newborn danger sign cited most frequently by TBAs was respiratory difficulties. On the whole, knowledge grew substantially in this group between the two periods. The TBAs who had been exposed to MNH Program interventions were better informed about danger signs than their unexposed counterparts. However, the number of exposed TBAs was too small to permit a valid differential analysis.

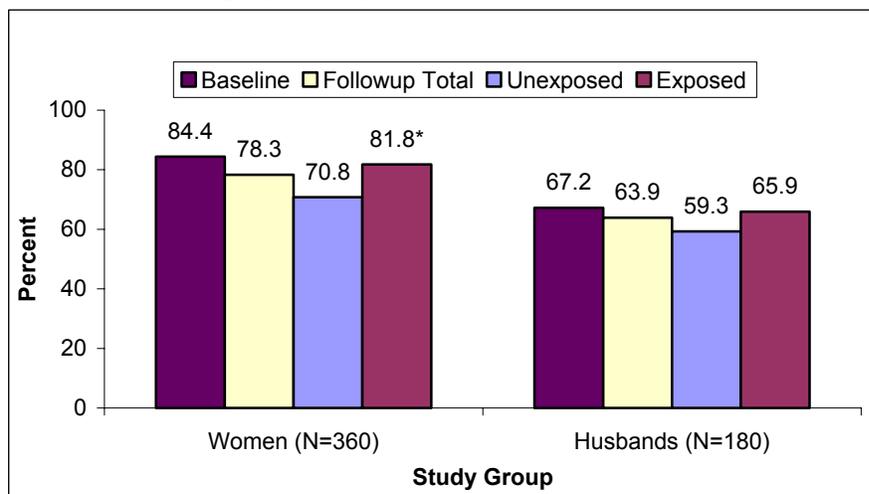
A notable difference in knowledge was found among community leaders depending on whether or not they had been exposed to the MNH Program. Exposed leaders exhibited greater knowledge of the danger signs in the newborn.

### Knowledge of Newborn Care

Overall, knowledge of basic newborn care was greater at the time of the followup survey than at baseline. The proportion of respondents having no knowledge of basic newborn care decreased. Moreover, exposed respondents had more knowledge of basic newborn care than unexposed respondents (**Appendix Table A-8**). (Community leaders were not questioned about basic newborn care.)

Knowledge of cleaning and wrapping the newborn was the most improved aspect of knowledge of basic newborn care among women of childbearing age and their husbands. As shown in **Figure 8**, 81.8 percent of the exposed women of childbearing age, compared to 70.8 percent of their unexposed counterparts, had knowledge of cleaning and wrapping, which is evidence that the MNH Program improved women’s knowledge. Husbands of women of childbearing age showed a similar pattern in their knowledge of cleaning and wrapping a newborn.

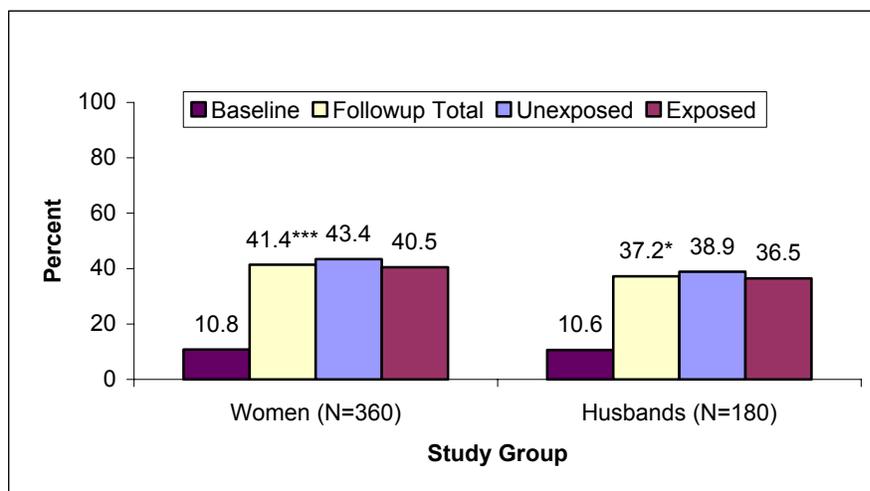
**Figure 8. Proportion of Women and Husbands with Knowledge of Newborn Cleaning and Wrapping, by Survey and Exposure**



\* $p < .05$

Knowledge of exclusive breastfeeding among women of childbearing age and their husbands improved greatly over the life the MNH Program (**Figure 9**). Knowledge increased from 10.8 percent to 41.4 percent ( $p < .001$ ) among women of childbearing age and from 10.6 percent to 37.2 percent ( $p < .05$ ) among their husbands.

**Figure 9. Proportion of Women and Husbands with Knowledge of Exclusive Breastfeeding, by Survey and Exposure**



\* $p < .05$ ; \*\*\* $p < .001$

Older women's understanding of exclusive breastfeeding as a basic care measure increased, and the proportion of older women who mentioned it at followup more than doubled. More than 40 percent of older women who had been exposed to the MNH Program knew about exclusive breastfeeding (**Appendix Table A-8**).

Among TBAs, awareness of exclusive breastfeeding as an element of basic newborn care increased from 15 percent at baseline to 40 percent at followup, while the proportion who mentioned cleaning/wrapping of the newborn was the same (95%) before and after the intervention. Both exposed and unexposed TBAs exhibited considerable knowledge of newborn care. However, because the number of unexposed TBAs was small, we cannot draw conclusions about this result.

### Knowledge of the Existence of Community Services

Respondents were asked if they knew of any health services or plans in the community aimed at promoting safe motherhood. The services considered were transportation systems for obstetric emergencies and patient evacuations, and financial loans or grants for emergencies. The third service was a blood bank for mothers in need of a blood transfusion.

A sizeable segment of the population (75–80%) said that such plans did not exist in their community. The proportion of respondents who said they had no knowledge of such services was lower at followup than baseline and lower among exposed respondents than among those not exposed.

A little less than half (43.6%) of the women who were pregnant or had recently given birth at baseline were aware of the existence of a transportation plan (**Table 7**). The percentage of women reporting knowledge of this service dropped to 3.9 percent in 2004. As for knowledge of a financing plan, the level of knowledge rose from 0.3 percent at baseline to 6.7 percent at followup. Knowledge of the existence of a blood donor system, which was very low in 2001 (0.3%), showed virtually no change in 2004 (1.9%). The proportion of respondents who maintained that such services did not exist doubled between baseline (42.2%) and followup (80.3%).

The small proportions noted may not reflect the populations' real level of knowledge. Interviewers worded questions slightly different during the followup survey than during the baseline, which may have led to respondents' misunderstanding of the question itself.

**Table 7. Women's Knowledge of Health Services in the Community, by Survey**

Type of Service	Pregnant Women and Women with a Recent Birth							
	Baseline (N=360)		Followup					
	n	%	Exposed (n=247)		Unexposed (n=113)		Total (N=360)	
			n	%	n	%	n	%
Transport	157	43.6	10	4.0	4	3.5	14	3.9**
Financial	1	0.3	22	8.9	2	1.8	24	6.7
Blood	1	0.3	6	2.4	1	0.9	7	1.9
None	152	42.2	193	78.1	96	85.0	289	80.3***
Don't know	40	11.1	15	6.1	11	9.7	26	7.2

\*\*p<.01; \*\*\*p<.001

Although the differences between women who had and had not been exposed to the MNH Program were not large, women who had been exposed had greater knowledge of these services.

The level of knowledge of health services in the community was little better among the husbands of the women of childbearing age. Fewer than 2 percent of the men interviewed at baseline reported the existence of such services (**Table 8**), and close to 90 percent said that they did not exist. At baseline, 80 percent of the men interviewed continued to say that such services did not exist.

No meaningful conclusions can be drawn on the effects of MNH Program exposure on men because the proportions of men who knew about these services were small and virtually the same regardless of exposure.

**Table 8. Husbands' Knowledge of Health Services in the Community, by Survey**

Type of Service	Husbands of Pregnant Women and Women with a Recent Birth							
	Baseline (N=180)		Followup					
	n	%	Exposed (n=126)		Unexposed (n=54)		Total (N=180)	
			n	%	n	%	n	%
Transport	2	1.1	6	4.8	3	5.6	9	5.0
Financial	1	0.6	11	8.7	4	7.4	15	8.3
Blood	1	0.6	2	1.6	2	3.7	4	2.2
None	157	87.2	103	81.7	45	83.3	148	82.2
Don't know	13	7.2	3	2.4	3	5.6	6	3.3

Knowledge of community health services was higher among the leaders than among women of childbearing age and their spouses. Of the leaders interviewed during the followup survey, 10 percent affirmed that a transport system existed in their communities, and close to 17 percent said that a finance plan was available to assist women with expenses related to pregnancy and childbirth (Table 9). None mentioned the existence of a blood plan.

The exposed leaders were better informed of the existence of community health services than were those who had not been exposed. Whereas only 7.1 percent of the unexposed leaders were aware of the existence of a transport plan or financial assistance for women, 12.5 percent of the exposed leaders knew of a transport system and 25 percent were aware of a financial system.

**Table 9. Community Leaders' Knowledge of Health Services in the Community, by Survey**

Type of Service	Community Leaders						
	Baseline	Followup					
	n	Exposed (n=32)		Unexposed (n=28)		Total (N=60)	
		n	%	n	%	n	%
Transport	NA	4	12.5	2	7.1	6	10.0
Financial	NA	8	25.0	2	7.1	10	16.7
Blood	NA	0	0.0	0	0.0	0	0.0
None	NA	22	68.8	23	82.1	45	75.0
Don't know	NA	1	3.1	1	3.6	2	3.3

## MALARIA DURING PREGNANCY

Pregnant women are particularly vulnerable to malaria, because pregnancy lowers their immunity, putting them at high risk for severe illness, anemia, and even death. Maternal malaria increases the risk of miscarriage, premature birth, and low birth weight.<sup>3</sup> In an effort to reduce these harmful effects of malaria on women and their babies, the MNH Program in Burkina Faso partnered with the Centers for Disease Control and Prevention, the National Center for Research and Training of Malaria, and Plan International to conduct research to support policy change and to promote the use of IPT and insecticide-treated nets (ITNs).

This section explores the knowledge of the various groups of respondents about the negative effects of malaria on pregnant women and on children born to women who contract malaria during pregnancy. The analysis also looks at prophylactic measures and at the malaria treatments prescribed to the various groups.

### Knowledge of the Effects of Malaria on Mother and Baby

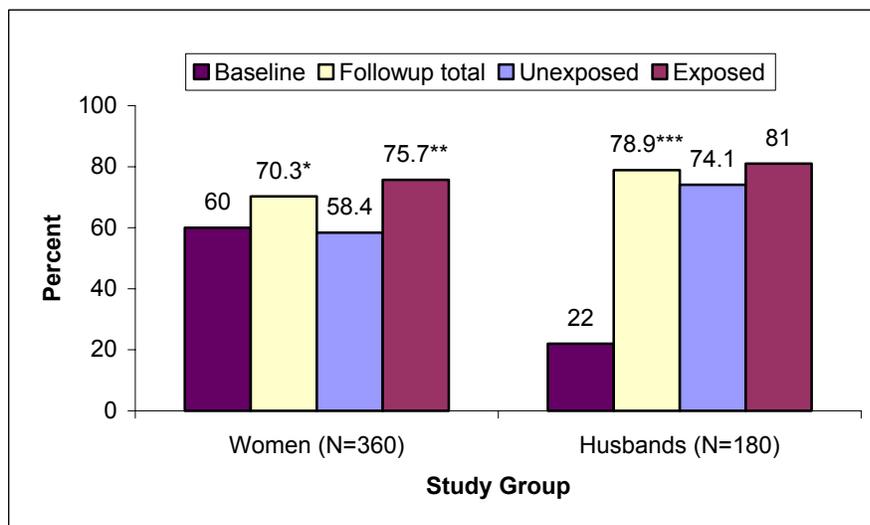
#### *Effects on the Mother*

All groups of respondents were most likely to recognize miscarriage, anemia, and premature labor as negative effects of malaria on mothers. An improvement was found in the level of knowledge of these negative effects at followup, with an increase in the proportion of respondents who recognized

<sup>3</sup> World Health Organization Malaria Website <http://www.who.int/features/2003/04b/en/>

the various effects of malaria and a decline in the proportion of those who were ignorant of the negative effects or claimed that malaria had no adverse effects. Knowledge of miscarriage due to malaria increased significantly ( $p < .05$ ) among women of childbearing age and their husbands between baseline and followup (Figure 10).

**Figure 10. Proportion of Women and Husbands with Knowledge of Miscarriage as a Negative Effect of Malaria, by Survey and Exposure**

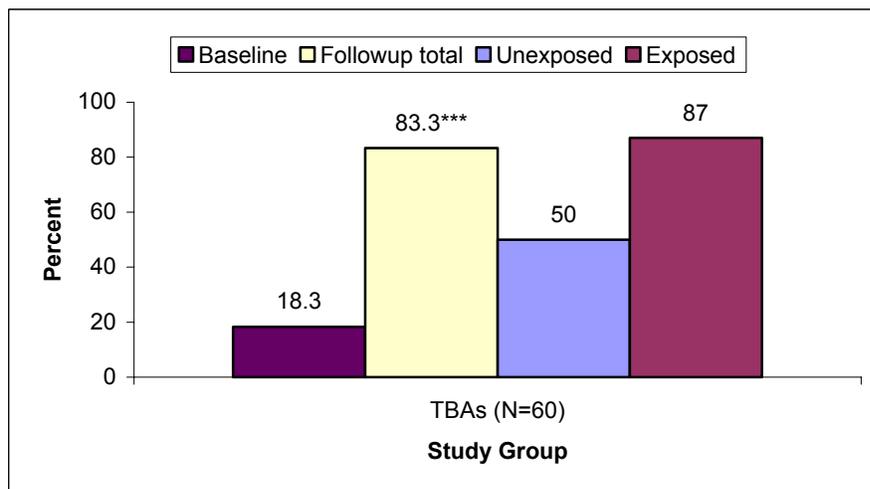


\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

In general, exposed populations knew more about the effects of malaria than did their unexposed counterparts. And exposed women knew significantly more than their unexposed counterparts about the risk of miscarriage due to malaria ( $p < .01$ ).

In addition, TBAs' knowledge of anemia as a negative effect of malaria increased drastically, from 18.3 percent at baseline to 83.3 percent at followup ( $p < .001$ ) (Figure 11).

**Figure 11. Proportion of TBAs with Knowledge of Anemia as a Negative Effect of Malaria, by Survey and Exposure**

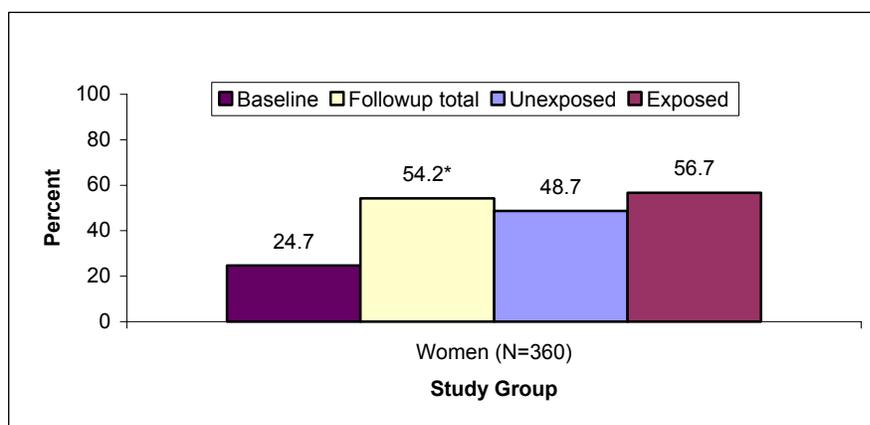


\* $p < .001$

## Effects on the Baby

With regard to the consequences of malaria for a child born to a mother who has contracted the disease during pregnancy, the adverse effects most commonly mentioned by respondents at baseline were increased susceptibility to disease and transmission of the disease to the child. At followup, these two effects remained most recognized by the respondents. Significantly ( $p < .05$ ) more women at followup identified transmission of disease to the baby as a negative effect of malaria (Figure 12).

**Figure 12. Proportion of Women with Knowledge of Malaria Transmission during Pregnancy, by Survey and Exposure**



\* $p < .05$

Again, exposed respondents were better informed than unexposed respondents about the harmful consequences of malaria for children born to mothers affected by malaria during pregnancy.

## Malaria Prevention Methods

Malaria prevention methods emphasized in MNH Program messages include the following:

- Environmental management (elimination of stagnant water and brush)
- Barriers affording physical protection (mosquito nets, insect repellent, protective clothing)
- Chemoprophylaxis (preventive drugs)

Baseline and followup results show a general shift away from drug-based methods of prevention and toward environmental management or protective barriers, particularly the use of insecticide-treated bed nets (ITNs). Reported drug use for malaria prevention declined in all populations.

At the same time, respondents reporting use of ITNs rose sharply. Rates of ITN use increased from no use or almost no use at baseline to more than 30 percent usage among all groups at followup (Appendix Tables A-9 and A-10). Husbands of women of childbearing age reported significantly ( $p < .05$ ) increased use of ITNs from baseline (11.7%) to followup (37.8%). The increase in ITN use was less pronounced in the group of older women, from 0 percent to 15 percent. Although the use of this barrier approach has increased, environmental management measures are the main method of malaria prevention for the majority of the population.

Overall, the groups surveyed exhibited less passivity in terms of taking measures to prevent malaria. The proportion of respondents who had not used any prevention strategy decreased by half among both women of childbearing age and older women ( $p < .05$ ) (**Appendix Tables A-9 and A-10**).

The exposed populations showed greater knowledge of prevention measures than those who had not been exposed. Among women of childbearing age, their spouses, older women, and TBAs, exposed respondents were more likely to use protective measures. In all categories of respondents, unexposed people were twice as likely as their exposed counterparts to take no protective action whatsoever.

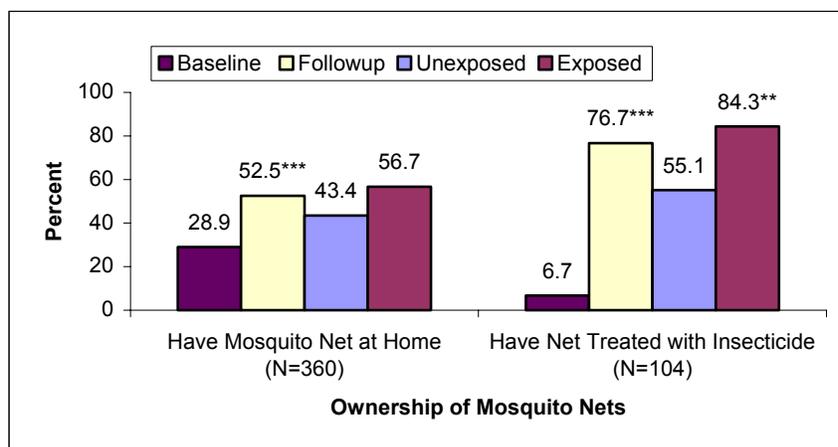
### Insecticide-Treated Mosquito Nets

**Figure 13** shows the proportion of women who owned a mosquito net (either treated or untreated) at baseline and followup. This analysis looks at pregnant women and women who had recently given birth, since they are particularly vulnerable to malaria. In addition, women who use ITNs during pregnancy are more likely to continue to use them after birth, thus providing additional protection for their newborns.

Over the life of the MNH Program, ownership of mosquito nets increased significantly ( $p < .001$ ). Nearly 29 percent of women owned a mosquito net at baseline, and 52.5 percent owned one at followup. Women exposed to the MNH Program were more likely to own a mosquito net (56.7%) than were those not exposed (43.3%).

At followup, 76.7 percent of women reported having an insecticide-treated net, a significant increase ( $p < .001$ ) from baseline, when only 6.7 percent of women had treated nets (**Figure 13**). With regard to MNH Program exposure, 84.3 percent of the exposed women had a net treated within the past year, compared to 55.1 percent of the unexposed women, demonstrating a significant increase ( $p < .01$ ).

**Figure 13. Women with a Mosquito Net at Home and Women with a Net Treated with Insecticide in the Past Year, by Survey and Exposure**



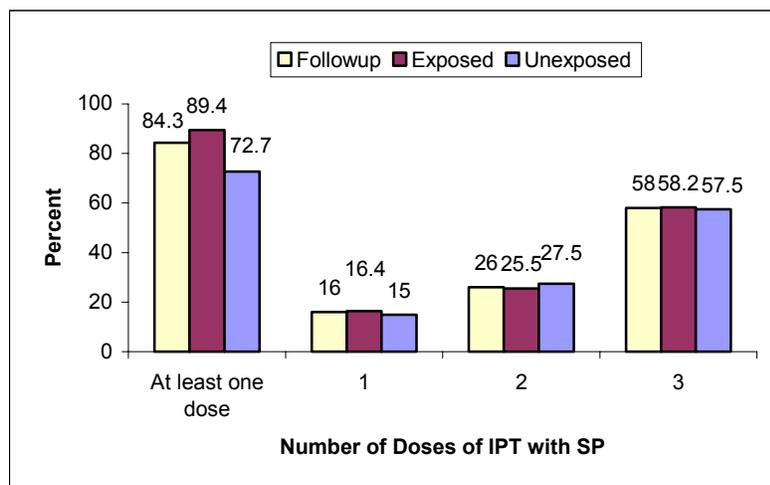
\*\* $p < .01$ ; \*\*\* $p < .001$

## Use of IPT with SP during Pregnancy

Chloroquine has long been administered for malaria chemoprophylaxis, particularly among high-risk populations, such as pregnant women, mothers, and children. However, since 2003, chloroquine has been replaced by sulfadoxine-pyrimethamine (SP) or Fansidar to prevent malaria during pregnancy in the MNH Program area. The survey asked about adherence to the approach of SP-based intermittent preventive treatment (IPT).

The majority of women of childbearing age had adopted this new prophylaxis. Among women who had attended an antenatal clinic, 84.3 percent received at least one dose of IPT with SP (**Figure 14**).

**Figure 14. Number of Doses of IPT with SP Taken by Women Who Had Attended Antenatal Clinic (N=150)**



No significant difference between exposed and unexposed respondents was found with regard to use of SP, most likely because SP is commonly prescribed during antenatal care (ANC) visits and thus should be more closely correlated with ANC attendance than exposure to MNH Program interventions. Interpretation is further complicated by the fact that ANC attendance itself is associated to some degree with Program exposure.

**Figure 14** shows use of IPT by women who had given birth in the previous 12 months. The recommended IPT regimen is three doses of SP during pregnancy. Some women reported having received more than three IPT doses (more than the recommended dosage). These responses may be the result of confusing SP with similar drugs, a memory lapse, or self-medication. These women were counted as part of the group that had received three doses.

## Setting for IPT with SP

Women received intermittent preventive treatment either at a healthcare facility during ANC visits or at home. The majority (75.2%) of the women surveyed received IPT in an ANC setting (**Table 10**). Only one out of five women took SP at home. There are various influences on the choice of where the tablets are taken. Health workers normally have women take the tablets immediately upon their arrival at the healthcare facility. If women do not do so, it is generally because they have not eaten before coming to the healthcare facility. It is recommended that SP be taken after a meal.

Among both exposed and unexposed women, the primary setting for receiving preventive treatment was the healthcare facility. No significant differences were observed between the two groups with regard to treatment setting (**Table 10**).

**Table 10. Setting in Which Women Received IPT with SP, by Survey**

Setting	Pregnant Women and Women Who Had Recently Given Birth						
	Baseline	Followup					
	n	Exposed (n=196)		Unexposed (n=78)		Total (N=274)	
		n	%	n	%	n	%
ANC	NA	149	76.0	57	73.1	206	75.2
Home	NA	47	24.0	21	26.9	68	24.8
Other	NA	0	0.0	0	0.0	0	0.0

## Management of Malaria during Pregnancy

About 10 percent of women surveyed reported that they contracted malaria during pregnancy. These women used various curative treatments, including SP, chloroquine (Nivaquine<sup>®</sup>), and quinine. Of these various chemotherapies, chloroquine (Nivaquine<sup>®</sup>) was used most commonly. However, reported use of this drug was significantly ( $p<.01$ ) lower at followup (45.2%) than at baseline (81.6%) (**Table 11**). SP was prescribed to 16.7 percent of the women. No women reported that quinine was prescribed after 2001. The “other” category, no less important, includes analgesics (aspirin) and other drugs given via injection, IV drip, and self-medication, as well as other products not identified by the women.

**Table 11. Distribution of Women by Prescribed Malaria Treatment, by Survey**

Treatment Prescribed	Pregnant Women and Women Who Had Recently Given Birth							
	Baseline (N=49)		Followup					
	n	%	Exposed (n=30)		Unexposed (n=12)		Total (N=42)	
			n	%	n	%	n	%
SP	-	-	5	16.7	2	16.7	7	16.7
Chloroquine/Nivaquine	40	81.6	14	46.7	5	41.7	19	45.2**
Quinine	-	-	0	0.0	0	0.0	0	0.0
Other	9	18.4	16	53.3	6	50.0	22	52.4

\*\* $p<.01$

## PREPARATION FOR CHILDBIRTH

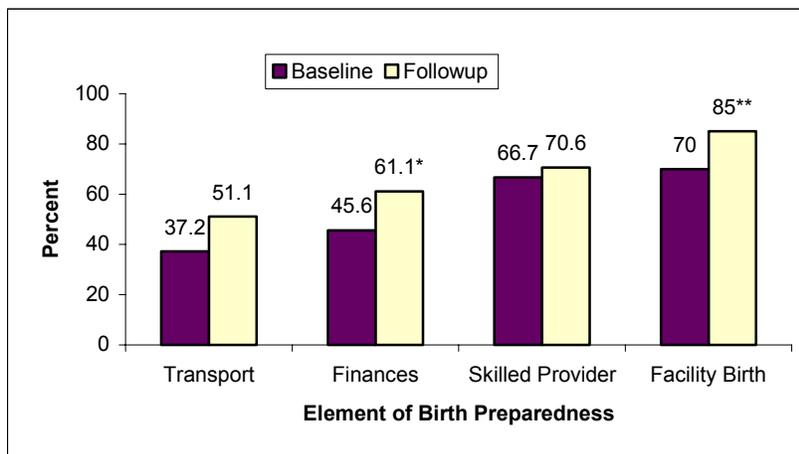
Birth preparedness and complication readiness (BP/CR) involves women, families, and communities in making arrangements to ensure healthy outcomes for women and their newborns. The main elements of BP/CR are planning a mode of transport, saving money to cover the costs of childbirth (including emergency care, if needed), and choosing a place for the birth and a skilled provider.

To gain a greater understanding of women’s birth preparation experiences and execution of their plans, in-depth interviews were conducted with 30 women who gave birth within the previous 12 months and were not included in the quantitative sample. When asked what they did to prepare for the birth, women were quick to suggest ANC attendance as a means to ensure childbirth without complications and good health for their baby. After probing for other aspects of birth preparedness, women readily mentioned the importance of saving money.

## Preparations for Transport

**Figure 15** shows pregnant women’s preparedness for birth with respect to four elements: transport, finances, skilled attendance, and giving birth at a health facility. Pregnant women often do not make adequate provisions for transportation to a health center in case of an obstetric emergency. Whereas 37 percent of the pregnant women surveyed at baseline had made such arrangements, 51.1 percent of the pregnant women surveyed at followup had arranged transportation in case of emergency.

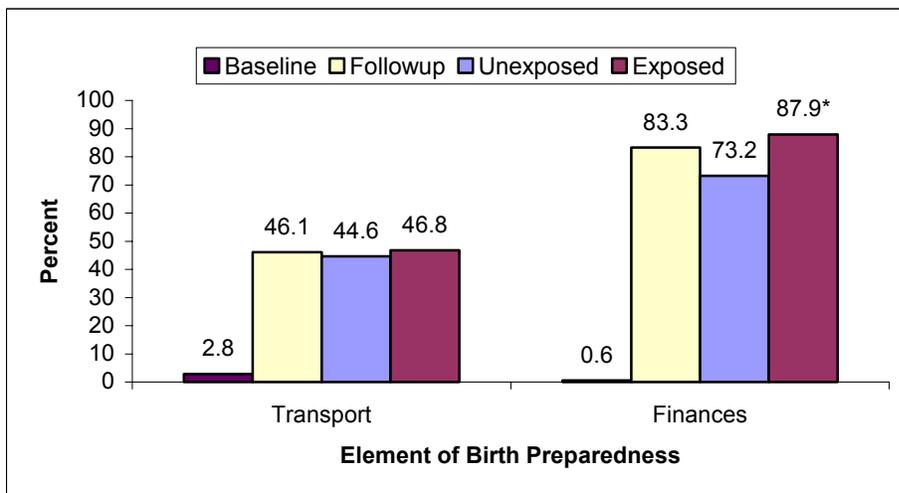
**Figure 15. Birth Preparedness Plans Made by Pregnant Women (N=180), by Survey**



\* $p < .05$ ; \*\* $p < .01$

The situation was more dramatic among the women who had given birth in the previous 12 months: 46.1 percent had made arrangements for transport at followup, compared to 2.8 percent at baseline (**Figure 16**).

**Figure 16. Transport and Finance Plans Made by Women Who Had Given Birth in the Previous 12 Months (N=180), by Survey and Exposure**



\* $p < .05$

Although there was a huge increase in the number of women who included transportation in their birth preparations, the in-depth interviews revealed that few women who had recently give birth had planned a mode of transportation before it was needed. Most women initiated transportation (by foot, bicycle, or moped) when labor started, assuming a family member or neighbor would be available when needed.

A 35-year-old who had not heard of birth preparedness explains her transportation situation:

*“I don’t have any mode of transport. But there are certain people in the family who will help bring you in case you need. I thought that at the time I would feel the labor starting, within the family, I could find someone who would take me to the health center. Since we live together, there are those who have a mode of transportation and she goes with them.”*

A 22-year-old, who had heard of birth preparedness, expresses her view that it is considered the husband’s responsibility to bring the woman to the health center:

*“Can your husband abandon you in this situation? If he sees that you started labor, there is not a choice. He would do his best to bring you to a health center. For that there is not a discussion with him because it is his duty.”*

Despite the general attitude of not arranging transport beforehand, several women did have a plan, including this 28-year-old woman who had heard of birth preparedness:

*“You see birth is very delicate and many things can happen just before or during delivery. It is necessary to give birth with medical assistance and there is a CSPA that one can benefit from. So to benefit it is necessary that the woman be taken there. So in this way you plan a mode of transport to avoid giving birth at home and you can arrive in time to the maternity rather than giving birth on the way. That is why we discussed it and my husband knew that he was going to take me when the moment came.”*

## Financial Preparations

Women were more likely to have a savings plan than a transport plan. At baseline, 45.6 percent of pregnant women reported having a financial plan. The proportion at followup was 61 percent (see **Figure 15**), a significant increase ( $p < .05$ ). Pregnant women who had been exposed to the MNH Program were 15 percent more likely than their unexposed counterparts to have made such arrangements.

Among women who had given birth in the previous 12 months, the pattern was similar to the one described above. At baseline, 0.6 percent of the women had saved money for the birth and in case of an emergency, whereas 83.3 percent of the women at followup reported having a savings plan (see **Figure 16**). In addition, significantly ( $p < .05$ ) more women exposed to the MNH Program (87.9%) made financial plans than did their unexposed counterparts (73.2%).

Saving money was a salient issue in the in-depth interviews, as is evident in the quantitative data. All but two women mentioned saving money for ANC visits, unforeseen costs due to birth complications, buying essentials such as food, soap, and clothes for the mother and newborn, and as a means to avoid borrowing money from others.

A 39-year-old who had heard of birth preparedness asserted the importance of a savings plan:

*“It’s good, something that I thought about and planned. I say that when I knew I was pregnant that it was necessary to save 5 francs every time I earned 15 francs. This helped me face the expenses that would come with the pregnancy, during the birth and even after the birth.”*

Both women who did not save money referred to their husbands’ responsibility for earning and saving money as their reason for not saving. One of them said:

*“He knows it is him that has to assure all financial activities.”*

Women generated income for their savings plans mostly through agricultural and market activities, including selling millet, peanuts, *dolo* (local millet beer), and shea butter. Their husbands had savings plans as well, primarily from agriculture and raising livestock.

Several women mentioned learning about the importance of financial planning and how to save money at ANC visits. Healthcare workers explained a method that almost every woman revealed; save half of what is earned for the day and spend the other half.

## Preparations for the Birth Setting

Arranging to give birth in a health facility was the element of birth preparedness most frequently followed by pregnant women. At baseline, 70 percent of pregnant women stated that they intended to give birth in a health facility (see **Figure 15**). At followup, 85 percent of women had made such arrangements, a significant increase ( $p < .01$ ).

A greater proportion of exposed pregnant women than unexposed pregnant women planned to give birth in a health facility (87%). However, the proportion of unexposed women who had made such provisions was also high (80.7%).

## Discussions between Women and Husbands about Pregnancy and Childbirth

Preparing for childbirth also involves discussions about the pregnancy and BP/CR between a husband and wife. Of the women surveyed at followup, only about half reported having had a discussion about pregnancy or childbirth plans with their husbands.

Improvements were noted between baseline and followup in discussing arrangements for a means of transport, financial planning, and the choice of a health facility as the setting for childbirth (**Table 12**). The proportion of women who had discussed giving birth at a health facility with their husbands rose from 18.5 percent at baseline to 52.2 percent at followup, a significant increase ( $p < .01$ ). In addition, women exposed to the MNH Program were more likely to discuss arrangements for transport, finances, and assistance of a skilled provider at birth.

**Table 12. Women’s Discussions with Their Husbands about Arrangements for Pregnancy or Childbirth, by Survey**

Arrangements Discussed	Pregnant Women and Women Who Had Recently Given Birth							
	Baseline (N=92)		Followup					
	n	%	Exposed (n=147)		Unexposed (n=39)		Total (N=186)	
			n	%	n	%	n	%
Transport	2	2.2	10	6.8	1	2.6	11	5.9
Financing	28	30.4	79	53.7	8	20.5	87	46.8
Skilled provider	6	6.5	7	4.8	0	0.0	7	3.8
Birth at a health facility	17	18.5	73	49.7	24	61.5	97	52.2**
Blood transfusion	0	0.0	0	0.0	0	0.0	0	0.0

\*\* $p < .01$

\*The different variables in this table are grouped from open-ended responses.

In the qualitative interviews, many women denied having conversations about pregnancy and BP/CR with their husbands, reflecting the patriarchal society of the Mossi. Certain themes recurred in the interviews, including “*we don’t do that here*” and “*it is tradition and since it is tradition, we could not discuss it.*” After much probing by the interviewer, some women hesitantly disclosed having a brief conversation with their husbands about ANC and/or preparing for the birth.

Despite the ingrained traditional values in some families, a few women acknowledged having discussions with their husbands after receiving information about birth preparedness from health workers. For example, a 27-year-old woman who had heard of birth preparedness said:

*“It was with my husband only that I discussed it because you see, when I went to the health center, they told me to go say to my husband to start to save money together because anything can happen during the pregnancy. During the course of the pregnancy or during the birth, there could be complications that make the birth difficult. So effectively, I spoke with my husband about that. My husband and I discussed it and God truly helped us, there weren’t any complications, all went well.”*

## Discussions between Women and Other Persons about Pregnancy and Childbirth

Because family and community members also play a critical role in safe motherhood and BP/CR, women were asked about their discussions about pregnancy and BP/CR with people other than their husbands. At followup, the women reported that their discussions with other people centered mainly on arranging for the assistance of a skilled provider during childbirth (40%) (Table 13).

**Table 13. Women’s Discussion with Other Persons about Arrangements for Pregnancy or Childbirth, by Survey**

Arrangements Discussed	Pregnant Women and Women Who Had Recently Given Birth							
	Baseline*		Followup					
	n	%	Exposed (n=33)		Unexposed (n=22)		Total (N=55)	
			N	%	n	%	n	%
Transport	NA	NA	3	9.1	0	0.0	3	5.5
Financing	NA	NA	4	12.1	2	9.1	6	10.9
Skilled provider	NA	NA	13	39.4	9	40.9	22	40.0
Birth at a health facility	NA	NA	0	0.0	0	0.0	0	0.0
Blood transfusion	NA	NA	0	0.0	0	0.0	0	0.0

\* During the baseline survey, the questions were open-ended, and the responses could not be recoded to correspond to those in the table in order to make comparison possible.

## Discussions with Other Women about Birth Preparedness

Fewer women reported discussions with others (n=55) in the followup survey. However, during the course of the in-depth interviews, women more willingly affirmed discussions with family members and friends, and alluded to having brief conversations about their pregnancy or health problems. A 24-year-old woman who had heard of birth preparedness said: *“When we met under that tree, I talked about my pregnancy and in the group another woman was going to start ANC and the others decided to go a certain day. That’s what we discussed.”*

## Intention to Give Birth with a Skilled Provider

Pregnant women were asked whom they intended to have assist with the birth of their baby. A large proportion of women said they planned to have a skilled provider at the birth (66.7% at baseline, 70.6% at followup). Women showed a growing preference for certain types of attendants—most notably, the number of women who planned to use an auxiliary midwife increased from 40 percent in 2001 to 60 percent in 2004, a significant increase ( $p < .01$ ). This is an important finding because auxiliary midwives are considered skilled providers. In addition, there was a decrease in the number of women planning to give birth with the assistance of *accoucheuses villageoises* (28.9% in 2001, 16.1% in 2004). Because the *accoucheuses villageoises* are considered unskilled providers, the decline demonstrates a shift away from unskilled providers and toward skilled providers (Table 14).

**Table 14. Women’s Intended Birth Attendant, by Survey**

Intended Birth Attendant		Pregnant Women							
		Baseline (N=180)		Followup					
		n	%	Exposed (n=123)		Unexposed (n=57)		Total (N=180)	
				n	%	n	%	n	%
Skilled provider	Physician <sup>1</sup>	-	-	1	0.81	0	0.00	1	0.6
	Registered midwife	28	15.6	5	4.07	2	3.51	7	3.9
	Nurse	20	11.1	8	6.50	3	5.26	11	6.1
	Auxiliary midwife	72	40.0	73	59.35	35	61.40	108	60.0**
<i>Accoucheuse traditionnelle</i>		3	1.7	1	0.81	4	7.02	5	2.8
<i>Accoucheuse villageoise</i>		52	28.9	20	16.26	9	15.79	29	16.1
Family member		3	1.7	5	4.07	3	5.26	8	4.4
None		0	0.0	0	0.00	0	0.00	0	0.0
Other		1	0.6	7	5.69	0	0.00	7	3.9
Don’t know		1	0.6	3	2.44	1	1.75	4	2.2
Skilled providers <sup>2</sup>		120	66.7	87	70.73	40	70.18	127	70.6
Other attendants		60	33.3	36	29.27	17	29.82	53	29.4

\*\* $p < 0.01$

<sup>1</sup>This option did not exist in 2001.

<sup>2</sup>The category “skilled provider” includes physicians, registered midwives, nurses, and auxiliary midwives.

As for women’s intentions regarding the setting for childbirth, the vast majority preferred a health facility (85% in 2004, 15% more than in 2001), a significant increase ( $p < .01$ ) (**Table 15**). The category “other” includes a PSP (poste de santé primaire)—a primary health post for basic healthcare in isolated and distant areas, which is not staffed by skilled providers.

**Table 15. Women’s Intended Setting for Childbirth, by Survey**

Intended Setting for Childbirth		Pregnant Women							
		Baseline (N=180)		Followup					
		n	%	Exposed (n=123)		Unexposed (n=57)		Total (N=180)	
				n	%	n	%	n	%
Home		22	12.2	3	2.4	3	5.3	6	3.3
Health facility		126	70.0	107	87.0	46	80.7	153	85.0**
Other		32	17.8	11	8.9	8	14.0	19	10.6
Don’t know		0	0.0	2	1.6	0	0.0	2	1.1

## Childbirth Preparedness Score

Based on the variables identified as the principal indicators of preparedness for childbirth among pregnant women, we constructed a composite indicator of what might be called best practices for safe motherhood. The final result was a calculated score based on the following criteria:

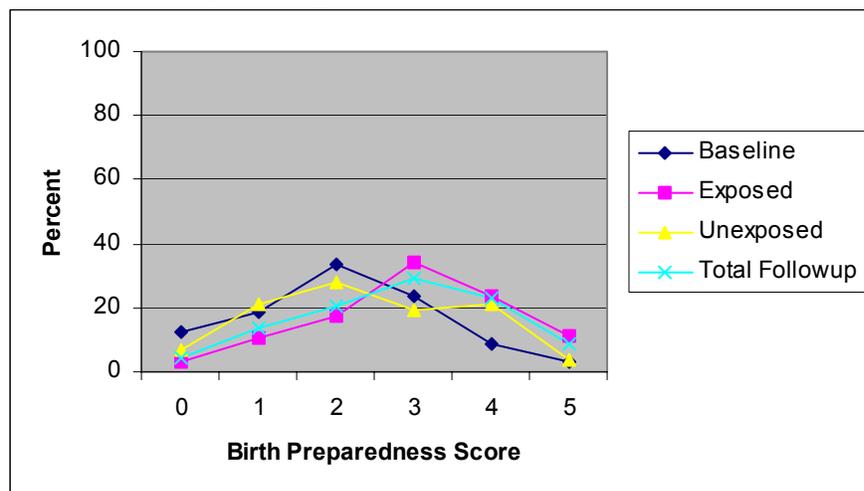
- A minimum of two ANC visits during pregnancy
- Planning for the assistance of a professional healthcare provider during childbirth
- Arranging for a means of emergency transport
- Planning for financing to cover emergencies
- Ability to name, without prompting, at least two danger signs during pregnancy (bleeding during pregnancy, severe headaches, visual disturbances/loss of vision, fever, swelling of the face/hands, and increased/decreased fetal movement)

The childbirth preparedness score is not weighted; a simple sum was calculated from the values (0 for no, 1 for yes) of each intermediate variable. The result was a scale ranging from 0 (lowest value) to 5 (highest value and therefore the ideal). Between these two values, value 3 was the median score.

More than 61 percent of the pregnant women surveyed in 2004, compared to 35.5 percent in 2001, had a score of 3 or more (**Figure 17**). This is a substantial improvement of some 25 percent. Another important finding is that the proportion of respondents who had the lowest possible score in 2001 decreased by more than half, while the proportion achieving the highest score doubled over the same time period, although it was still quite small (3.3% in 2001, 6.9% in 2004). When the data on exposed and unexposed pregnant women were analyzed, exposed women scored much higher.

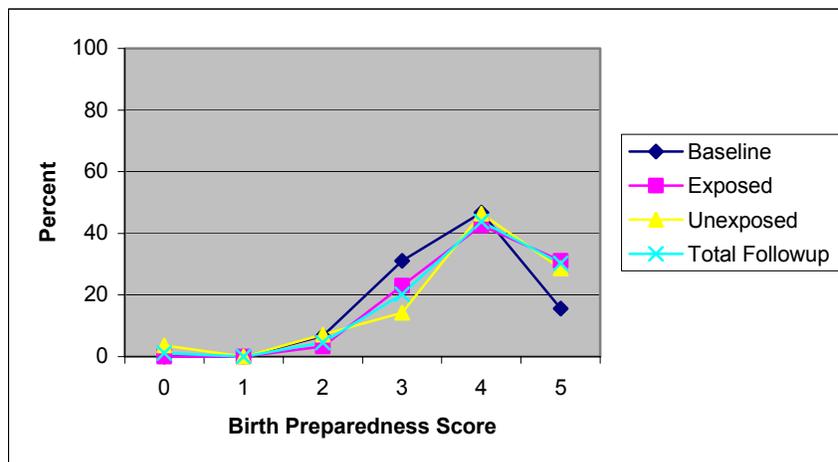
The benefits associated with MNH Program interventions can be seen both in the differences between the baseline and the followup surveys and in the differences between the exposed and unexposed women.

**Figure 17. Distribution of Childbirth Preparedness Scores among Pregnant Women (N=180), by Survey and Exposure**



As for the husbands, the vast majority—93.3 percent—scored at least 3 in both 2001 and 2004 (Figure 18). This finding suggests that the men, who already had a somewhat higher level of knowledge, had only to reinforce it, unlike the women, who had much more to learn.

**Figure 18. Distribution of Childbirth Preparedness Scores among Husbands (N=90), by Survey and Exposure**

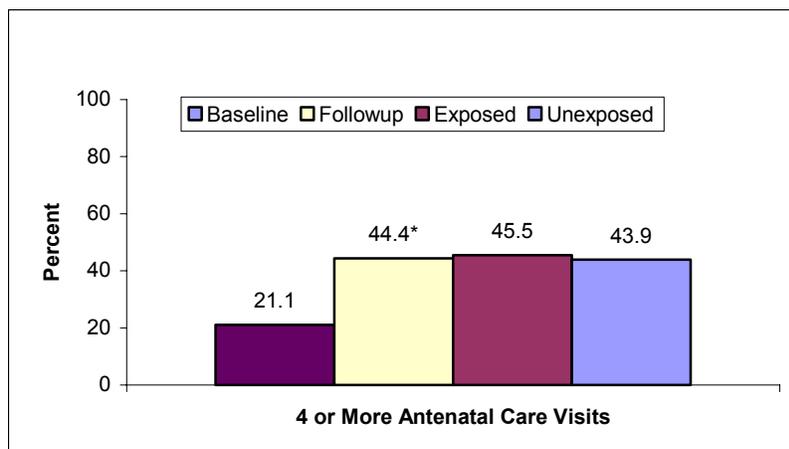


## USE OF SERVICES

### ANC Attendance

The World Health Organization (WHO) recommends at least four antenatal care visits at regular intervals throughout pregnancy.<sup>4</sup> A significant ( $p < .01$ ) improvement in compliance with this standard was noted between the baseline survey in 2001 and the followup survey in 2004. The proportion of women who had given birth in the last 12 months and who reported making four or more visits rose from 21.1 percent to 44.4 percent (Figure 19). In other words, the proportion more than doubled.

**Figure 19. Percentage of Women Who Had Recently Given Birth Who Made Four or More ANC Visits, by Survey and Exposure**



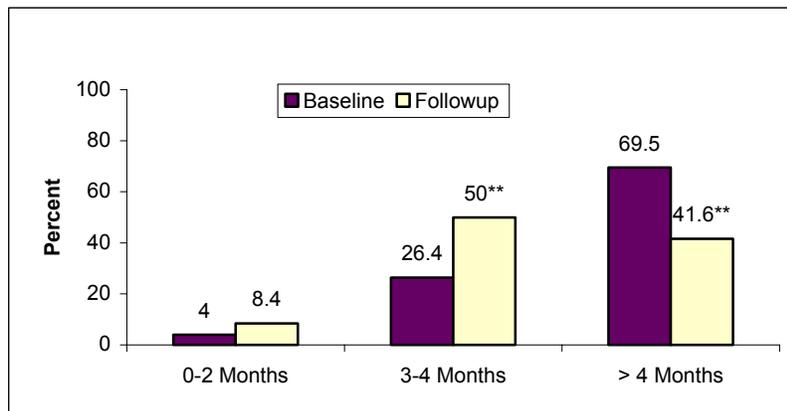
\* $p < .05$

<sup>4</sup> <http://www.who.int/reproductive-health/docs/pcpnc.pdf>

The findings of the followup survey are especially encouraging: All women interviewed had made at least one ANC visit. Better yet, there has been a progressive rise in the number of visits. On average, the number of visits increased by half a visit over the 3-year intervention period.

The timing of the first ANC visit also improved between the baseline and followup surveys. The followup survey results demonstrated that increasing numbers of women were making ANC visits and that they were attending their first visit earlier in pregnancy, with a significant increase ( $p < .01$ ) in the proportion of women who made their first ANC visit at 3–4 months' gestation and a significant ( $p < .01$ ) decrease in the proportion of women made their first ANC visit at greater than 4 months' gestation (Figure 20).

**Figure 20. Timing of First Antenatal Care Visit among Women Who Had Recently Given Birth, by Survey**



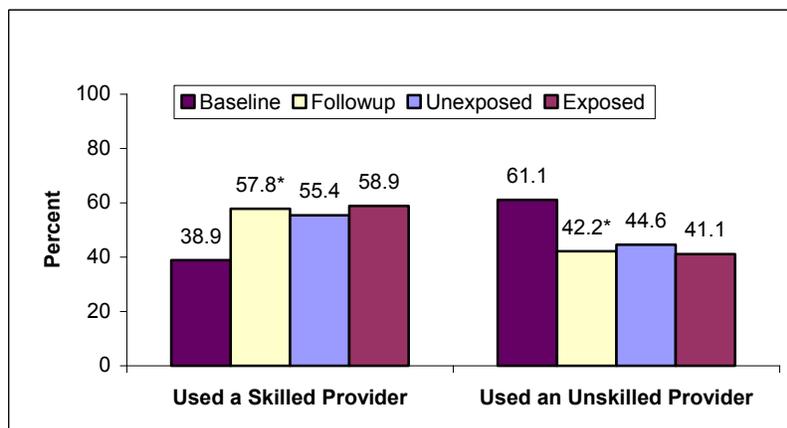
\*\* $p < .01$

## Birth Attendant and Setting

### Birth Attendant

At followup, 58 percent of women who had given birth in the past 12 months reported having sought the assistance of a skilled birth provider, a significant ( $p < .05$ ) improvement of 19 percent over the baseline survey. In addition, significantly ( $p < .05$ ) less women gave birth with an unskilled provider at followup (42.2%) compared to baseline (61.1%) (Figure 21).

**Figure 21. Use of Skilled Provider among Women Who Had Recently Given Birth, by Survey and Exposure**



\* $p < .05$

This success can be attributed to the MNH Program’s intervention. Confirmation of this assertion can be seen in the significant ( $p<.05$ ) increase in the proportion of women seeking assistance from auxiliary midwives—an increase from 15.6 percent at baseline to 41.7 percent at followup.

In addition, there was a decrease (from 52% to 34%) in the number of women attended by TBAs (*accoucheuses villageoises* and *accoucheuses traditionnelles*), which suggests that fewer women are seeking care from unskilled providers (**Table 16**). When the proportions of exposed and unexposed women who gave birth with the assistance of a skilled professional are compared, the difference is not statistically significant. There are still a relatively high number of births attended by TBAs. However, this high number may be a reflection of a shortage of health facilities and medical personnel in villages and long travel distances to the nearest facility, which women discussed in the in-depth interviews.

**Table 16. Type of Birth Assistance Used by Women Who Had Recently Given Birth, by Survey**

Assistant/Attendant		Women Who Had Recently Given Birth							
		Baseline (N=180)		Followup					
		n	%	Exposed (n=124)		Unexposed (n=56)		Total (N=180)	
				n	%	n	%	n	%
Skilled Provider	Physician	1	0.6	1	0.8	0	0.0	1	0.6
	Registered midwife	28	15.6	5	4.0	5	8.9	10	5.6
	Nurse	13	7.2	13	10.5	5	8.9	18	10.0
	Auxiliary midwife	28	15.6	54	43.5	21	37.5	75	41.7*
<i>Accoucheuse traditionnelle</i>		13	7.2	6	4.8	5	8.9	11	6.1
<i>Accoucheuse villageoise</i>		80	44.4	37	29.8	13	23.2	50	27.8
Family member		12	6.7	4	3.2	4	7.1	8	4.4
None		2	1.1	2	1.6	0	0.0	2	1.1
Other		3	1.7	2	1.6	3	5.4	5	2.8
Don't know		0	0	0	0	0	0	0	0

\*  $p<0.05$

Some of the women who gave birth in a health center were asked if they had planned for a specific provider to attend the birth. Everyone assumed a skilled provider (auxiliary midwife or nurse) would be readily available to render assistance and expressed not having an option to choose the birth attendant. For example, a 39-year-old woman who had heard of birth preparedness said:

*“Only I know that a health worker in the occurrence of birth, this one or that one would be there to take care of me that day I went. Not knowing who was going to be working, we don’t have the choice.”*

The women who gave birth with a TBA did not allude to making prior arrangements with the village midwives, because they planned to give birth in a health center. When they determined they could not get to a health facility, a family member went to find the TBA to assist with the birth. A 44-year-old woman who had heard of birth preparedness said:

*“It was me and the other wives that went. Arriving at the PSP, they went to find Beatrice (TBA). There are two TBAs. The other is named Zarata and she lives right next to the PSP. Zarata came first before Beatrice came.”* Another woman, who was 34 years old and had heard of birth preparedness, said:

*“She’s a known midwife. In case it is impossible to arrive at the hospital, you can find her.”*

## **Birth Setting**

The trend in choice of birth setting is similar to the trend in skilled attendance at birth. At followup, nearly 60 percent of women stated that they had given birth in a health facility, compared to 46.1 percent at the time of the baseline survey (**Table 17**). The reduction in the frequency of home births between baseline and followup was matched almost exactly by a rise in births in health facilities. A closer look at the data on choice of birth setting at followup reveals that women who had not been exposed to the MNH Program were more likely than those who had been exposed to give birth at home (32.1% versus 23.4%).

**Table 17. Birth Setting Used by Women Who Had Recently Given Birth, by Survey**

Birth Setting	Women Who Had Recently Given Birth							
	Baseline (N=180)		Followup					
	n	%	Exposed (n=124)		Unexposed (n=56)		Total (N=180)	
			n	%	n	%	n	%
Home	73	40.6	29	23.4	18	32.1	47	26.1
Health facility	83	46.1	78	62.9	29	51.8	107	59.5
Other	24	13.3	17	13.7	9	16.1	26	14.4

Many women apparently do not follow through with their plans to give birth in a health center. Although 85 percent of women intended to give birth in a health center, only 59.5 percent actually did. The in-depth interviews gave more insight into women’s experiences with executing their plans regarding place of birth. Distance to a health center and the fear of giving birth on the way there was the most salient barrier that prevented women from giving birth where they had originally planned. As shown in **Appendix Table A-2**, women have to travel an average of 22.8 kilometers through remote, rural areas in order to reach a health facility.

Aside from three women who planned to give birth at a PSP (included in the “other” category), most women anticipated giving birth at a health center. Despite their intentions, however, eight women gave birth at home and seven gave birth at a PSP. Women’s experiences of giving birth in each location are described below.

**Health center.** The main incentive for giving birth at a health center is health security. Women also gave the following reasons for using a health center:

- Complications can arise at home.
- Health workers in the health centers are more qualified and competent.
- It is routine for women to give birth in a health center.
- ANC is done at the health center.

A 39-year-old who had heard of birth preparedness gave the following explanation for her choice:

*“The reason I gave birth in a medical center is for health security. You know if you give birth at home in your bedroom, you can get certain illnesses. On the other hand, if you give birth at a medical center the health agents know what to do, they can protect you and the baby from the illnesses. Also they prescribe preventive medicines to protect you from eventual illnesses. That’s why I prefer to go to a medical center.”*

**PSP.** While most women intended to give birth in a health center, some birthed in a PSP because they could not get to a health center in time. One 37-year-old woman who had heard of birth preparedness declared:

*“I could not arrive to the CSPS in time so when the labor started, I preferred to go directly to Pissi, right nearby and it was there that I gave birth with the assistance of the trained TBA you find there.”*

All of the women who planned on giving birth at a PSP lived far from a health center. Distances ranged from 23 kilometers to more than 37 kilometers. These women emphasized that TBAs would refer in case of complications. For example, a 37-year-old who had heard of birth preparedness said:

*“The TBAs of the PSP, if they see there is a complication that they can’t handle, they will refer you to a more qualified health center.”*

Another woman, a 44-year-old who had heard of birth preparedness, attested to referral to a higher level if needed:

*“For a birth that does not present a danger sign, we give birth at the PSP where the women give birth. However, if the birth is difficult or danger signs are present the woman has to be transported to the CSPS of Kalwartenga, and there she benefits from the help of the health professionals.”*

**Home.** Women who gave birth at home acknowledged a risk of giving birth on the way to a health center. A 22-year-old who had not heard of birth preparedness said:

*“If that starts and I have time and the ability to arrive there, before giving birth, I’d go, but if things are going quickly and I risk giving birth on the way, I’d stay at the house to give birth.”*

Accessibility is another obstacle in reaching the health center. A 23-year-old woman who had heard of birth preparedness said:

*“I gave birth at home because the health center is far away and it was during the rainy season. During the rainy season, we are enclosed by two bodies of water, and since it was during the night, if I went to the health center, I would not be able to arrive there...even if you are with a moped, during the rainy season you cannot arrive. The person risks giving birth on the way and there, that would be me on the way.”*

One of two women who live in the same catchment area and gave birth at home describes the plans she made during the pregnancy and disappointment in giving birth at home. The 24-year-old woman said:

*“My husband and I prepared all. We bought a layette for the baby, a bucket, and other materials. When I sensed the birth, I went to the CSPS, and there they told me that it wasn’t labor but malaria accompanied by diarrhea. They treated me and told me they couldn’t keep me because the labor hadn’t started. The CSPS was burglarized so they*

*didn't want to keep me and they gave me an injection and asked me to go back home. The same evening I sensed the same pain, and I thought that it was malaria that was getting worse. In the middle of the night, the pain got even worse and then I understood that it was not malaria but it was the birth. So in this way I gave birth at home against my wishes."*

**Attitudes related to giving birth at health center.** The qualitative interviews revealed an overwhelming attitude that giving birth in a health center is better than giving birth at home. Women identified reasons such as decreased risk of illness, better healthcare with competent healthcare workers, and referral for complications. A 23-year-old woman described the benefits of giving birth at a health center:

*"I didn't choose to give birth at home because there are a number of risks and dangers; on the other hand these risks are less at the health center. In addition, at the CSPS there is a possibility of referral to a higher level...giving birth at home with the assistance of the older women can cause death of the baby or even the mother during the birth."*

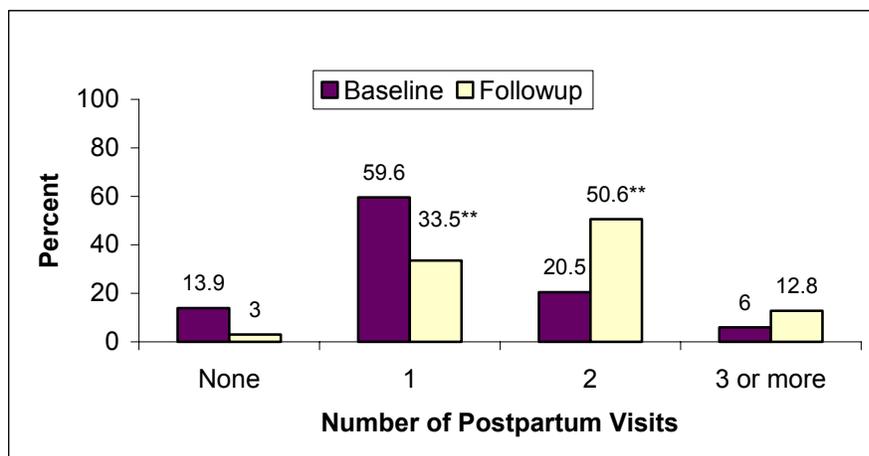
Another women, 24 years old, stressed her opinion about the danger of birth at home:

*"A woman who gives birth at home can easily lose her life because of that. Sometimes you give birth at home and you find that there is a problem of blood and they don't know what to do so the person dies. At the CSPS if after the birth you have a problem of blood, the agents (health workers) know...although at home there are problems that you are going to meet. That's why when I went to give birth, my husband said to go to the CSPS."*

## Postpartum Care

The analysis of postpartum care also revealed hopeful signs. At baseline, 14 percent of women reported making no postpartum visits, while at followup the proportion was only 3 percent. Even better, 50.6 percent of women who had given birth in the previous 12 months made two postpartum visits—more than twice the proportion found at baseline, a significant increase ( $p<.01$ ) (**Figure 22**).

**Figure 22. Number of Postpartum Visits Made by Women within 6 Weeks after Childbirth, by Survey**



\*\* $p<.01$

## Timing of Postpartum Visits

The proportion of women reporting no postpartum visits at followup was half the proportion at baseline (**Table 18**). Close to 60 percent of women at followup, compared to 39.4 percent at baseline, said they had sought postpartum care in the first week following childbirth—a significant increase ( $p<.01$ ). In addition, nearly nine out of ten women (87.2%) at followup reported having their first postpartum visit within 30 days after childbirth, compared to three out of four women at baseline—another significant improvement ( $p<.01$ ).

These data point to an improvement in attitudes, which is borne out by the respondents' statements with regard to the adoption of good practices for safer motherhood. Indeed, the women surveyed showed that they were aware that care is still necessary 1.5 to 2 months after childbirth.

**Table 18. Timing of First Postpartum Visit, by Survey**

Timing of First Postpartum Visit	Women Who Had Recently Given Birth							
	Baseline (N=180)		Followup					
	n	%	Exposed (n=124)		Unexposed (n=56)		Total (N=180)	
			n	%	n	%	n	%
No visits	30	16.7	11	8.9	5	8.9	16	8.9
Less than 6 hours after childbirth	0	0.0	1	0.8	1	1.8	2	1.1
Less than 1 week (0–7 days)	71	39.4	75	60.5	30	53.6	105	58.3**
Less than 1 month (0–30 days)	136	75.6	108	87.1	49	87.5	157	87.2**
Less than 2 months (0–60 days)	150	83.3	113	91.1	50	89.3	163	90.6*
Less than 6 months (0–180 days)	150	83.3	113	91.1	51	91.1	164	91.1*

\* $p<.05$ ; \*\* $p<.01$

## Breastfeeding

According to WHO, “Breastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants; it is also an integral part of the reproductive process with important implications for the health of mothers.”<sup>5</sup> The findings from Koupéla suggest that breastfeeding is quite widespread in Burkina Faso: 98.9 percent of women who had recently given birth at baseline and 99.4 percent at followup were breastfeeding (**Table 19**).

Also according to WHO, “As a global public health recommendation, infants should be exclusively breastfed for the first 6 months of life to achieve optimal growth, development and health. Thereafter, to meet their evolving nutritional requirements, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to 2 years of age or beyond. Exclusive breastfeeding from birth is possible except for a few medical conditions, and unrestricted exclusive breastfeeding results in ample milk production.”<sup>6</sup>

<sup>5</sup> World Health Organization (WHO). 2002. *Infant and Young Child Nutrition: Global Strategy on Infant and Young Child Feeding*. Report by the Secretariat. WHO: Geneva. (Document A55/15).

<[http://www.who.int/gb/ebwha/pdf\\_files/WHA55/ea5515.pdf](http://www.who.int/gb/ebwha/pdf_files/WHA55/ea5515.pdf)> (22 August 2004).

<sup>6</sup> World Health Organization (WHO). 2002. *Infant and Young Child Nutrition: Global Strategy on Infant and Young Child Feeding*. Report by the Secretariat. WHO: Geneva.

**Table 19. Age of Children Being Breastfed, by Survey**

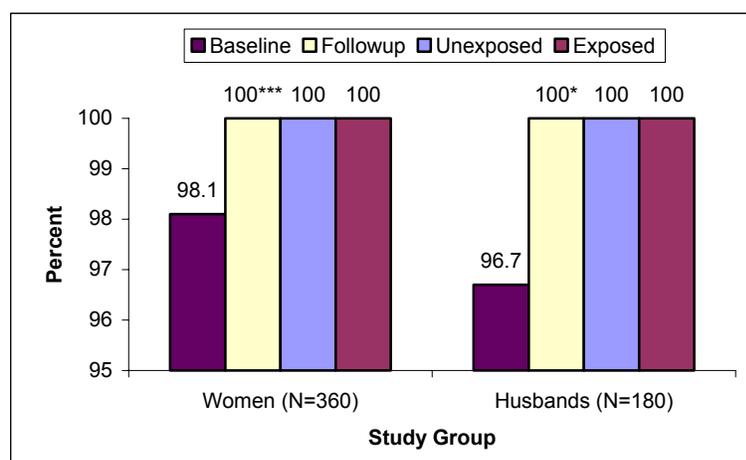
Age of child	Women Who Had Recently Given Birth							
	Baseline (N=178)		Followup					
	n	%	Exposed (n=124)		Unexposed (n=55)		Total (N=179)	
			n	%	n	%	n	%
<1 month	3	1.7	9	7.3	4	7.3	13	7.3
1–2 months	34	19.1	31	25.0	10	18.2	41	22.9
3–4 months	48	26.97	29	23.4	15	27.3	44	24.6
5–6 months	37	20.79	21	16.9	9	16.4	30	16.8
>6 months	56	31.46	34	27.4	17	30.9	51	28.5
<b>% Overall total (180)</b>	<b>98.9</b>		<b>100</b>		<b>98.2</b>		<b>99.4</b>	

Among women who had a child less than 12 months old, the proportion practicing exclusive breastfeeding rose from 12.8 percent at baseline to 40.6 percent at followup—a threefold increase. This led to a reduction in the proportion of infants being fed foods and liquids other than breast milk. The duration of exclusive breastfeeding, however, remains relatively short. According to the 2003 Demographic and Health Survey (DHS) for Burkina Faso, 18.2 percent of children less than 6 months of age and 14 percent of those 6–9 months old were being exclusively breastfed.

### Knowledge of HIV/AIDS

The survey included questions about the respondents’ knowledge of HIV/AIDS. A fraction of respondents at baseline (2% of the women who were pregnant or had a child less than 12 months of age and 3.3% of their husbands) said they had not heard of HIV/AIDS, and by 2004 all respondents to the followup survey had heard of the disease. This demonstrates a significant increase in awareness ( $p < .01$ ) for women of childbearing age and their husbands. The level of knowledge nationwide, as measured by the National Institute of Statistics and Demography during the 2003 DHS, was 96 percent, which is consistent with the survey findings.

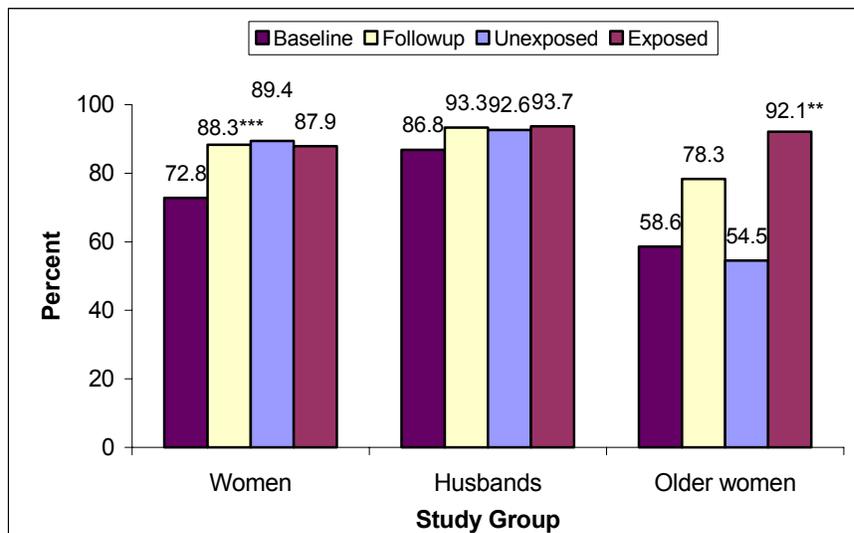
**Figure 23. Awareness of HIV/AIDS among Women and Husbands, by Survey and Exposure**



\* $p < .05$ ; \*\*\* $p < .001$

Between 2001 and 2004 there was a significant narrowing of the gap in knowledge with regard to the possibility that a person in apparent good health can be infected with HIV, that HIV can be transmitted during pregnancy or childbirth, and that HIV can be transmitted through breastfeeding (Figure 24).

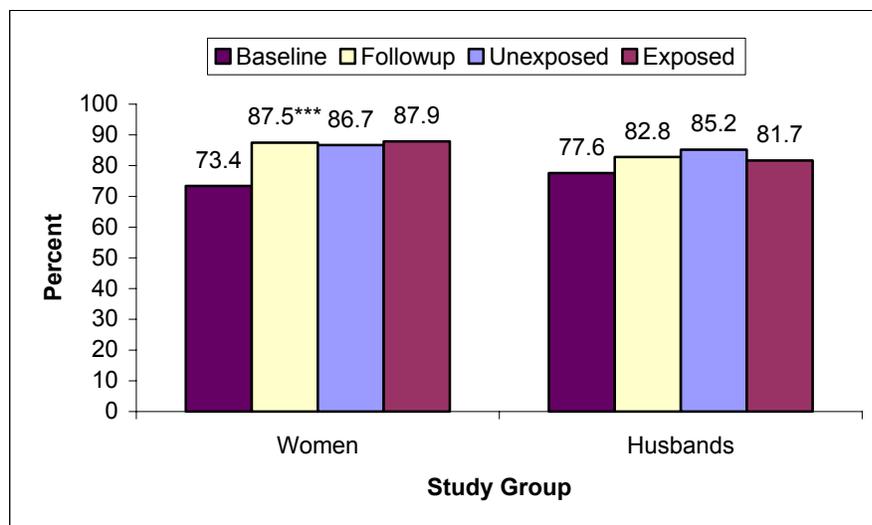
**Figure 24. Knowledge That a Person in Apparent Good Health Can Be HIV-Infected, by Survey and Exposure**



\*\* $p < .01$ ; \*\*\* $p < .001$

Among all categories of respondents, knowledge was greatest of the possibility of HIV transmission during pregnancy or childbirth (percentages ranged between 85% and 96.7%). Between 78.3 percent and 93.3 percent knew that an apparently healthy person could be infected with HIV. And between 75 percent and 87.5 percent knew that HIV can be transmitted through breastfeeding.

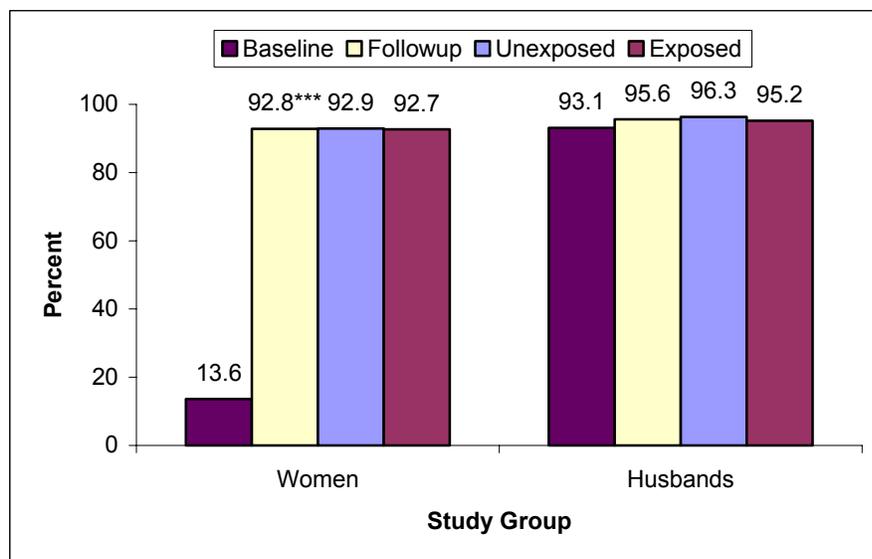
**Figure 25. Knowledge of HIV Transmission through Breastfeeding, by Survey and Exposure**



\*\*\* $p < .001$

Women of childbearing age improved their knowledge about HIV/AIDS most significantly ( $p=.000$ ). Significantly more older women ( $p<.01$ ) who were exposed to the MNH Program knew that a person in apparent good health can be HIV-infected.

**Figure 26. Knowledge of HIV Transmission through Pregnancy or Childbirth, by Survey and Exposure**



\*\*\* $p<.001$

## DISCUSSION AND CONCLUSIONS

### Key Findings

The MNH Program supported behavior change interventions (BCI) in Burkina Faso that have resulted in important improvements in knowledge, birth preparedness, and use of health services among the survey groups examined in this evaluation. Levels of reported knowledge of danger signs, basic newborn care, and HIV/AIDS increased, particularly among women and their husbands. Populations surveyed at followup also showed a greater willingness to take medications, seek the assistance of skilled providers, and go to health facilities for antenatal and postpartum care.

Interestingly, the results of this study also show that even populations that were not directly exposed to the MNH Program interventions often had a higher level of knowledge and practice with regard to safe motherhood at followup, perhaps indicating that some safe motherhood messages and MNH Program BCI initiatives have reached people through indirect sources, such as family and friends who were exposed to MNH Program messages.

### Exposure to MNH Program Interventions

The MNH Program achieved a high level of exposure to Program interventions among the different target populations included in this survey. The overall average level of exposure across survey groups was 70 percent, with variations between the survey groups (ranging from 53.3% for community leaders to 90% for TBAs).

In addition to women of reproductive age and their husbands, TBAs (*accoucheuses villageoises* and *accoucheuses traditionnelles*) were one of the principal targets for the interventions of the MNH Program, and almost all of them (90%) were exposed to Program interventions by the time of the followup survey. This exposure is evidence of the level of involvement of this population in the activities of the MNH Program, given their roles in the area of maternal and neonatal health behavior change. Similarly, the fact that healthcare providers are the primary source of information for most TBAs (94.4%) points to strong interaction between these two types of health workers in the effort to reach out to communities and households to achieve safer motherhood.

Despite their fairly prominent role in the process of preparing for childbirth, older women and community leaders were less exposed to the Program's interventions than women of reproductive age, their husbands, and TBAs. Older women are often a source of help and advice for younger women during pregnancy and childbirth, and after childbirth. In the same way, community leaders play an important part in the process of sensitizing and mobilizing the population to share responsibilities and take collective action, as advocated in the MNH Program messages and social mobilization activities. The incomplete exposure of these key population groups suggests a need for further efforts to improve the quality of the advice and assistance offered to women.

### ***Increases in Awareness and Knowledge***

There were significant improvements between the baseline and followup surveys in the percentages of respondents who spontaneously reported knowledge of danger signs during childbirth and the postpartum period. Among women and their husbands, there were significant increases in percentages reporting knowledge of prolonged labor and abdominal pain as danger signs during childbirth. With respect to the postpartum period, women were significantly more likely at followup to report knowing that loss of consciousness was a danger sign, and women exposed to the MNH Program interventions were significantly more likely to report severe bleeding as a danger sign.

Women and their husbands in the followup survey also had greater knowledge concerning danger signs in the newborn and basic care of the newborn. Specifically, women and their husbands were significantly more likely to know that difficulty feeding and fever were danger signs in the newborn. In addition, there was a significant increase among women and their husbands in reported knowledge that exclusive breastfeeding is recommended. Women exposed to MNH Program interventions also reported significantly greater knowledge than their unexposed counterparts about cleaning and wrapping the newborn.

Older women at followup exhibited greater knowledge than older women at baseline that "a person in good health can be infected with HIV." Because of the relatively small sample size of this group, however, statistical comparisons between exposed and unexposed persons, and between baseline and followup, were often not possible.

General knowledge/awareness about AIDS also had increased among women and their husbands at followup. Women were significantly more knowledgeable about "transmission in pregnancy or childbirth," about "transmission by breastfeeding," and that "a person in good health can be infected with HIV." Women exposed to the MNH Program interventions also reported significantly greater knowledge than unexposed women that a person in apparent good health can be infected with HIV.

Finally, although the MNH Program is widely identified with various safe motherhood activities in Koupéla, little is known about the White Ribbon Alliance. Overall, fewer than 2 in 100 people had heard of the WRA or learned about it through its activities.

### ***Improved Birth Preparedness***

At followup, respondents in the different survey groups were better able to recognize that it is important to plan ahead for childbirth, and many reported making arrangements accordingly. Sixty-one percent of pregnant women scored at least 3 out of 5 on a composite measure of BP/CR (including ANC visits, plans for a skilled provider at birth, plans for transport and finances, and knowledge of at least two danger signs) in 2004—25 percent higher than in 2001.

The birth plans made by the respondents are encouraging. At followup, pregnant women were significantly more likely to report having made financial arrangements and plans to give birth. In addition, women who had given birth in the previous year showed a significant increase at followup in reporting having made financial arrangements.

### ***Use of Key Safe Motherhood Services***

Perhaps the most important finding of this study was that women who had given birth in the previous year were significantly more likely at followup than at baseline to report having given birth with the assistance of a skilled provider. Specifically, a greater proportion of women gave birth with an auxiliary midwife. Increasing skilled attendance at birth was a major goal of the MNH Program globally—and in Burkina Faso specifically—based on the evidence that skilled attendance contributes overwhelmingly to improving safe motherhood outcomes for mothers and their newborns.

Women's reported use of both antenatal care and postpartum care services has also improved, in terms of both frequency and timing of visits. Among women who had given birth in the previous 12 months, there was a significant increase between baseline and followup in the proportion who had four or more antenatal care visits and those who had their first visit at 3–4 months, with a corresponding significant drop in the proportion who had their first visit later than 4 months into their pregnancy. This is an important finding, because ANC can serve as a gateway to skilled care throughout pregnancy, birth, and the postpartum period. The proportion of women with a birth in the previous 12 months who reported having two postpartum visits within 6 weeks after giving birth increased significantly over the study period, while the proportion having only one visit dropped significantly. The small proportion of women who reported having their first postpartum consultation less than 6 hours after childbirth may partly reflect the difficulty of collecting these data. For instance, women who give birth in a health facility may be unable to distinguish postpartum care from routine care or other care provided by health workers.

The populations surveyed reported higher levels of use of the various malaria prevention measures at followup, and a decrease occurred in the proportion of people who reported not using any prevention strategy. Significantly more pregnant women and women who had recently given birth reported owning ITNs at followup than at baseline. Women who were exposed to the MNH Program and who had an ITN at home were more likely than those not exposed to report having a net that had been treated with insecticide in the past year. Increased ownership of ITNs among women also positively affects the prevention of malaria in newborns, because women who use ITNs during pregnancy are more likely to continue using them with their babies.

Malaria-related findings suggest that populations may be shifting away from chemoprophylaxis to environmental or hygiene measures and use of protective barriers—in particular ITNs—to prevent malaria. The extent to which the populations interviewed have embraced ITNs as a protective measure is indeed remarkable. This revolution in the use of treated nets illustrates the strategic nature of the MNH Program’s malaria prevention efforts. Despite the renewed interest in this barrier method of prevention, environmental management measures remain the main method of malaria prevention for the majority of the population in this study.

Large numbers of women of childbearing age have adopted IPT with SP. This new prophylaxis was being used by four out of five women overall. More than half of the women who had recently given birth had received the recommended three doses of SP.

The majority (75.2%) of the women surveyed received IPT with SP at a healthcare facility. This finding is linked to the fact that health workers often require women to take SP immediately upon their arrival at the health facility, so that women do not forget or refuse to follow the treatment regimen correctly (because they are ignorant of the therapeutic effects of SP or for any other reason). Women who have not eaten before coming to the health facility are generally exempted from this requirement, however, as SP should be taken after a meal.

About 10 percent of women of reproductive age reported having suffered a malaria attack during pregnancy. Of the various malaria drugs prescribed, the most common one was chloroquine (Nivaquine®). However, the followup survey found that prescription of this drug for women of reproductive age had declined significantly since baseline, according to the survey respondents. SP was introduced in 2003 and is rapidly becoming an increasingly important therapeutic alternative for treating malaria. Reasons for the increasing prescription of SP include the increased resistance to chloroquine in this region, as elsewhere, and SP’s proven safety and efficacy during pregnancy.

## **Conclusions**

Overall, the results of this evaluation suggest that critical improvements in safe motherhood knowledge, preparedness, and actions have taken place at the community level in MNH Program-assisted areas in Koupéla, Burkina Faso. The MNH Program successfully reached its target populations and yielded significant improvements in many areas within a relatively short timeframe.

The extent to which the community and those who provide health services have come to feel ownership of the MNH Program’s behavior change initiatives will be answered over time. To date, the successes of these initiatives have shown that achieving safe motherhood is directly linked to the knowledge and willingness of women, families, communities, and providers to change behaviors. Ongoing efforts to broaden behavior change throughout the country and to other countries in the region can generate sustainable change where populations are committed to shared responsibility and collective action.



## APPENDIX: SUPPLEMENTAL TABLES

**Table A-1. Summary of the Survey Plan**

Hierarchical Level	Theoretical Sample Size
<b>Pregnant women</b>	
180 pregnant women/12 health areas ⇒	15 pregnant women per health area
Each health area will be divided into 2 strata ⇒	7 or 8 pregnant women per stratum
2 villages per stratum ⇒	3 or 4 pregnant women per village
<b>Women with a child under the age of 12 months</b>	
180 women who have just had a baby /12 health areas ⇒	15 women who have recently had a baby per health area
Each health area will be divided into 2 strata ⇒	7 or 8 women who have recently had a baby per stratum
2 villages per stratum ⇒	3 or 4 women who have recently had a baby per village
<b>Husbands of pregnant women</b>	
90 husbands/12 health areas ⇒	7 or 8 husbands per health area
Each health area will be divided into 2 strata ⇒	3 or 4 husbands per stratum
2 villages per stratum ⇒	1 or 2 husbands per village
<b>Husbands of women who have recently had a baby</b>	
90 husbands/12 health areas ⇒	7 or 8 husbands per health area
Each health area will be divided into 2 strata ⇒	3 or 4 husbands per stratum
2 villages per stratum ⇒	1 or 2 husbands per village
<b>Older women</b>	
60 older women/12 health areas⇒	5 older women per health area
Each health area will be divided into 2 strata ⇒	2 or 3 older women per stratum
2 villages per stratum ⇒	1 or 2 older women per village
<b>TBAs (<i>accoucheuses villageoises</i> and <i>accoucheuses traditionnelles</i>)</b>	
60 TBAs /12 health areas ⇒	5 TBAs per health area
Each health area will be divided into 2 strata ⇒	2 or 3 TBAs per stratum
2 villages per stratum ⇒	1 or 2 TBAs per village
<b>Opinion leaders</b>	
60 opinion leaders/12 health areas ⇒	5 opinion leaders per health area
Each health area will be divided into 2 strata ⇒	2 or 3 opinion leaders per stratum
<b>Qualitative study of women with a child under the age of 12 months</b>	
30 women with a child under 1 year of age/12 health areas ⇒	2 or 3 women with a child under 1 year of age per health area
2 or 3 women with a child under 1 year of age per health area ⇒	1 or 2 women <30 or •30 years of age per stratum

**Table A-2. Distribution of the Survey Sample, MNH Program Followup Survey, Koupéla District, Burkina Faso, 2004**

Health Area (average distance)	Stratum	PRW	WCH	OLW	Leaders	Men			TBAs			Qualitative Survey (WCH)		
						HPW	HHWC	Men	ACV	ACT	TBAs	< 30 yrs	≥30 yrs	Total
Andemtenga (27.0 km)	Near	8	7	2	1	7		7	2		2	1		
	Far	7	8	3	4		8	8		3	3	1		
	Total	15	15	5	5	7	8	15	2	3	5	2	0	2
Kalwartenga (33.4 km)	Near	8	7	2	3	7		7		2	2	1		
	Far	7	8	3	2		8	8	3		3		1	
	Total	15	15	5	5	7	8	15	3	2	5	1	1	2
Kando (17.7 km)	Near	7	8	3	2	7		7			0		1	
	Far	8	7	2	3		8	8	5		5	1		
	Total	15	15	5	5	7	8	15	5	0	5	1	1	2
Nakalbo (14.8 km)	Near	7	8	1	3	7		7			0	1		
	Far	8	7	4	2		8	8	5		5		1	
	Total	15	15	5	5	7	8	15	5	0	5	1	1	2
Songretenga (37.1 km)	Near	8	7	3	2	8		8		3	3	1		
	Far	7	8	2	3		7	7	2		2		1	
	Total	15	15	5	5	8	7	15	2	3	5	1	1	2
Nohoungo (8.1 km)	Near	7	8	3	1	7		7		2	2		1	
	Far	8	7	2	4		8	8	3		3	1		
	Total	15	15	5	5	7	8	15	3	2	5	1	1	2
Kodemende (34.7 km)	Near	7	7	2	2	8		8		2	2	1		
	Far	8	8	3	3		7	7	3		3		1	
	Total	15	15	5	5	8	7	15	3	2	5	1	1	2
Ligdi-Malguem (23 km)	Near	8	8	2	3	7		7		3	3	1		
	Far	7	7	3	2		8	8	2		2		1	
	Total	15	15	5	5	7	8	15	2	3	5	1	1	2
Badtenga (17.5 km)	Near	8	8	3	2	8		8		2	2	1		
	Far	7	7	2	3		7	7	3		3		1	
	Total	15	15	5	5	8	7	15	3	2	5	1	1	2
Ouenga (30.2 km)	Near	8	7	3	3	8		8		3	3	1		
	Far	7	8	2	2		7	7	2		2		1	
	Total	15	15	5	5	8	7	15	2	3	5	1	1	2
Pouytenga (27.4 km)	Near	7	7	2	3	8		8		3	3	1	1	
	Far	8	8	3	2		7	7	2		2	2	1	
	Total	15	15	5	5	8	7	15	2	3	5	3	2	5
Koupéla (12.8 km)	Near	8	8	3	3	8		8		4	4	3	1	
	Far	7	7	2	2		7	7	1		1		1	
	Total	15	15	5	5	8	7	15	1	4	5	3	2	5
Avg.=22.8km														
<b>TOTAL</b>		<b>180</b>	<b>180</b>	<b>60</b>	<b>60</b>	<b>90</b>	<b>90</b>	<b>180</b>	<b>33</b>	<b>27</b>	<b>60</b>	<b>17</b>	<b>13</b>	<b>30</b>

PRW=pregnant woman; WCH=woman with a child less than 12 months old; OLW=older woman  
 HPW=husband of pregnant woman; HWC=husband of woman with child less than 12 months old  
 TBA=traditional birth attendant; ACV=accoucheuse villageoise; ACT=accoucheuse traditionnelle

**Table A-3. Villages Selected for Mapping**

Department		Health Area		Villages		Stratum
Code	Name	Code	Name	Name	Code	
1	Andemtenga	1	Andemtenga			
				Kombeolé	25	Far
				Kougré	27	Near
				Koundi	81	Far
				Tobaghin	88	Near
		18	Ouenga			
				Doundoudougou	11	Near
				Guefourgou	15	Far
				Tambela	85	Near
				Zimkorome	90	Far
		20	Songretenga			
				Koendé Zeguedmissi	80	Far
				Sabribinatenga	46	Far
				Songretenga	53	Near
				Zorgo	72	Near
				Sabrouko*	47	Far
5	Kando	9	Kando			
				Bagwokin	73	Near
				Guirgo	17	Far
				Kioungo	22	Far
				Soalga III	84	Far
				Soalguin	52	Near
		10	Kodémendé			
				Bissighin	5	Far
				Mobega	34	Near
				Tanghin	86	Far
				Tansega	87	Near
6	Koupéla	2	Baadtenga			
				Bissiga	75	Near
				Bonessin	7	Far
				Dianghin**	76	Far
				Gargaoughin	78	Near
		13	Ligdi-Malguem			
				Gohin	79	Far
				Ligdi-Malguem	33	Near
				Nabekiessim	35	Far
				Naftenga	37	Near
		11	Koupéla			
				Koulbalé	28	Far
				Regdouré	82	Far
				Secteur 3	49	Near

Department		Health Area		Villages		Stratum
Code	Name	Code	Name	Name	Code	
				Toulgou Kanré	89	Near
		14	Nakalbo			
				Kanrin	21	Far
				Nakalbo	38	Near
				Reoghin	44	Near
				Ronsin	83	Far
		16	Nouhoungo			
				Belmin	4	Far
				Bollin	6	Far
				Googhin	14	Near
				Nohoungo	40	Near
				Yarcin	66	Near
7	Pouytenga	8	Kalwartenga			
				Guentenga (Kando)	16	Near
				Lelkom (Pouytenga)	32	Near
				Nabnongzougo (Lando)	36	Far
				Tanga (Lando)	56	Far
		19	Pouytenga			
				Baka-Zaogho	74	Near
				Finougou	77	Far
				Secteur 3	50	Near
				Siguinoghin	51	Far

\* Qualitative survey only

\*\* Quantitative and qualitative surveys

**Table A-4. Distribution of Community Leaders**

Department	Health Area	Stratum	Village	Sex		
				M	F	Total
Andemtenga	Andemtenga	Near	Kougre			0
Andemtenga	Andemtenga	Near	Tobaghin		1	1
Andemtenga	Andemtenga	Far	Koundi	1	1	2
Andemtenga	Andemtenga	Far	Kombeolé	2		2
			<b>Total</b>	<b>3</b>	<b>2</b>	<b>5</b>
Koupéla	Baadtenga	Near	Bissiga	1		1
Koupéla	Baadtenga	Near	Gargaoughin	1		1
Koupéla	Baadtenga	Far	Dianghin		1	1
Koupéla	Baadtenga	Far	Bonessin	2		2
			<b>Total</b>	<b>4</b>	<b>1</b>	<b>5</b>
Kando	Karwartenga	Near	Lelkom	1	1	2
Kando	Karwartenga	Near	Guentenga	1		1
Kando	Karwartenga	Far	Tanga	1		1
Kando	Karwartenga	Far	Nabnongzougo	1		1
			<b>Total</b>	<b>4</b>	<b>1</b>	<b>5</b>
Kando	Kando	Near	Bagwokin	1		1
Kando	Kando	Near	Soalguin	1		1
Kando	Kando	Far	Kiungo	1	1	2
Kando	Kando	Far	Soalga III		1	1
Kando	Kando	Far	Guirgo			0
			<b>Total</b>	<b>3</b>	<b>2</b>	<b>5</b>
Kando	Kodemende	Near	Mobega		1	1
Kando	Kodemende	Near	Tansega	1		1
Kando	Kodemende	Far	Bissighin	2		2
Kando	Kodemende	Far	Tanghin	1		1
			<b>Total</b>	<b>4</b>	<b>1</b>	<b>5</b>
Koupéla	Ligdi-Malguem	Near	Ligdi-Malguem	1		1
Koupéla	Ligdi-Malguem	Near	Naftenga	1		1
Koupéla	Ligdi-Malguem	Far	Nabekiessim		1	1
Koupéla	Ligdi-Malguem	Far	Gohin	1	1	2
			<b>Total</b>	<b>3</b>	<b>2</b>	<b>5</b>
Koupéla	Nakalbo	Near	Nakalbo		1	1
Koupéla	Nakalbo	Near	Reoghin	2		2
Koupéla	Nakalbo	Far	Ronsin		1	1
Koupéla	Nakalbo	Far	Kanrin	1		1
			<b>Total</b>	<b>3</b>	<b>2</b>	<b>5</b>
Koupéla	Nohoungo	Near	Nohoungo	1		1
Koupéla	Nohoungo	Near	Yarcin			0
Koupéla	Nohoungo	Near	Googhin			0
Koupéla	Nohoungo	Far	Belmin	1	1	2
Koupéla	Nohoungo	Far	Bolin	1	1	2
			<b>Total</b>	<b>3</b>	<b>2</b>	<b>5</b>

Department	Health Area	Stratum	Village	Sex		
				M	F	Total
Andemtenga	Ouenga	Near	Tambela	1	1	2
Andemtenga	Ouenga	Near	Doundoudougou	1		1
Andemtenga	Ouenga	Far	Zimkorome	1		1
Andemtenga	Ouenga	Far	Guefourgou		1	1
			<b>Total</b>	<b>3</b>	<b>2</b>	<b>5</b>
Andemtenga	Songretenga	Near	Songretenga		1	1
Andemtenga	Songretenga	Near	Zorgo	1		1
Andemtenga	Songretenga	Far	Sabribinatenga	1		1
Andemtenga	Songretenga	Far	Koende Zeguemissi	1	1	2
			<b>Total</b>	<b>3</b>	<b>2</b>	<b>5</b>
Koupéla	Koupéla	Near	Sect. 3		1	1
Koupéla	Koupéla	Near	Koulbalé	1	1	2
Koupéla	Koupéla	Far	Regdouré		1	1
Koupéla	Koupéla	Far	Toulgou Kanre	1		1
			<b>Total</b>	<b>2</b>	<b>3</b>	<b>5</b>
Pouytenga	Pouytenga	Near	Sect. 3	1	1	2
Pouytenga	Pouytenga	Far	Finougou	1		1
Pouytenga	Pouytenga	Far	Sig-nonghin	1		1
Pouytenga	Pouytenga	Near	Baka-Zaogho		1	1
			<b>Total</b>	<b>3</b>	<b>2</b>	<b>5</b>
<b>TOTAL</b>	<b>12 areas</b>			<b>38</b>	<b>22</b>	<b>60</b>

**Table A-5. Profile of Community Leaders**

Type of Community Leader	Number	%
CBO official (leader)	24	40.0
Eminent person (including village chiefs)	11	18.3
Religious leader	4	6.7
Village administrative official	14	23.3
Municipal council member	1	1.7
Village health management committee (CoGes) member	3	5.0
CoGes leader	3	5.0
<b>TOTAL</b>	<b>60</b>	<b>100.0</b>

**Table A-6. Older Women's and TBAs' Knowledge of Danger Signs during the Postpartum, by Survey**

Postpartum Danger Sign	Older Women								TBAs							
	Baseline (N=60)		Followup						Baseline (N=60)		Followup					
	n	%	Exposed (n=38)		Unexposed (n=22)		Total (N=60)		n	%	Exposed (n=54)		Unexposed (n=6)		Total (N=60)	
			n	%	n	%	n	%			n	%	n	%		
Severe bleeding immediately following childbirth	33	55.0	17	44.7	9	40.9	26	43.3	49	81.7	46	85.2	5	83.3	51	85.0
Loss of consciousness following childbirth	24	40.0	4	10.5	0	0.0	4	6.7	27	45.0	17	31.5	1	16.7	18	30.0
Swelling of hands	2	3.3	3	7.9	0	0.0	3	5.0	2	3.3	5	9.3	0	0.0	5	8.3
Visual disturbances/seizure	10	16.7	9	23.7	0	0.0	9	15.0	15	25.0	18	33.3	1	16.7	19	31.7
Fever	7	11.7	14	36.8	8	36.4	22	36.7	10	16.7	17	31.5	0	0.0	17	28.3
Headaches	5	8.3	12	31.6	4	18.2	16	26.7	6	10.0	12	22.2	0	0.0	12	20.0
Vomiting	6	10.0	10	26.3	3	13.6	13	21.7	6	10.0	7	13.0	2	33.3	9	15.0
Don't know	11	18.3	0	0.0	2	9.1	2	3.3	0	0.0	0	0.0	1	16.7	1	1.7

**Table A-7. Community Leaders' Knowledge of Danger Signs in the Postpartum Period, by Survey**

Postpartum Danger Sign	Community Leaders						
	Baseline	Followup					
	n	Exposed (n=32)		Unexposed (n=28)		Total (N=60)	
		n	%	n	%	n	%
Severe bleeding immediately following childbirth	NA	21	65.6	12	42.9	33	55.0
Loss of consciousness following childbirth	NA	3	9.4	3	10.7	6	10.0
Swelling of hands	NA	2	6.3	1	3.6	3	5.0
Visual disturbances/seizure	NA	5	15.6	4	14.3	9	15.0
Fever	NA	9	28.1	3	10.7	12	20.0
Headaches	NA	6	18.8	3	10.7	9	15.0
Vomiting	NA	4	12.5	4	14.3	8	13.3
Don't know	NA	2	6.3	2	7.1	4	6.7

**Table A-8. Older Women's and TBAs' Knowledge of Elements of Basic Newborn Care, by Survey**

Basic Newborn Care Measure	Older Women								TBAs							
	Baseline (N=60)		Followup						Baseline (N=60)		Followup					
	n	%	Exposed (n=38)		Unexposed (n=22)		Total (N=60)		n	%	Exposed (n=54)		Unexposed (n=6)		Total (N=60)	
			n	%	n	%	n	%			n	%	n	%		
Exclusive breastfeeding	11	18.3	17	44.7	7	31.8	24	40.0	9	15.0	22	40.7	2	33.3	24	40.0
Cleaning and wrapping	57	95.0	33	86.8	21	95.5	54	90.0	57	95.0	51	94.4	6	100.0	57	95.0
Eye care	12	20.0	16	42.1	3	13.6	19	31.7	19	31.7	20	37.0	1	16.7	21	35.0
Cord care	45	75.0	28	73.7	13	59.1	41	68.3	57	95.0	46	85.2	5	83.3	51	85.0
Don't know	1	1.7	0	0.0	0	0.0	0	0.0	1	1.7	0	0.0	0	0.0	0	0.0

**Table A-9. Malaria Protection Methods Used by Women of Childbearing Age and Their Husbands, by Survey**

Malaria Protection Method	Pregnant Women/Women Who Had Recently Given Birth								Husbands							
	Baseline (N=360)		Followup						Baseline (N=180)		Followup					
	n	%	Exposed (n=247)		Unexposed (n=113)		Total (N=360)		n	%	Exposed (n=126)		Unexposed (n=54)		Total (N=180)	
			n	%	n	%	n	%			n	%	n	%		
Does not do anything	91	25.3	22	8.9	23	20.4	45	12.5	36	20.0	15	11.9	15	27.8	30	16.7
Eliminate all stagnant water/brush	73	20.3	84	34.0	24	21.2	108	30.0	39	21.7	50	39.7	19	35.2	69	38.3
Insect repellent	19	5.3	28	11.3	7	6.2	35	9.7	24	13.3	24	19.0	5	9.3	29	16.1
Drugs for malaria prevention	191	53.1	126	51.0	41	36.3	167	46.4	59	32.8	21	16.7	7	13.0	28	15.6
Protective clothing	34	9.4	29	11.7	11	9.7	40	11.1	20	11.1	22	17.5	3	5.6	25	13.9
Mosquito net	43	11.9	34	13.8	15	13.3	49	13.6	47	26.1	28	22.2	11	20.4	39	21.7
Treated mosquito net	3	0.8	91	36.8	25	22.1	116	32.2	21	11.7	57	45.2	11	20.4	68	37.8*
Does not know any method of malaria prevention	5	1.4	3	1.2	1	0.9	4	1.1	25	13.9	0	0.0	0	0.0	0	0.0

\* $p < .05$

**Table A-10. Malaria Protection Methods Used by Older Women and TBAs, by Survey**

Malaria Protection Method	Older Women								TBAs							
	Baseline (N=60)		Followup						Baseline (N=60)		Followup					
	n	%	Exposed (n=38)		Unexposed (n=22)		Total (N=60)		n	%	Exposed (n=54)		Unexposed (n=6)		Total (N=60)	
			n	%	n	%	N	%			n	%	n	%	n	%
Does not do anything	38	63.3	6	15.8	12	54.5	18	30*	13	21.7	8	14.8	3	50.0	11	18.3
Eliminate all stagnant water/brush	6	10.0	14	36.8	4	18.2	18	30	35	58.3	31	57.4	2	33.3	33	55.0
Insect repellent	0	0.0	8	21.1	1	4.5	9	15	10	16.7	4	7.4	1	16.7	5	8.3
Drugs for malaria prevention	11	18.3	3	7.9	1	4.5	4	6.7	17	28.3	11	20.4	1	16.7	12	20.0
Protective clothing	7	11.7	8	21.1	3	13.6	11	18.3	8	13.3	11	20.4	0	0.0	11	18.3
Mosquito net	1	1.7	6	15.8	1	4.5	7	11.7	6	10.0	12	22.2	0	0.0	12	20.0
Treated mosquito net	0	0.0	8	21.1	1	4.5	9	15	2	3.3	21	38.9	1	16.7	22	36.7
Does not know any method of malaria prevention	0	0.0	1	2.6	1	4.5	2	3.3	7	11.7	8	14.8	0	0.0	8	13.3

\*p<.05

**Table A-11. Women's Choice of Persons (Other than Their Husbands) to Talk to about Their Pregnancy, by Survey**

Category of Persons	Pregnant Women								Women Who Had Recently Given Birth							
	Baseline (N=20)		Followup						Baseline (N=20)		Followup					
	n	%	Exposed (n=17)		Unexposed (n=7)		Total (N=24)		n	%	Exposed (n=16)		Unexposed (n=15)		Total (N=31)	
			n	%	n	%	n	%			n	%	n	%		
Health worker	2	10.0	0	0.0	0	0.0	0	0.0	2	10.0	2	12.5	3	20.0	5	16.1
Sister	0	0.0	1	5.9	0	0.0	1	4.2	1	5.0	0	0.0	0	0.0	0	0.0
Sister-in-law	1	5.0	5	29.4	0	0.0	5	20.8	4	20.0	0	0.0	1	6.7	1	3.2
Mother-in-law	8	40.0	6	35.3	2	28.6	8	33.3	7	35.0	7	43.8	9	60.0	16	51.6
Older woman	3	15.0	4	23.5	2	28.6	6	25.0	4	20.0	5	31.3	3	20.0	8	25.8
TBA	2	10.0	0	0.0	3	42.9	3	12.5	4	20.0	4	25.0	1	6.7	5	16.1



