



**Maternal and Child Health in Timor-Leste:
Final Knowledge, Practice and Coverage Survey Report**

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**HEALTH ALLIANCE INTERNATIONAL
4534 11th Ave NE
Seattle Washington 98105 USA
and
PO Box 225
Dili, East Timor**

Report prepared by:

**Marisa Harrison
Mary Anne Mercer**

Acknowledgements

The following people contributed time, energy, and expertise without which this report could not have been produced:

Interviewers

Teresa C. Alves
Botavio Joaquim Alves
Teresinha A. Batista
Pedro Almeida da Costa
Sonia Nadio Fernandes
Teresinha da Costa Lopes
Paulo Pereira Martins
Filomena Mendonca
Helena Gastao Pereira
Nani Ronalda
Zeanaida Espirito Santos
Paulino Salsinha
Salvador Torrezaio Ornai
Maria da Costa Xavier

Survey Supervisors

Jose Fatima da Cruz
Madeline Frey
Marisa Harrison
Jennifer Hulme
Antonia Mesquita
Ricardo Santos
Teresinha Sarmento
Paul Vasconcelos
Paulina Viegas
Eduardo Ximenes

Survey Coordinator/Trainer

Jennifer Hulme

Timor-Leste Directorate of Statistics technical support

Silvinho Lopes
Cesar Melitos dos Martins

Questionnaire development and analysis

Marisa Harrison

HAI Technical support

Nadine Hoekman
Susan Thompson
Mary Anne Mercer

ABBREVIATIONS USED

ANC	Antenatal Care
CS	Child Survival
DHS	Demographic and Health Surveys
DOS	Directorate of Statistics
HAI	Health Alliance International
HMIS	Health Management Information System
IMCI	Integrated Management of Childhood Illness
KPC	Knowledge, Practices and Coverage
MCH	Maternal and Child Health
MCHWG	Maternal and Child Health Working Group
MNC	Maternal and Newborn Care
MOH	Ministry of Health
NGO	Nongovernmental Organization
PSF	Promotor Saude Familiar (Family Health Promoter)
Rapid CATCH	Core Assessment Tool on Child Health
TAIS	Timor-Leste Assistencia Integrada Saude (a project of BASICS3)
TBA	Traditional Birth Attendant
TT	Tetanus toxoid

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1 INTRODUCTION

1.1 Background

Country and project background:

Timor-Leste became an independent nation in May 2002. Massive post-referendum violence in 1999 had left the country with the task of rebuilding, with limited resources, an entire infrastructure including the health care system. The health problems of Timorese, particularly women and infants, are great. In 2003 maternal mortality was estimated to be 650-800/100,000 live births and infant mortality 60/1000 live births. An estimated 109 children/1000 died before reaching age five. Use of antenatal care, skilled health providers at delivery, and postpartum and newborn care were all very low, and fertility in 2003 was the highest recorded globally. Even today a large proportion of women are non-literate, and an estimated 40% of families live under conditions of extreme poverty on less than \$0.55 per day – a number that reaches nearly 50% in rural areas. Much of the population is rural, where nearly half of the families live more than an hour's walk from a health facility. Traditional beliefs and practices around childbearing and child rearing are strong.

Health Alliance International's four-year child survival program was funded in 2004 to assist the newly developing Timor-Leste Ministry of Health (MOH) to develop and implement a comprehensive approach to maternal and newborn care. After the first two years of intensive pilot efforts in four focus districts (Ermera, Liquica, Aileu, and Manatuto), the project expanded to an additional two districts (Manufahi and Ainaro). Additional selected activities in Dili District benefitted from the project but were not addressed in this survey. The six target districts for this survey include approximately 66,500 women of childbearing age and 18,000 infants born to them annually.

Project goals and objective:

The goal of the project is to improve health and reduce mortality and morbidity for mothers and their infants in Timor-Leste. Key objectives are:

Health system objectives:

1. 90% of MOH health facilities in the program districts will have at least one staff member skilled in the key elements of antenatal care (ANC) and in communications skills for maternal and newborn services
2. 90% of MOH health facilities in the program districts will have at least one staff member skilled in the key elements of essential postpartum/newborn care including resuscitation skills
3. 90% of MOH health facilities in the program districts will have available and accessible the essential supplies and equipment for antenatal and safe delivery care
4. 90% of MOH health facilities in the program districts will have available and accessible the essential supplies and equipment for postpartum/newborn care

Family and community objectives:

5. Antenatal care utilization in program districts (one or more visits) will increase from an estimated 45% to 70%
6. Tetanus toxoid immunization during the last pregnancy (two or more injections) will increase from 48% to 70%
7. Deliveries by a skilled birth attendant in program districts will increase from 16% to 30%
8. The proportion of women who have given birth in the past year who have had high-dose Vitamin A supplementation within 8 weeks of the delivery will increase from 28% to 60%
9. The proportion of infants ages 0-5 months who are exclusively breastfed will increase from 29% to 45%
10. 50% of mothers of a child ages 0-23 months will know the danger signs of newborn illness

Strategies and activities

The HAI program aimed to accomplish these objectives by: 1) supporting the MOH to improve the quality of and access to antenatal and postnatal/newborn care services, and 2) increasing appropriate home care and care-seeking practices for maternal and newborn care (MNC) by mothers and other community members. HAI has worked closely with national-level MOH staff as well as district staff and other partners to promote the development of sound maternal and newborn care policies and assist with their implementation in target districts. HAI staff promoted the development of an MOH district program health officer for MCH; supported skills-based training and supportive supervision of MOH midwives; participated actively in the Maternal and Child Health Working Group (MCHWG), which is advisory to the MOH; developed training and health promotion materials for MOH staff and volunteers; and served as one of the MOH's primary source of technical support for MNC.

Project staff gathered qualitative baseline information to fill in current gaps regarding knowledge, beliefs, and practices related to reproduction, pregnancy, childbirth, the postpartum period, newborn care, breastfeeding, and the use of health services. A number of mass media communication approaches and materials have been developed and disseminated to promote key messages, including theater and community theater; posters and photo health education cards; "The Women's War", a two-part film on MNC, using scenes from traditional rural life; and radio messages.

Partnership with MOH

HAI conducted this survey with support from the Ministry of Health and in close collaboration with the Directorate of Statistics (DOS) in Timor in all steps of the process. For cluster selection, the DOS assisted by providing population sizes for enumeration areas, as well as lists of the residents and the GPS coordinates for their households for each enumeration area selected, obtained from the previous census. DOS staff provided detailed maps of the survey districts, highlighting selected enumeration areas, households of the selected individuals, and locations of health facilities. DOS staff also designed the survey's data entry system in CS Pro 3.3. Interviewers and supervisors were selected from a list of trained professionals that the DOS often hires for surveying, and rooms in their building were used for training and data entry. Working with the Directorate of Statistics allowed HAI to both have access to trained interviewers and to strengthen its relationship with the government of Timor-Leste. The type of random sampling and household selection methodology used was new for them, and their involvement increased their future capacity to conduct small-sample surveys.

The survey was approved by the Timor-Leste MOH ethics review process and the University of Washington Human Subjects Institutional Review Board.

The results of the survey will be disseminated widely within the MOH, and will contribute to their systems for tracking progress in the national maternal care program. Lessons learned about conducting a survey locally will be shared with HAI's other local partners, including TAIS, CCT, and The Alola Foundation.

1.2 Survey objectives

This survey sought to cover a wide range of MCH indicators. The objectives include to provide:

- Data for the final evaluation for the CS grant, including information at both the initial 4-district and final 6-district levels
- Midterm data related to HAI's child spacing grant
- MCH data on all 6 current districts to serve as a baseline for future programs and to inform MOH efforts in the rural central region

2 METHODS

2.1 Questionnaire development and survey approval

The questionnaire was developed using as an outline USAID's KPC 2000+ Rapid Catch Survey, available at <http://www.childsurvival.com/tools/surveys.cfm> and adding questions taken from the DHS questionnaire and other standardized surveys. Additional questions on media and on practices surrounding birth were developed by project staff. The survey's 82 questions cover antenatal care (including birth plans and tetanus toxoid immunization), birthing practices (including skilled birth attendance and immediate breastfeeding), postnatal care, family planning and contraceptive use, childhood immunization and illnesses, and exposure to media messages about a family planning. The survey questionnaire was developed by Marisa Harrison and field tested extensively by Jennifer Hulme and HAI staff in Timor-Leste prior to and during the course of the survey training. Both the English and Tetun version of the questionnaire are included in **Appendices B and C** of this report. Further translation into local languages of Galolen, Mambae, and Tetun Terik was done by interviewers at the time of the interview, as needed.

2.2 Sampling design

This survey used a cluster sampling method, with samples drawn at three levels: district (the primary sampling unit), *suco* or village level, and enumeration areas that have been previously defined based on a recent census. The first two were selected according to population size, and the last was an approximation of population size. Because this survey was intended to provide follow-up information for the four initial districts, 30 clusters of 7 households were selected within the original four districts. Overall population of the original four districts was 232,678 and the total population of the six districts is 330,104. Thirteen additional clusters were drawn from Manufahi and Ainaro, based on population size of these districts, to provide a full sample of 43 clusters for the six districts of the project. See **Appendix A** for population numbers.

Once the enumeration areas were selected, a house number was drawn randomly from a list of households enumerated in the census. The *aldeia* (neighborhood) nearest to that house was used as a starting point, and if the *aldeia* contained more than 200 households the sub-area within the *aldeia* nearest to the randomly selected household was chosen. This was done by plotting the GPS location on a map of the area and measuring to the nearest *aldeia*. If the household was not close to any defined *aldeia*, the District Administrators and/or *Chefe de Suco* were consulted to determine the closest population center.

The three reasons occasionally needed for choosing an alternate cluster for the survey were: there was no *aldeia* near the selected household, the *aldeia* was more than 1 hour walk from the road (which only occurred twice), and the originally selected *aldeia* did not contain enough participants. When the latter occurred, the survey team continued with the next nearest *aldeia*. When a problem occurred, the District Administrator, a *Chefe de Suco*, or *Chefe de Aldeia* were consulted to identify the nearest populations.

After the *aldeia* (or *sub-aldeia*) was identified, the starting household was determined by the spin-the-bottle method. Supervisors would identify the center of the community—the area where there were roughly equal number of houses in all directions as identified by the *Chefe de Aldeia*—and spin a water bottle, with the two ends of the bottle indicating the directions for team pairs to follow. Each pair, consisting of a supervisor and interviewer or two interviewers, would follow as straight a line as possible from the bottle site until they reached the edge of the *aldeia*. As they walked, they would number the houses within ~15 feet from their path. When they got to the edge, they would use a currency note to

identify the initial house and return to that house for the start of the surveying process. Additional houses were identified as the nearest visible door from the doorway of the initial house. Teams conducted 3 or 4 interviews as agreed upon prior to spinning the bottle, then returned to a central meeting area to review the questionnaires when finished.

2.3 Selection process and consent

Women were included in the survey if they were between the ages of 15-49 and had a child who was under 24 months old. If two women fit that description within one household, we interviewed the mother of the youngest child. If a woman meeting the selection criteria was absent from the house, we would determine if she would return within 30 minutes or whether we could return in the afternoon to interview her. If she would be unavailable at these times, we would move on to another household. Sixteen eligible women were excluded from the survey because they were not at home and not expected to return home.

Women were approached with an explanation of the survey and asked if they would participate (see consent form in questionnaire documents). It was made clear that they could refuse to participate, but refusals were rare. Most refusals occurred in coffee-growing areas, as it was coffee harvest time, as well as in one district that had experienced recent civil unrest. Fifteen women refused to participate out of a total of 332 approached.

2.4 Interviewer training

Interviewers were selected from a list of staff available through the Directorate of Statistics (DOS) Timor-Leste. Almost all had previous experience doing quantitative surveys in the field, although most had not covered health topics. Additional interviewers came from HAI office staff, all of whom had assisted in field testing the questionnaire and were familiar with the health topics. Team supervisors came from the HAI office staff as well as from the Directorate of Statistics. Because there were more female team members than male, every interview was conducted by a team containing at least one woman.

Training took place over 5 days in June, with two days of supervisor training and an additional three days that included supervisors and interviewers. The training was conducted by Jennifer Hulme and Paul Vasconcelos, HAI staff, and covered good interviewing skills, random sampling, confidentiality and consent, and detailed review of the survey questionnaire. Time was given to practice the survey, including a half day field test.

2.5 Data collection

Data were collected between June 23rd and July 2nd by 6 teams that included 1-3 supervisors and 2-3 interviewers. The teams stayed in the districts while conducting the survey; the majority of the interviews took place in the morning and early afternoon. On average, it took 33 minutes to complete an interview.

Supervisors were given a checklist for monitoring the interviews, filled out daily with feedback to the interviewer. Supervisors also would list any problems or notable events for each cluster. They were in contact via text message or phone call with one of the survey coordinators daily (when they had cell phone coverage) to report on any problems encountered or receive updates.

Problems with the data collection process were relatively few. There was slight confusion, clarified after the first day, over the vitamin A supplementation question for women since the samples shown to illustrate the vitamin were yellow and the type being distributed was often red.

2.6 Data analysis and interpretation

Data entry was conducted by three assistants suggested by the DOS. Entry was done with CS Pro 3.3, with the system designed by a staff member of the DOS. Data were compiled at the end of each day and all daily files were exported into Excel and checked for common coding mistakes. Because CS Pro does not allow for double entry, files were randomly examined to ensure correct individual data. Data cleaning was done in Excel before entry into Stata 10.0 IC for analysis.

The six districts from which the data were drawn (Ermera, Liquica, Aileu, Manatuto, Manufahi and Ainaro) plus rural Dili and Atauro Island were included under the “Rural Central” region during the 2003 DHS. Data using only mothers of children under age 2 from the first four districts listed above in the rural central region, HAI’s startup districts, provided baseline data for the HAI objectives.

Confidence limits

Confidence limits signify the range between which the true value or percentage the results could fall. A 95% confidence interval means that if this study were repeated 100 times, for 95 of those studies, the resulting value would fall within the two numbers given. A narrow confidence interval indicates that the data were more tightly clustered. Conversely, with a larger interval between the lower and upper bounds of the confidence limits, the less certain we can be of our estimate. This can also occur when there are fewer data in the sample, such as when looking at sub-samples of the women or children (e.g. children under 1 year of age).

P-values

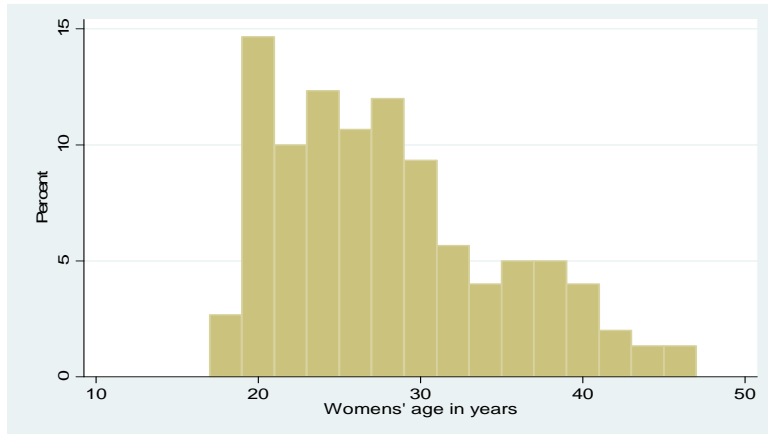
P-value is the probability that the results found could have been due to chance. The lower the number, the less likely the association is random and the more likely that there is a true relationship between the factors being compared. The results are considered “significant”, or a true association, if the P-value falls below 0.01. In this report, P-values were used to compare different subgroups within the current population (e.g. women of different age groups, women from different wealth index levels, etc.). The P-values were obtained using chi-squared tests.

3 DEMOGRAPHIC CHARACTERISTICS

3.1 Women’s characteristics

A total of 301 women were interviewed for this survey, 210 in the initial 4 districts and 91 in the two expansion districts. The average age of the participants was 27.8 years, with most falling between the ages of 20 and 39 (see **Figure 3.1**). All were between the ages of 15 and 49.

Figure 3.1 Age distribution of participants
Distribution of women’s ages in 2-year increments



All but three of the women were married and the average number of children per woman was 4.5. Approximately 57% of women had some formal schooling and 41% percent had finished primary school or beyond. Eleven percent of respondents had completed secondary school or higher. See **Table 3.1** for a summary of demographic characteristics for the whole survey sample.

To analyze the effects of household wealth on our objectives, we used a simple 5-point scale based on presence of cement flooring and metal roofing material, and possession of a toilet, electricity, and a radio. Those with a total score of 0-1 were put in the “lowest” category, those with 2-3 in the “middle” category, and scores of 4-5 were considered the “richest” category. About 21% of women ended up in each of the “lowest” and “richest” categories, and the remaining approximately 58% of participants were defined as “middle” wealth status (see **Table 3.1**). This simple index proved to be very useful as a basis for comparison in key indicators.

Table 3.1 Demographic characteristics of survey population
Distribution of demographic characteristics

	Number of women	Percent
Age group		
15-19	23	7.6
20-24	96	31.9
25-29	78	25.9
30-34	47	15.6
35-39	31	10.3
40-44	21	7.0
45-49	5	1.7
Average age	27.8 (95% CI: 26.7, 28.9)	
Number of children born to woman		
1	65	21.6
2-3	75	24.9
4-5	62	20.6
6-7	43	14.3
8-9	33	11.0
10+	23	7.6
Average number of children	4.5 (95% CI: 4.1, 4.9)	
Educational level		
Never attended	129	42.9
Some primary	49	16.3
Completed primary	24	8.0
Some middle school	25	8.3
Completed middle school	23	7.6
Some secondary	17	5.7
Completed secondary or higher	34	11.3
Household wealth index		
Lowest	64	21.3
Middle	173	57.4
Richest	64	21.3
Total	301	100.0

3.2 Housing characteristics

The housing characteristics used for calculating the wealth index are seen in **Table 3.2**. Most participants had metal roofing (72.8%), most had earthen floors (73.4%), and most did not have electricity (74.8%). The most common location of a toilet was outside the house, and almost 20% of respondents had no toilet at all. Radios were found in 41% of homes.

Table 3.2 Housing characteristics**Percentage of respondents who had natural or manmade roofing or floor materials, electricity, toilet, and radio**

	Number	Percent
Roofing material		
Natural materials	80	26.6
Iron/Zinc	219	72.8
Other	2	0.7
Flooring material		
Earth	221	73.4
Concrete	78	25.9
Wood or Bamboo	1	0.3
Other	1	0.3
Electricity in house		
Yes	76	25.3
No	225	74.8
Location of toilet		
Inside the house	2	0.7
Outside the house	240	79.7
Have no toilet	59	19.6
Possession of radio		
Yes	124	41.2
No	174	58.5
Missing	1	0.3
Total	301	100.0

4 ANTENATAL CARE

4.1 Antenatal care coverage

Women were asked if they saw a skilled health professional (doctor, nurse, or midwife) for care during their last pregnancy, and if so, whom they saw. Women were encouraged to list all individuals that they consulted. In the six districts 84.1% of women reported visiting a health professional for antenatal care at least once (95% CI: 77.2%, 90.9), and 55.8% of women reported attending four or more ANC visits (95% CI: 46.8%, 64.8%). There is a trend towards greater use of ANC for women who are younger [P=0.028], and appears to increase as educational level increases [P<0.001] and as household wealth index increases [P=0.003] (see **Table 4.1**).

Table 4.1 Antenatal care

Percent distribution of all women receiving one or more antenatal care visits (ANC1) and four or more ANC visits (ANC4) according to age, parity, education level, and wealth index

Background Characteristics	One or more ANC visits		Four or more ANC visits	
	Percent	Confidence Limits	Percent	Confidence Limits
Age group				
15-19	87.0	(66.4, 95.8)	47.8	(28.2, 68.2)
20-34	86.9	(78.1, 92.5)	57.9	(48.4, 66.9)
35-49	71.9	(56.1, 83.7)	50.9	(35.2, 66.4)
Number of children				
1	92.3	(80.2, 97.3)	61.5	(46.9, 74.3)
2-3	84.0	(67.3, 93.1)	53.3	(39.1, 67.0)
4-5	87.1	(74.6, 94.0)	62.9	(46.5, 76.8)
6+	76.8	(65.6, 85.1)	49.5	(37.9, 61.2)
Educational level				
Never attended	72.9	(60.4, 82.5)	41.9	(31.3, 53.2)
Some primary	89.8	(74.8, 96.3)	63.3	(45.1, 78.3)
Completed primary	95.8	(75.3, 99.4)	75.0	(53.7, 88.6)
Some middle school or higher	92.9	(85.7, 96.7)	65.7	(54.3, 75.5)
Household wealth index				
Poorest	71.9	(56.1, 83.6)	28.1	(17.6, 41.7)
Middle	84.4	(75.6, 90.4)	59.0	(49.2, 68.1)
Richest	95.3	(84.7, 98.7)	75.0	(64.3, 83.3)
Total	84.1	(76.0, 89.8)	55.8	(46.8, 64.8)

Of the 253 women in this survey who reported being seen by a health professional for ANC, 43 reported seeing more than one type of health provider. **Table 4.2** indicates which providers were seen according to the most qualified professional. Twelve percent of women reported seeing a doctor for one or more of their ANC visits. While 70.4% of women report receiving ANC from a midwife overall, for only 63.5% of women was a midwife the most highly skilled professional seen.

Trends in utilization of different skilled professionals indicate that women with higher levels of education and a higher score on household wealth index have higher utilization of doctors for ANC than do other groups. It is unclear if the higher percentages in those groups are due to educational attainment or the greater availability of education near health centers. Similarly, it is unclear whether the richest women, according to our index, have more money and thus seek out doctors or if they have utilities such as electricity because they live nearer to a town where there would also be health facilities.

Table 4.2 Percent distribution of ANC providers by background characteristics
Percent distribution of all women receiving one or more antenatal care visits
by care provider and by age, parity, education level, and wealth index

Background Characteristics	Doctor	Midwife	Nurse	TBA	No one	Total women
Age group						
15-19	8.7	73.9	4.4	0.0	13.0	23
20-34	14.0	62.0	10.9	0.9	12.2	221
35-49	5.3	64.9	1.8	3.5	24.6	57
Birth order						
1	15.4	64.6	12.3	1.5	6.2	65
2-3	14.7	57.3	12.0	1.3	14.7	75
4-5	8.1	74.2	4.8	0.0	12.9	62
6+	10.1	60.6	6.1	2.0	21.2	99
Educational level						
Never attended	7.0	58.1	7.8	0.8	26.4	129
Some primary	14.3	63.3	12.2	4.1	6.1	49
Completed primary	16.7	70.8	8.3	0.0	4.1	24
Some middle school or higher	16.2	68.7	8.1	1.0	6.1	99
Household wealth index						
Poorest	9.4	51.6	10.9	0.0	28.1	64
Middle	6.4	68.8	9.3	2.3	13.3	173
Richest	29.7	60.9	4.7	0.0	4.7	64
Total	12.0	63.5	8.6	1.3	14.6	301

4.2 Number of antenatal care visits and timing of first visit

Of those who received at least one ANC visit, the average number of visits was 4.5. A large percentage (43.1%) of women initiated ANC during their first trimester (see **Table 4.3**). Higher household wealth index and higher educational level were associated with earlier initiation of ANC and women with low household wealth index and lower educational levels had later initiation times.

Table 4.3 Number of antenatal care visits and timing of first visit
Percent distribution of women who received ANC by number of ANC visits
and by time of initiation of ANC visits

Number and timing of ANC visits	Number of women	Percent	Confidence Limits
Received antenatal care			
Yes	253	84.1	(75.6, 89.8)
No	48	15.9	(10.2, 24.1)
Number of times received ANC			
1 time	12	4.0	(1.8, 8.5)
2 times	39	13.0	(9.0, 18.3)
3 times	34	11.3	(7.7, 16.3)
4 or more times	168	55.8	(46.7, 64.5)
Did not receive ANC	48	15.9	(10.2, 24.1)
Total	301	100.0	
Number of months pregnant when initiated ANC			
1-3 months	109	43.1	(*)
4-5 months	77	30.4	(*)
6-9 months	67	26.5	(*)
Total	253	100.0	

4.3 Tetanus toxoid coverage

Tetanus toxoid (TT) receipt during pregnancy was determined by the recall of the interviewee. We found that, during their most recent pregnancy, 79.7 percent of women received at least one TT (95% CI: 71.9%, 87.6%), and approximately sixty-nine percent of respondents reported receiving two or more TT. While it is policy to provide TT twice during pregnancy, many women reported receiving three or more injections during their pregnancy (21.3%).

Approximately 81% of women (80.7%, 95% CI: 73.1, 88.3) reported 2 or more TT during their lifetime (see Table 4.4). Over 40% of respondents reported receiving five or more TT injections over their lifetime prior to the birth of their youngest child. The percent of women who reported receiving 5 or more TT over their lifetime rises to 50.4% (95% CI: 40.6, 60.3) when women who have had only one child are excluded from the calculation. Forty one participants, or 13.6%, reported never receiving a TT injection over their lifetime.

Table 4.4 Tetanus toxoid coverage

Percent distribution of women receiving tetanus toxoid (TT) injections during most recent pregnancy and over lifetime

Background Characteristics	During most recent pregnancy				Lifetime TT				Never	Total
	0	1	2	3+	1	2	3-4	5+		
Age group										
15-19	13.0	17.4	47.8	21.7	17.4	43.5	13.0	13.0	13.0	23
20-34	18.1	8.6	51.1	22.2	5.0	19.0	24.4	40.3	11.3	221
35-49	31.6	17.5	33.3	17.5	3.5	10.5	12.3	50.9	22.8	57
Birth order										
1	12.3	7.7	56.9	23.1	9.2	50.8	26.2	3.1	10.8	65
2-3	20.0	6.7	46.8	22.7	1.3	13.3	42.7	29.3	13.3	75
4-5	14.5	16.1	46.8	22.6	11.3	8.1	12.9	61.3	6.5	62
6+	29.3	13.1	39.4	21.3	3.3	10.1	7.1	59.6	20.2	99
Educational level										
Never attended	31.0	10.1	39.5	19.4	5.4	19.4	20.2	31.8	23.3	129
Some primary	16.3	16.3	51.0	16.3	8.2	20.4	10.2	46.9	14.3	49
Completed primary	4.2	8.3	70.8	16.7	0.0	8.3	16.7	75.0	0.0	24
Some middle school or higher	12.1	10.1	50.5	27.3	6.1	21.2	29.3	39.4	4.0	99
Household wealth index										
Poorest	35.9	6.3	43.8	14.1	7.8	21.9	12.5	29.7	28.1	64
Middle	19.7	12.1	46.2	22.0	4.6	19.7	24.3	38.7	12.7	173
Richest	6.3	12.5	54.7	26.6	6.3	15.6	21.9	54.7	1.6	64
Total	20.3	11.0	47.5	21.3	5.7	19.3	21.3	40.2	13.6	301

5 DELIVERY AND POSTPARTUM CARE

5.1 Place of delivery

Home deliveries are much more common (77.7% of all births) in these districts than were facility births (22.3%). While women with first births have a higher average number of facility births than the overall average, the youngest age group has a much lower average of facility births. This suggests that women between the ages of 15-19 may not know the benefits of facility births or face additional barriers to access. Women attaining middle school or higher also had a higher percentage of facility births, as did women from the richest household wealth index.

Table 5.1 shows a strong trend in facility births for those with the highest numbers of antenatal care visits. All women in this study who had not attended ANC or had received only one ANC visit delivered at home. Of those women who received 4 or more ANC visits, two-thirds of the women gave birth in a facility. This may be an issue of access—women who live closer to health facilities are more likely to visit those facilities for antenatal care and are also more likely to be able to go to the facility to give birth. The maternal educational level [P<0.001] and wealth index [P<0.001] were also a strongly associated with women having facility births.

Table 5.1 Place of delivery
Percent of women having a home or facility delivery by background characteristics

Background Characteristics	Health Facility	Home	Total births
Mother's age			
15-19	13.0	87.0	23
20-34	24.0	76.0	221
35-49	19.3	80.7	57
Birth Order			
1	38.5	61.5	65
2-3	17.3	82.7	75
4-5	21.0	79.0	62
6+	16.2	83.8	99
Maternal Education			
Never attended	13.2	86.8	129
Some primary	10.2	89.8	49
Completed primary	20.8	79.2	24
Some middle school or higher	40.4	59.6	99
Antenatal Care			
None	0.0	100.0	48
1	0.0	100.0	12
2-3	15.1	84.9	73
4+	66.7	33.3	168
Household wealth index			
Poorest	7.8	92.2	64
Middle	19.1	80.9	173
Richest	45.3	54.7	64
Total Number	67	234	301
Total Percent	22.3	77.7	100.0

5.2 Attendance during delivery

Skilled birth attendants (SBA) are defined in this survey as a doctor, nurse, or midwife, and exclude “dukuns” or traditional birth attendants (TBAs). To determine levels of SBA utilization, mothers were asked to list all persons present at the birth of their youngest child. SBAs were reported to have assisted at 31.9% of births (95% CI: 21.5, 42.3). **Table 5.2** includes all persons reported to be present at all births, while **Table 5.3** presents attendance based on the most qualified attendant. Midwives are the most common trained birth attendants in Timor-Leste and were present at approximately 30% of births. In this analysis, midwives were considered more qualified than nurses to assist in birth considering their more extensive training in the subject. Doctors, who receive more training, assisted with 3.3% of births. Family or friends were the sole attendant at 48.4% of births, but were present at 73% of births overall. Traditional birth attendants were used in about 16% of births.

Table 5.2 Total attendance at birth

Percent of all births attended by skilled professionals, TBAs, friends or family

Assisted by	Number	Percent	Confidence Limits
Health professional			
Doctor	10	3.3	(1.4, 5.2)
Nurse	9	3.0	(0.5, 5.4)
Midwife	90	29.9	(19.9, 39.9)
Traditional birth attendant (“dukun”)	49	16.3	(10.8, 21.8)
Family health promoter (PSF)	5	1.7	(0.0, 3.4)
Relative or friend	221	73.4	(65.2, 81.7)
No one	7	2.3	(0.7, 4.0)
Total	393*		

* Numbers do not add up to 301 because multiple answers were possible

The association between age and use of a skilled birth attendant is not consistent, with the middle age group of 20-34 most likely to utilize an SBA (Table 5.3). Women’s parity, education level, and wealth index appear to influence SBA use. As the number of children increases, the use of trained attendants decreases. Better educated women and those from wealthier homes are more likely to use an SBA.

Table 5.3 Use of SBA by background characteristics

Percent of skilled and unskilled attendance at birth by most qualified person

Background Characteristics	Skilled birth attendants				Untrained attendants				No one
	Doctor**	Midwife	Nurse	Total trained	TBA	PSF	Relative or friend	Total untrained	
Age group									
15-19	0	26.1	0	26.1	8.7	0	65.2	73.9	0
20-34	4.1	27.2	2.3	33.5	17.2	1.4	46.2	64.7	1.8
35-49	1.8	24.6	1.8	28.1	14.0	0	52.6	66.7	5.3
Birth order									
1	9.2	30.8	3.1	43.1	18.5	0	38.5	56.9	0
2-3	2.7	25.3	2.7	30.7	20.0	1.3	45.3	66.7	2.6
4-5	1.6	30.7	1.6	33.9	9.7	0	54.8	64.5	1.6
6+	1.0	22.2	1.0	24.2	15.2	2.0	54.6	71.7	4.0
Educational level									
Never attended	1.6	14.0	1.6	17.1	13.2	0.8	65.1	79.1	3.9
Some primary	2.0	22.5	4.1	28.6	20.4	0	49.0	69.4	2.0
Completed primary	0	33.3	0	33.3	20.8	8.3	37.5	66.7	0
Some middle school or higher	7.1	43.4	2.0	52.5	16.2	0	30.3	46.5	1.0
Household wealth index									
Poorest	0.0	10.9	0.0	10.9	14.1	3.1	67.2	84.4	4.7
Middle	1.7	26.0	1.2	28.9	16.2	0.6	52.0	68.8	2.3
Richest	10.9	43.8	6.3	60.9	17.2	0.0	21.9	39.1	0.0
Total	3.3	26.6	2.0	31.9	16.0	1.0	48.8	65.8	2.3

**If a doctor was present, they were considered the highest ranking skilled attendance, then midwife, then nurse.

5.3 Cord cutting practices

Assuming that all skilled birth attendants properly sanitized their cord cutting instruments, we asked all women not attended by a skilled professional what type of instrument they had used to cut their child’s umbilical cord and how they had cleaned the instrument prior to use. The best method of sanitizing the cord-cutting instrument was to boil it in water for 5 minutes. In this analysis, using a new razor was also considered adequate. **Table 5.4** shows the results: 23.9% of births without an SBA used appropriately cleaned instruments, almost all of which were new razor blades. Very few women boiled their instruments, and a few tried to use alcohol. None reported the use of fire to sanitize the instrument. “Other” techniques, reported by 20% of women, included washing the instrument with water only or wiping the instrument with cotton, clothe or gauze. Thirty percent of women did nothing to clean the instrument.

Table 5.4 Cord cutting techniques
Percent of women using appropriately cleaned instruments for cutting the umbilical cord

Instrument used to cut the cord	Clean method**	Unsanitary techniques			Total
		Did nothing	Used alcohol	Other	
Skilled attendant cut the cord	100.0	--	--	--	96
Unskilled attendant used new razor blade	100.0	--	--	--	45
Other Instruments					
Old razor blade	0.0	73.7	0.0	26.3	19
Knife or scissors	3.4	54.2	3.4	39.0	118
Bamboo	0.0	60.0	0.0	40.0	20
Other	0.0	33.3	0.0	66.7	3
Total	48.2	30.2	1.3	20.3	301

**Clean methods include using a new razor blade, boiling the instrument for 5 or more minutes, or the cord was cut by a SBA.

5.4 Postpartum care

In order to verify that women had received full post partum care (PPC), we asked women who claimed to have had PPC whether or not they had received a physical exam. Our analysis includes only those women who verified they had received a physical exam at their PPC. In our sample districts, 15.3% of women had received PPC within 3 days of giving birth (95% CI: 9.5, 23.7), 29.6% had received PPC by the end of the first week (95% CI: 21.5, 37.7), and 47.8% had been examined within one month of delivery (95% CI: 39.2, 56.5). **Table 5.5** illustrates the timing of the first PPC check according by age group, parity, mother’s educational level, and the household wealth index. The number of women who received no PPC at all increases somewhat with the age of the mother and her parity. The strongest associations are with education and wealth levels. As educational level increases, substantially more women get PPC and have it sooner after delivery. Women from wealthier households are more than four times as likely obtain early PPC than those from the poorest households. Conversely, women who never attended school or who are from the poorest strata are twice as likely as the best educated or wealthiest women to have no PPC at all.

5.5 Postpartum care by background characteristics

Percent of women receiving a physical postpartum exam and the timing of first exam by background characteristics

Background Characteristics	Timing of first postpartum check				Did not receive PPC	Number of women
	Within 3 days of delivery	4-7 days of delivery	8-28 days of delivery	28-56 days of delivery		
Age group						
15-19	17.4	13.0	21.7	0.0	47.8	23
20-34	14.9	15.4	19.0	3.2	47.5	221
35-49	15.8	10.5	17.5	1.8	54.4	57
Birth order						
1	20.0	18.5	20.0	0.0	41.5	65
2-3	12.0	25.3	12.0	4.0	46.7	75
4-5	19.4	9.7	24.2	1.6	45.2	62
6+	12.1	6.1	20.2	4.0	57.6	99
Educational level						
Never attended	7.0	10.9	17.1	3.1	62.0	129
Some primary	10.2	10.2	26.5	4.1	49.0	49
Completed primary	16.7	8.3	16.7	8.3	50.0	24
Some middle school or higher	28.3	22.2	18.2	0.0	31.3	99
Household wealth index						
Poorest	7.8	14.1	12.3	3.1	62.5	64
Middle	11.0	13.3	22.0	3.5	50.3	173
Richest	34.4	17.2	17.2	0.0	31.3	64
Total	15.3	14.3	18.9	2.7	48.8	301

5.5 Vitamin A

Vitamin A uptake was assessed by mother's recall. Women were shown sample capsules of Vitamin A (a capsule that is squirted into the mouth) and asked whether they had received a similar capsule within two months of giving birth. Forty-four percent of women reported receiving the capsule (95% CI: 35.2, 52.8). **Table 5.6** shows the association between receipt of PPC and receipt of Vitamin A capsules. Women who received no antenatal care were the least likely to have postpartum care: 83.3% received neither a physical exam nor Vitamin A. There is an apparent discrepancy between women claiming to have received Vitamin A and women who received a physical exam within 1 month of delivery. On average, 38.7% of women received neither service, 30.7% received one or the other, and 30.7% received both a post-partum physical exam and Vitamin A capsule. Those 30.7% of women who receive one or the other are being seen by the medical system within 2 months of delivery, perhaps to check on the health of their child, but they are not receiving the complete recommended care for themselves.

Table 5.6 Vitamin A and post partum check by background characteristics
Percent distribution who received Vitamin A within 2 months of delivery and/or a physical exam within 1 month post delivery

Background Characteristics	Neither	Received Vit A, no PPC	Received PPC, no Vit A	Received both	Number of births*
Mother's age					
15-19	43.5	4.3	17.4	34.8	23
20-34	35.9	15.0	17.3	31.8	220
35-49	47.4	10.5	17.5	24.6	57
Birth Order					
1	29.7	10.9	21.9	37.5	64
2-3	37.3	13.3	16.0	33.3	75
4-5	32.3	14.5	17.7	35.5	62
6+	49.5	14.14	15.2	21.2	99
Maternal Education					
Never attended	51.9	13.2	14.0	20.9	129
Some primary	36.7	16.3	16.3	30.6	49
Completed primary	41.7	20.8	8.3	29.2	24
Some middle school or higher	21.4	10.2	24.5	43.9	98
Antenatal Care					
None	83.3	4.2	4.2	8.3	48
1	58.3	25.0	16.7	0.0	12
2-3	32.8	15.1	23.3	28.8	73
4+	27.0	14.4	18.6	40.1	167
Household wealth index					
Poorest	50.0	17.2	7.8	25.0	64
Middle	42.4	11.6	17.4	28.5	172
Richest	17.2	14.1	26.6	42.2	64
Total Percent	38.7	13.3	17.3	30.7	300*

*Missing data on Vitamin A uptake for one woman

6 BREASTFEEDING AND CHILDHOOD NUTRITION

6.1 Initiation of breastfeeding

A high percentage of respondents reported initiating breastfeeding within one hour of delivery: 72.8% (95% CI: 66.6, 78.1). Almost all women reported breastfeeding within the first day: 93.3% (95% CI: 89.1, 96.0). Time of initiation did not vary much between the sex of the child, by educational level, or by household wealth index. Of women who had given birth with a traditional birth attendant, however, fewer reported starting breastfeeding within the first hour (see **Table 6.1**). Women who had given birth with TBAs also reported the highest percentage of pre-lacteal feeding—giving the child liquids or semisolid foods before providing breastmilk/colostrum. Over one-third of women report giving their child pre-lacteal feeds: 50% of women attended by a TBA gave plain water, sugar water, or formula to their infant before breastfeeding. Prelacteal feeding after SBA or facility delivery was half that for TBAs or home births.

Table 6.1 Initiation of breastfeeding by background characteristics
Percentage of women who initiated breastfeeding within one hour or one day
with or without pre-lacteal feeds by background characteristics

Background Characteristics	Percentage who started breastfeeding		Percentage receiving prelacteal liquid*	Number of children breastfed
	Within 1 hour	Within 1 day		
Sex of child				
Male	73.6	93.1	36.8	174
Female	71.7	93.7	38.6	127
Educational level				
Never attended	75.2	93.8	40.3	129
Some primary	67.4	93.9	44.9	49
Completed primary	70.8	91.7	37.5	24
Some middle school or higher	72.7	92.9	30.3	99
Household wealth index				
Poorest	71.9	92.2	37.5	64
Middle	74.0	93.6	35.8	173
Richest	70.3	93.7	42.2	64
Assistance at delivery				
Health professional	78.1	96.8	24.0	96
Traditional birth attendant	64.6	91.7	50.0	48
Friend, family member, PSF	71.3	92.0	42.7	150
No one	85.7	85.7	28.6	7
Place of delivery				
Health facility	79.0	98.4	19.4	62
Home	72.2	91.9	41.5	234
Birth friendly facility	20.0	93.3	8.0	5
Total	72.8	93.3	37.5	301

*Reported prelacteal foods include water, sugar water, and formula.

6.2 Exclusive and complementary feeding

Two-thirds of women (66.7%) with children under 5 months provided only breastmilk to their infants in the previous 24 hours (95% CI: 56.6, 77.4). Female children were less likely to be exclusively breastfed: 60.4% of girls (95% CI: 46.6%, 74.4%) and 72.9% of boys (95% CI: 58.0, 87.9) received only breastmilk. **Table 6.2** shows that almost 90% of women exclusive breastfeed their infants for the first two months after birth and then some slowly add water-based and milk-based complementary foods. After 2-3 months of birth, mothers begin to introduce solid and semi-solid foods and by nine months, over 80% are complementary feeding: 84.4% of infants between 6-9 months received both breastmilk and a solid or semi-solid food in the previous 24 hours (95% CI: 73.0%, 95.8%). Of the 45 infants in this age group for which we had data, 7 did not receive either breastmilk or food, and 2 did not receive breastmilk. The remaining 5 had consumed only breastmilk in the previous 24 hours, and were between the ages of 7-9 months.

Table 6.2 Breastfeeding status by child's age
Percent of children under the age of 9 months being fed breastmilk and other foods

Age in months	Breastfeeding and consuming:						Total children per age group
	Not breast-feeding	Exclusively breastfed	Plain water	Water based liquids or juice	Other milk	Comple-mentary foods	
<2	0.0	0.0	0.0	3.6	7.2	0.0	22
2-3	5.1	5.1	5.1	5.2	2.6	15.4	
4-5	33.3	33.3	4.2	0.0	8.3	54.2	
6-7	8.7	4.4	0.0	0.0	0.0	87.0	
8-9	0.0	18.2	0.0	0.0	0.0	81.8	
Total number	2	66	3	3	5	57	
Total percent	1.5	48.5	2.2	2.2	3.7	41.9	100.0

**Categories were defined in a similar way to the DHS groupings. Each of the six groups are mutually exclusive: not breastfeeding at all, exclusively breastfeeding, breastmilk plus plain water, breastmilk plus other water-based liquids or juice, breastmilk plus other milk products, and breastmilk plus complimentary solid or semi-solid foods.

6.3 Weight-for-age status of children

We did not take weight measurements for the children included in this survey. Instead, we looked at the last recorded weight on the growth chart included in the *lisio*. If the weight recorded was on or under the red line on the *lisio*, which represents the lowest 5th percentile, they were considered underweight for age. This technique was employed by the MOH for reporting on childhood malnutrition for the 2007 Health Statistics Report¹. Of the 181 children with *lisios*, 147 had recently recorded weights on their growth chart. About 13% percent of these children were found to be underweight (12.9%, 95% CI: 7.3%, 18.5%). Twenty percent of female children were underweight (20.3%, 95% CI: 9.8, 30.8) and 6.4% of male children were underweight (95% CI: 0.9, 11.9).

7 CONTRACEPTION AND BIRTH SPACING

7.1 Birth spacing

We found that 67.7% of children born on our program districts were born at least 24 months after their most recent living sibling (95% CI: 62.1%, 73.2%).

As **Table 7.1** illustrates, the number of months since previous birth tends to be somewhat shorter for the younger women and somewhat higher for the oldest age group. The most recent DHS suggested that there was a difference between the spacing of children according to mother's age. Our data supports this: for every 5 years of age, there is an average of 2.0 additional months between the ages of a woman's previous two births (95% CI: 0.8, 3.1, P-value=0.002).

¹ MOH, Annual Health Statistics Report 2007

The DHS report also suggested that women with no education and those with less than completion of primary schooling had increased spacing between their children. We found that those who had completed primary schooling or above had on average 3.2 fewer months between their children than those with less schooling, although the difference was of borderline significance (95% CI: -6.7, 0.2, P-value=0.065).

Table 7.1 Child spacing background characteristics
Mother's characteristics and number of months between previous two live births

Background Characteristics	Number of months since previous birth					Average difference in age (# months)
	<18	18-23	24-35	36-47	48+	
Mother's age						
15-19	0.0	50.0	25.0	0.0	25.0	32.0
20-34	14.0	19.3	43.9	13.5	9.4	29.5
35-49	14.0	14.0	38.6	15.8	17.5	32.6
Maternal Education						
Never attended	13.3	19.1	40.0	15.2	12.4	30.9
Some primary	7.5	20.0	35.0	22.5	15.0	33.1
Completed primary	28.6	9.5	57.1	0.0	4.8	24.7
Some middle school or higher	13.6	19.7	45.5	10.6	10.6	29.4
Household wealth index						
Poorest	17.0	21.3	42.6	12.8	6.4	26.9
Middle	12.6	18.5	41.5	14.1	13.3	31.2
Richest	14.0	16.0	44.0	14.0	12.0	31.2
Total percent	13.8	18.5	42.2	13.8	11.6	30.3

7.2 Current pregnancy and desire for more children

Out of 301 mothers of children under 2 year of age, 28 women, or 9.3% (95% CI: .6.2%, 13.7%), were currently pregnant. Desire for another pregnancy did not vary significantly between maternal age group, number of living children, or maternal educational level (see **Table 7.2**). There was a clear difference, however, for different household wealth levels, with women from the wealthier households more likely than those less wealthy to state that they did not want another pregnancy soon. Among women of the lowest wealth index level who were not already pregnant, 54.4% said they did not desire another pregnancy soon (95% CI: 37.5, 70.1) and 15.6% said they were unsure (95% CI: 8.9, 29.8). Seventy-six percent of women of the middle index level said they did not desire another pregnancy soon (95% CI: 66.0, 84.5) and only 5.2% were unsure (95% CI: 2.4, 13.5). And of women of the highest wealth index level, 82.0% said they would not like another pregnancy in the near future (95% CI: 63.8, 80.4). Only 4.7% of this group was unsure (95% CI: 4.8, 13.3).

Table 7.2 Fertility preferences by background information

Percent distribution of women who are currently pregnant or not pregnant and desire another child in the near future

Background Characteristics	Currently pregnant	Not pregnant and desire another child soon			Number of women
		Yes	No	Unsure	
Mother's age					
15-19	13.0	17.4	60.9	8.7	23
20-34	7.7	20.4	65.2	6.8	221
35-49	14.0	5.3	71.9	8.8	57
Number of living children					
1	8.5	21.1	62.0	8.5	71
2-3	7.2	24.1	67.5	1.2	83
4-5	10.9	12.5	68.8	7.8	64
6-7	12.0	12.0	62.0	14.0	50
8+	9.1	9.1	72.7	9.1	33
Maternal Education					
Never attended	9.3	19.4	61.2	10.1	129
Some primary	8.2	18.4	69.4	4.1	49
Completed primary	12.5	8.3	79.2	0.0	24
Some middle school or higher	9.1	16.2	67.7	7.1	99
Household wealth index					
Poorest	7.8	26.6	50.0	15.6	64
Middle	11.6	15.6	67.6	5.2	173
Richest	4.7	12.5	78.1	4.7	64
Total	9.3	17.3	66.1	7.3	301

7.6 Knowledge of contraception

The most widely recognized forms of contraception include: injectables (68.1%), lactational amenorrhea, or LAM, (50.5%), and the birth control pill (44.2%). Knowledge of female sterilization, IUD, implants and the condom was reported by about a quarter of the participants, and fewer than 20% of women reported knowledge of male sterilization or the Standard Days methods (see **Table 7.3**). Recognition of one or more contraceptive methods varied by age, maternal educational level, and household wealth index. How these factors impact recognition vary on some of the contraceptive methods. Younger women had higher recognition levels of LAM, rhythm, and withdrawal, but lower recognition levels of hormonal contraceptives. Women of the highest household wealth index had the highest levels of recognition of every method of contraception except for the “other” category, which included mostly “traditional” methods.

The number of recognized contraceptive methods also varied by age, maternal educational level, and household wealth index. As the educational level increases, the number of recognized contraceptive methods increases [P<0.001], and the same is true for household wealth index [P<0.001].

Table 7.3 Knowledge of contraceptive methods

Percent of women who recognized specific contraceptive methods by background characteristics

Background characteristics	Report recognizing any method	Percent recognition of contraceptive methods											Number of women	
		Female Sterilization	Male Sterilization	Injectables	Pill	IUD	Implants	Condom	LAM	Rhythm	Standard Days	Withdrawal		Other*
Mother's age														
15-19	69.6	21.7	17.4	39.1	47.8	17.4	13.0	21.7	60.9	34.8	26.1	30.4	0.0	23
20-34	81.9	28.5	14.0	68.8	43.4	29.9	27.6	29.9	50.2	27.2	19.5	23.5	13.6	221
35-49	94.7	22.8	15.8	77.2	45.6	26.3	31.6	29.8	47.4	24.6	14.0	15.8	28.1	57
Maternal Education														
Never attended	74.4	20.9	11.6	62.8	41.9	23.3	20.9	14.0	41.9	17.1	12.4	15.5	17.1	129
Some primary	81.6	24.5	12.2	63.3	40.8	30.6	24.5	22.5	46.9	20.4	18.4	20.4	18.4	49
Completed primary	95.8	29.2	16.7	83.3	41.7	29.2	33.3	41.7	54.2	33.3	20.8	25.0	12.5	24
Some middle school or higher	92.9	35.4	19.2	73.7	49.5	33.3	35.4	49.5	62.6	42.4	27.3	32.3	12.1	99
Household wealth index														
Poorest	73.4	15.6	10.9	51.6	31.3	18.8	15.6	14.1	37.5	14.1	12.5	18.8	17.2	64
Middle	82.7	21.4	12.7	68.8	43.4	24.9	24.9	24.9	48.6	22.5	15.6	19.7	16.2	173
Richest	95.3	53.1	23.4	82.8	59.4	46.9	45.3	56.3	68.8	53.1	34.4	34.4	10.9	64
Total recognition	83.4	26.9	17.3	68.1	44.2	28.2	27.2	29.2	50.5	27.2	18.9	22.6	15.3	301

* The category of "other" includes non-hormonal, non-barrier methods of contraception, often "traditional" methods.

Table 7.4 Number of recognized contraceptive methods: background characteristics
Number of contraceptive methods recognized by participants by age, educational level and household wealth index

Background Characteristic	Percent of women who recognize one or more methods of contraception			Do not recognize any methods	Total women
	1 method	2-3 methods	4 or more methods		
Mother's age					
15-19	21.7	8.7	39.1	30.4	23
20-34	15.4	23.5	42.1	19.0	221
35-49	22.8	28.1	36.8	12.3	57
Maternal Education					
Never attended	12.2	27.9	30.2	28.7	129
Some primary	22.5	18.4	36.7	22.5	49
Completed primary	16.7	37.5	41.7	4.2	24
Some middle school or higher	20.2	16.2	56.6	7.1	99
Household wealth index					
Poorest	20.3	25.0	23.4	31.3	64
Middle	17.9	25.4	37.6	19.1	173
Richest	12.5	15.6	67.2	4.7	64
Total	17.3	23.3	40.9	18.6	301

Reported knowledge of where to obtain family planning methods was lower than recognition of the methods themselves. Seventy-three percent of women reported knowing at least one source of family planning methods (95% CI: 64.6, 80.2), and the remaining twenty-seven percent had no knowledge of where to go (see **Table 7.5**). Knowledge varied by household wealth index [P=0.003] and maternal education [P=0.049] but not by mother's age [P=0.196]. The most commonly reported sources included: community health center (29.9%), government health post (19.9%), and hospital (19.6%). Fewer women reported other mobile clinics, and no women reported shops or pharmacies (see **Table 7.6**). The 2003 DHS found similarly low levels of knowledge of private sector sources of family planning methods.

Table 7.5 Knowledge of sources of family planning: background characteristics
Knowledge of sources of family planning methods by background characteristics and use of contraception

Background Characteristic	Percent knowing where to find family planning methods		Total women
	Yes	No	
Mother's age			
15-19	56.5	43.5	23
20-34	75.1	24.9	221
35-49	71.9	28.1	57
Maternal Education			
Never attended	65.1	34.9	129
Some primary	71.4	28.6	49
Completed primary	83.3	16.7	24
Some middle school or higher	81.8	18.2	99
Household wealth index			
Poorest	57.8	42.2	64
Middle	72.3	27.7	173
Richest	90.6	9.4	64
Use of contraception*			
Ever used	86.0	14.1	121
Never used	64.4	35.6	180
Current use*			
Currently using	90.1	9.9	71
Not currently using	67.8	32.2	230
Total	73.1	26.9	301

* includes all contraceptive methods except for "other" or traditional methods

Table 7.6 Participants knowledge of specific sources of family planning

Percent knowing specific sources of family planning, of women who know of at least one source of family planning method, by background characteristics and current use of contraceptive method

Background Characteristics	Public medical sources				Private medical sources		Purchased at pharmacy	Other source	Total women
	Community health center	Health post	Mobile clinic	Public hospital	CCT clinic	Other private medical			
Mother's age									
15-19	30.8	46.2	15.4	30.8	0.0	0.0	0.0	7.7	13
20-34	43.4	22.3	10.3	25.9	4.2	3.0	0.0	7.8	166
35-49	34.2	41.5	12.2	29.3	0.0	4.9	4.9	4.9	41
Maternal Education									
Never attended	35.7	31.0	10.7	26.2	3.6	3.6	0.0	9.5	84
Some primary	31.4	28.6	14.3	25.7	0.0	2.9	2.9	0.0	35
Completed primary	50.0	35.0	5.0	15.0	10.0	10.0	5.0	0.0	20
Some middle school or higher	48.2	21.0	11.1	30.9	2.5	1.2	0.0	9.9	81
Household wealth index									
Poorest	29.7	32.4	10.8	35.1	2.7	0.0	0.0	2.7	37
Middle	42.4	30.4	13.6	18.4	4.0	4.8	0.8	6.4	125
Richest	44.8	17.2	5.1	39.7	1.7	1.7	1.7	12.1	58
Current use*									
Currently using	43.8	26.6	15.6	26.6	3.1	1.6	0.0	7.8	64
Not currently using	39.7	27.6	9.0	26.9	3.2	3.9	1.3	7.1	156
Total	40.9	27.3	10.9	26.8	3.2	3.2	0.9	7.3	220

7.7 Current and ever-use of contraception

Out of 301 respondents, 40.2% reported ever using a method of contraception (95% CI: 31.9, 49.1). This includes a mix of hormonal (injection and pill), barrier (IUD, condom), behavioral (LAM, rhythm, withdrawal) and traditional methods. Ever use of methods is associated with household index level ($P=0.009$), but not age or educational level. Of those who have ever used contraception, 57.9% are currently using a method, 6.6% are pregnant, and the remaining 35.5% are not currently using a method. **Table 7.7** shows the distribution of women who are using one or more methods currently, have used them in the past and or have never used any methods. Current use is highest in women who have 2-5 children, have attended at least primary school, and are among the highest wealth group. The highest percentages of women who have never used contraception are in the youngest age group, those who have never attended school, are in the lowest wealth index, and have only one child.

Table 7.7 Ever-use and current-use of contraception: background characteristics
Percent distribution of contraceptive use by select background characteristics

Background Characteristics	Women who have ever-used contraception			Never used contraception*	Total women
	Current users	Current non-users	Currently pregnant		
Mother's age					
15-19	8.7	21.7	4.4	65.2	23
20-34	26.2	13.1	2.3	58.4	221
35-49	33.3	14.0	3.5	49.1	57
Maternal Education					
Never attended	20.2	13.2	3.1	63.4	129
Some primary	38.8	6.1	4.1	51.0	49
Completed primary	29.2	12.5	0.0	58.3	24
Some middle school or higher	27.3	19.2	2.0	51.5	99
Household wealth index					
Poorest	17.2	7.8	3.1	71.9	64
Middle	23.7	15.6	2.9	57.8	173
Richest	42.2	15.6	1.6	40.6	64
Number of living children					
1	10.8	16.9	1.5	70.8	65
2-3	29.3	8.0	1.3	61.3	75
4-5	35.5	16.1	1.6	46.8	62
6+	28.3	15.2	5.1	51.5	99
Total	26.3	14.0	2.7	57.1	301

* Includes 20 pregnant women

Twenty-six percent of all women, or 28.9% of women who are not pregnant, are currently using some form of contraception (95% CI: 22.0, 37.0) (see **Table 7.8**). This does not vary significantly by maternal educational level ($P=0.114$). There may also be a relationship between contraceptive use and age group ($P=0.092$) and household wealth index ($P=0.064$), but neither was found to be significant in this study.

The type of contraceptive method used does not seem to vary significantly across groups. Fewer young women use hormonal injections, and the lower wealth index groups have a higher utilization of withdrawal and traditional methods. Use of LAM appears to increase with age and with household wealth, although neither difference is significant.

Table 7.8 Current-use of contraception**Percent current contraceptive method use by non-pregnant women by background characteristics**

Background Characteristics	Report using any method	Method currently used							Not currently using	Number of women
		Injectables	Pill	IUD	LAM	Rhythm	Withdrawal	Traditional		
Mother's age										
15-19	10.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	90.0	20
20-34	28.4	15.7	2.0	1.0	2.9	1.5	4.4	1.0	71.6	204
35-49	38.8	16.3	4.1	2.0	6.1	0.0	0.0	10.2	61.2	273
Maternal Education										
Never attended	22.2	11.1	1.7	0.9	2.6	0.0	1.7	4.3	77.8	117
Some primary	42.2	20.0	6.7	2.2	2.2	0.0	6.7	4.4	57.8	45
Completed primary	33.3	9.5	4.8	0.0	4.8	9.5	4.8	0.0	66.7	21
Some middle school or higher	30.0	18.9	1.1	1.1	4.4	1.1	3.3	0.0	70.0	90
Household wealth index										
Poorest	18.6	8.5	3.4	0.0	0.0	0.0	3.4	3.4	81.4	59
Middle	26.8	14.4	2.6	0.7	3.9	0.7	1.3	3.3	73.2	153
Richest	44.3	23.0	1.6	3.3	4.9	3.3	8.2	0.0	55.7	61
Total women	28.9	15.0	2.6	1.1	3.3	1.1	3.3	2.6	71.1	273

* Note that if more than one method is used, most effective method is considered in these tabulations

**This table does not include female or male sterilization, implants, condoms, or the standard days method because none of these methods were mentioned to be currently used

7.8 Sources of information on contraception and discussion with individuals

More than one third of all women reported discussing the topics of family planning or child spacing with another person in the last 12 months. Eleven percent of women reported being visited in their homes by a community health worker, volunteer, or health provider to discuss one of the two subjects (95% CI: 6.4-15.5), and 37.5% of woman said they had discussed the topics with someone, whether they were friend, relative, health professional at the clinic or an educator or professional visiting them in their homes (95% CI: 29.7, 45.3). Women in the youngest age groups were least like to speak to anyone: 78.3% of women between the ages of 15-19 reported not speaking to anyone about family planning in the past 12 months (see **Table 7.10**). As household wealth index increases, the percentage of women who report conversations about family planning appear to increase as well [P = 0.002].

Table 7.9 Discussions about family planning

Percent of women reporting a discussion with anyone on family planning in the past 12 months

Background Characteristics	Discussed family planning with*:			Total number of women	
	No one	Health professional or health educator	Husband/partner		Neighbor or other
Mother's age					
15-19	78.3	4.4	4.4	13.0	23
20-34	60.2	25.3	8.1	14.5	221
35-49	64.9	17.5	10.5	14.0	57
Maternal Education					
Never attended	71.3	16.3	9.3	10.9	129
Some primary	69.4	16.3	10.2	6.1	49
Completed primary	41.7	45.8	16.7	12.5	24
Some middle school or higher	52.5	27.3	4.0	23.2	99
Household wealth index					
Poorest	76.6	14.1	4.7	7.8	64
Middle	64.2	20.8	10.4	11.0	173
Richest	43.8	34.4	6.3	29.7	64
Total	62.5	22.3	8.3	14.3	301

*These categories are not mutually exclusive—percentages reported are percentage of all women who report discussion family planning with each individual.

8 CHILDHOOD IMMUNIZATIONS AND ILLNESSES

8.1 Immunization coverage

History of the five vaccine-preventable childhood immunizations (3 DPT, 3 Polio, and 1 measles) was determined by viewing and recording information from the *lisio*, an antenatal and postnatal care booklet that a woman is given at her first antenatal visit. If the *lisio* was not present, no attempt was made to determine the immunization records for a child beyond the receipt of a measles vaccine.

Out of 301 households, only 181 had available *lisios*, of which only 74 were for children over 1 year of age. In households having the *lisio*, 65.0% of children over the age of 1 year had received all their immunizations (95% CI: 53.8, 76.2). All of the children who had complete coverage also had record of receiving of the vaccine for BCG. Oral reporting of measles vaccination was 75.7% (95% CI: 66.7, 84.8).

The most recent Annual Health Statistics Report (MOH, 2007) reported that 34% of children under 5 in Timor-Leste possessed *lisios*. We found that 60% of respondents had their *lisios* in the home, higher than the national estimate, perhaps because this survey covered a younger age group (under 2 years versus under 5 years). Common responses for why the *lisio* was absent included that it was being held at the clinic and that it was collected after all immunizations were provided. Of the 181 *lisios* seen, 23 were suspected of having incomplete vaccination records based on receipt of a later vaccination but not a primary immunization in a series, or receipt of either DPT or polio but not the other when both are usually provided at the same time.

Table 8.1 Vaccinations by background characteristicsPercent of children aged 12-23 months who had *lisio* present who received all required immunizations

Background Characteristics	Number of children with <i>lisio</i> present	(Percent of children with <i>lisio</i> present)	Number reporting received all vaccinations	(Percent of children with <i>lisio</i> present who received all vaccinations)	Total children aged 12-23 months
Sex					
Male	44	53.0	32	66.7	83
Female	30	56.6	20	62.5	53
Birth Order					
1	19	79.2	10	52.6	24
2-3	18	62.1	16	88.9	29
4-5	16	48.5	12	66.7	33
6+	21	42.0	14	56.0	50
Maternal Education					
Never attended	24	39.3	14	50.0	61
Some primary	13	61.9	12	92.3	21
Completed primary	9	81.8	8	88.9	11
Some middle school or higher	28	65.1	18	60.0	43
Household wealth index					
Poorest	11	44.0	7	63.6	24
Middle	49	56.3	32	59.3	87
Richest	14	58.3	13	86.7	24
Total	74	54.4	52	65.0	136

8.2 Recognized symptoms of serious newborn illness

Only 2% of all women could correctly cite three or more signs of newborn illness warranting a visit to a health facility (95% CI: 0%, 3.9%). Although the target was not met, 88% of mothers of children under one year of age identified at least one serious sign, and 16% recognized two or more signs. The most commonly reported signs of newborn illness warranting medical treatment were fever, frequent vomiting, fast/difficult breathing, and poor feeding (see **Table 8.2**).

Table 8.2 Recognized of signs of serious newborn illness

Percent of mothers of children under 1 year of age identifying signs serious newborn illness that warrant taking a child to the clinic

Signs of serious illness	Number mothers reported	Percent of women who reported sign	Confidence Intervals
Fever	138	83.6	(75.2, 89.6)
Fast/difficult breathing	6	3.6	(1.7, 7.8)
Poor feeding	8	4.9	(2.3, 10.0)
Blood in stool	1	0.1	(0.0, 4.4)
Convulsions	1	0.1	(0.0, 4.4)
Frequent vomiting	17	10.3	(6.6, 15.9)
Jaundice	0	0.0	--
Redness around the cord	1	0.1	(0.0, 4.4)
Red/discharging eye	3	1.8	(0.6, 5.6)

8.3 Reported childhood illness and care during illness

Over half of the women interviewed, 168 women (55.8%), reported their child to have been sick in the previous two weeks. We were not able to determine the specifics of each illness. Instead we asked if the child was given more or less liquids and foods during their illness than they would have normally consumed. The majority of children received less liquids and less food than normal (see **Table 8.4**).

Table 8.4 Feeding practices during childhood illness
Amount of food and fluids given to children reported to be sick in previous two weeks

Feeding Practices	Percent
Amount of fluids offered	
Less than usual	54.2
Same amount	41.7
More than usual	4.2
Total	100.0
Amount of food offered	
Less than usual	67.3
Same amount	30.4
More than usual	1.2
Missing data	1.2
Total	100.0

8.4 Malaria prevention

Use of a bed-net was common among households surveyed—60.5% of women reported their use for young children (95% CI: 49.6%, 71.3%). The majority of bed-nets (90.1%) were procured at a health center, and the remaining were purchased.

8.5 Hand-washing practices

Women were asked to report whether they had soap and to list, by recall, all the times they washed their hands with soap. The “ideal” times for hand-washing are before food preparation, before feeding children, after defecation, and after attending to a child who has defecated. Due to the way the question was asked, the actual times of hand-washing may be underestimated if women are not able to remember all the different times they washed their hands, or overestimated if they were trying to tell the interviewer what they wanted to hear. Eighty-four percent of women reported having soap in the household for hand-washing (95%CI: 79%, 90%), 40.1% reported using the soap at one or more of the above times, 20.9% at 2 or more times, and 8.0% at 3 or more times. Of those women who reported having soap, 63.0% reported washing their hands prior to food preparation, 24.8% reported washing their hands prior to feeding their children, 22.8% after defecation, and 15.4% after attending to a child who has defecated. The other responses given were usually “while bathing” and “after working”.

9 KNOWLEDGE OF HIV

9.1 Knowledge of HIV/AIDS

Only one-third (33.5%) of the women interviewed reported ever hearing about the disease “HIV or AIDS” (95%CI: 26.3, 40.9). Recognition increased with maternal educational level [$P < 0.001$] as well as household wealth index [$P < 0.001$] (see **Table 9.1**).

Table 9.1 Knowledge of HIV/AIDS
Percentage of women who have heard about HIV/AIDS by background characteristics

Background Characteristics	Percent of women
Mother’s age	
15-19	21.7
20-34	36.2
35-49	28.1
Maternal Education	
Never attended	16.3
Some primary	24.5
Completed primary	33.3
Some middle school or higher	60.6
Household wealth index	
Poorest	15.6
Middle	28.9
Richest	64.1
Total	33.6
Confidence Intervals	(26.3, 40.9)

9.2 Knowledge of ways to prevent HIV/AIDS

Of the women who had heard of HIV/AIDS, about half knew one or more methods of preventing transmission of the disease; only 16.9% of women overall could identify one method or more (see **Table 9.2**). The remaining 16.3% of women recognized HIV but could not report any ways to prevent. Only one of the 101 women who reported recognizing HIV thought she could do nothing to prevent the disease.

Knowledge of HIV prevention strategies increased with educational level [$P < 0.001$] and household wealth index [$P < 0.001$] (see **Table 9.3**). Because of the lack of overall familiarity with HIV, it is not surprising that only two percent of women could report two or more ways of reducing HIV infection—and these women were mostly from the highest wealth index.

Abstaining from sexual intercourse was the most widely reported method of prevention: 34.7% of the women who recognized HIV reported abstinence. Using a condom and being faithful to one partner were only cited by 8% and 9% respectively (see **Table 9.4**).

Table 9.2 Knowledge of ways to avoid HIV/AIDS**Percentage of women identifying correct ways to prevent transmission of HIV/AIDS**

Ways to prevent HIV	Number of women	Percent	Confidence Intervals
Does not know about HIV/AIDS	200	66.5	(58.8, 73.3)
Knows about HIV/AIDS but does not know any methods of prevention	49	16.3	(12.6, 20.9)
Knows about HIV/AIDS but does not think you can prevent it	1	0.3	(0.0, 2.5)
Knows about HIV/AIDS and can identify 1+ methods of prevention	51	16.9	(11.7, 23.9)
Total	301	100.0	--

Table 9.3 Number of recognized methods to prevent HIV/AIDS**Number of recognized methods to prevent HIV/AIDS of women who recognize HIV by background characteristics**

Background Characteristics	No methods	One method	2 or more methods	Number of women
Mother's age				
15-19	80.0	20.0	0.0	5
20-34	47.5	46.3	6.2	80
35-49	50.0	43.8	6.2	16
Maternal Education				
Never attended	85.7	14.3	0.0	21
Some primary	66.7	25.0	8.3	12
Completed primary	62.5	37.5	0.0	8
Some middle school or higher	31.7	60.0	8.3	60
Household wealth index				
Poorest	60.0	40.0	0.0	10
Middle	54.0	42.0	4.0	50
Richest	41.5	48.8	9.8	41
Total	83.0	15.0	2.0	101

Table 9.4 Recognized methods of HIV prevention**Recognized methods of HIV prevention among women who can identify at least one method of preventing transmission of HIV**

Identified methods of prevention	Number of women	Percent
Abstain from sex	35	34.7
Use condoms	8	7.9
Limit sex to one partner	9	8.9
Stay faithful to one partner	2	2.0
Avoid sex with prostitutes	3	3.0
Avoid sex with persons who have many partners	2	2.0
Traditional methods	0	0.0
Total number of women who recognized HIV	101	--

10 MEDIA EXPOSURE

10.1 Media Coverage

Of the women in the rural central program districts, 17.9% report ever reading newspapers or magazines (95% CI: 12.3, 23.5), 64.1% report ever listening to the radio (95% CI: 56.4, 71.9), and 35.2% report ever watching television (95% CI: 26.6, 43.9). Forty two percent of women report having a radio in the household (95% CI: 34.6, 47.8). **Table 10.1** shows the percentage of women who access mass media sources less than or more than once a week. Maternal age and education level, as well as household wealth index, are important factors in determining the types and amount of media a woman can access. Younger age was associated with increased television viewing [P=0.018]. Higher levels of education were associated with increased paper reading [P<0.001] and television watching [P<0.001]. Increasing wealth was associated with increased reading [P<0.001], listening [P=0.023] and watching [P<0.001], which is expected due to the financial investment required to buy the newspaper, radio or television. While listening to the radio was strongly associated with wealth [P<0.001] and educational level [P=0.023], it was not strongly associated with age [P=0.584]. Radio remains the most popular and widest reaching form of mass media.

Table 10.1 Media coverage by background characteristics

Frequency of reading print material, listening to the radio, or watching television by women by background characteristics

Background Characteristics	Reads newspaper or magazine		Listens to the radio		Watches television		No exposure to all form of mass media	Exposed to all types of mass media	Total women
	Less than once a week	More than once a week	Less than once a week	More than once a week	Less than once a week	More than once a week			
Mother's age									
15-19	13.0	17.4	13.0	52.2	39.1	13.0	21.7	21.7	23
20-34	9.1	10.4	21.7	44.3	12.7	23.1	25.3	10.4	221
35-49	1.8	5.3	17.5	38.6	14.0	12.3	38.6	5.3	57
Maternal Education									
Never attended	3.0	2.3	24.8	31.8	11.6	7.8	39.5	1.6	129
Some primary	2.0	4.1	18.4	42.9	6.1	18.4	28.6	2.0	49
Completed primary	8.3	8.3	16.7	41.7	25.0	25.0	25.0	8.3	24
Some middle school or higher	17.2	23.2	16.2	60.6	21.2	36.4	12.1	26.3	99
Household wealth index									
Poorest	3.1	1.6	25.0	21.9	10.9	4.7	46.9	1.6	64
Middle	9.3	5.8	19.1	42.2	15.6	15.0	29.5	8.7	173
Richest	9.4	29.7	18.8	70.3	17.2	50.0	3.1	23.4	64
Total Percent	7.8	10.0	20.3	43.9	15.0	20.3	27.6	10.3	301

Of all women, 42.9% report hearing messages about maternal and child care on the radio (95% CI: 35.5, 50.2) and 27.2% report hearing family planning messages (95% CI: 20.7, 33.8). In order for radio campaigns promoting child spacing or family planning to be most effective, messages must reach the widest audience. Early morning, later afternoon, and early evening appear to be the times when the greatest numbers of women are listening to the radio (see **Table 10.2**); the 6am-8am and 6pm-8pm time slots had the highest listening rates. These times would be ideal targets for future health-related campaigns.

Table 10.2 Frequency of radio listening times
Percent of radio listeners at certain times of day

Time slots when listen to the radio	Number of women who reported listening during time slot	Percent of women who report listening to the radio that listen during time slot
6 AM - 8 AM	100	51.8
8 AM - 10 AM	23	11.9
10 AM - 2 PM	19	9.8
2 PM - 4 PM	11	5.7
4 PM - 6 PM	57	29.5
6 PM - 8 PM	77	39.9
8 PM - 10 PM	14	7.3

10.2 Exposure to film “Feto Nia Funo”

As part of their program, HAI has been showing a film about maternal and child health in Timor-Leste titled “Feto Nia Funo” in communities in target districts. Almost fifteen percent of respondents reported viewing the film (95% CI: 7.6, 21.6). The percentage of viewers was greater among the highest index level, but not the difference was not significant [P=0.543].

11 DISCUSSION

This community survey of 301 mothers of children under age two in Timor-Leste provides useful information both about the extent to which HAI’s formal objectives have been met in the project districts, and a current look at the status of maternal and newborn care practices in those districts.

HAI objectives. Based on the objectives set for HAI’s maternal and newborn care project, targets for four of the project’s six population-based objectives were met or exceeded. Substantial improvements were seen at the community level in coverage of antenatal care, skilled birth attendance, postnatal care, and breastfeeding practices. Key improvements over 2003 DHS statistics for the initial four program districts include:

- Women reporting receipt of at least one antenatal care visit rose from 50% to 82%
- Women reporting at least two tetanus toxoid injections during their last pregnancy rose from 48% to 69%
- Skilled birth attendance increased from 16% to 37%
- Vitamin A intake postpartum rose from 28% to 49%
- Exclusive breast feeding for children 0-5 months of age rose from 29% to 68%

The targeted improvement was not seen in the ability of mothers to recognize serious signs of newborn illness. No baseline number was available, but the final result showed that only 2% of women could name three or more signs of illness in a newborn, with 88% of mothers able to name at least one sign.

Health progress in the rural central region. This report provides a useful snapshot of the reach of maternal and newborn care services and changes in practices in the rural central region. Women having a child in the past two years who report one or more ANC visits has increased to 84%, up from 55% in the 2003 DHS. The MOH target for ANC visits is four or more during a pregnancy, which was reported by 56% of women overall. Our results are substantially higher than the national estimates reported in the 2007 Annual Health Statistics report: for 2007, 55.5% coverage was reported for ANC1 and for 31.0% for ANC4. There was an average of 3.8 ANC visits per woman, which is also higher than the national average reported visits of 1.6 ANC visits per pregnancy. Although there is a real possibility that mothers overestimated the numbers of visits made, the substantially greater numbers of visits in program districts than that reported nationally is encouraging. Further attempts to verify these numbers might include examining the mother's antenatal care record in the *Lisio* when available.

Tetanus toxoid coverage during the previous pregnancy nearly reached HAI's 70% goal with 69% of women receiving two or more injections. Information on the total numbers of tetanus toxoid immunizations received suggest that an even larger number the women in this study were fully protected against tetanus, since 81% stated that they had received two or more tetanus injections over their lifetime. This rate was twice that found by the MOH at the national level in 2007.

The 37% of women in the original four districts who reported the use of skilled attendants at birth matched precisely the national reported levels for birth attendance². However fewer, 32%, reported an SBA in the full six district sample. Skilled birth attendance is substantially higher than that reported in the 2003 DHS, when only 11% of births in the rural central districts were attended by health professionals. An increasing number of women are also giving birth in health facilities: in the 2003 DHS 4% of women living in the rural central region reported giving birth in a health facility and the remaining 96% at their home, while in our survey 22% reported a facility delivery. A striking positive association was seen between having at least two antenatal care visits and the use of a skilled attendant at birth, supporting a continued MOH emphasis on increasing full antenatal care coverage.

Postpartum vitamin A coverage was lower than anticipated, with only 44% of women reporting having taken the capsule within two months of delivery. In 2007, the national health data average for Vitamin A was reported to be 30.2%³, ranging at the district level from 10.2% in Ainaro to a reported 55.9% in Manatuto District. MOH staff suspect that these statistics, however, are underestimated due to the multiple locations in which these data can be recorded: IMCI register, the nutrition clinic register, and the Filariasis Control Programme data.

Results for indicators of improved newborn care were of a mixed nature. Exclusive breastfeeding was reported by 68% of women who had an infant under 6 months of age, far exceeding our target of 45%. This result also represents a marked increase from the 18% of mothers in the 2003 DHS who reported that their infant was exclusively breastfed at that age. A number of groups in addition to HAI, most notably the Alola Foundation, have been educating communities intensively on the benefits of exclusive breastfeeding. This dramatic increase in reported exclusive breastfeeding should be validated by additional studies, as the sample of women with infants in this age group was small. Even if the exclusive

² SBA: Manatuto 61.4%, Liquica 30.0%, Manufahi 17.1%, Ermera 22.7%, Aileu 22.3%, Ainaro 15.2%

³ 2006 Health Statistics Report, HMIS May 2007

breastfeeding rate is shown to be lower than reported here, however, it is likely that practices in respect to this important determinant of infant and child health are substantially improved over previous years.

Results for HAI's other indicator of improved newborn care, recognizing signs of newborn illness, were dismal: only 2% of mothers could cite three or more serious symptoms warranting consultation with a health professional. The MOH midwife training in essential newborn care, commencing in 2009, should help to address this gap in knowledge when midwives can use their new skills to teach families the signs of newborn illness. However, home births will continue to occur without the attendance of a midwife, and it will be essential to also improve home care for newborns and mothers. In only a small proportion of home births was the baby's cord cut with an appropriately clean instrument, and over one-third of infants were provided prelacteal feeds before initiation of breastfeeding. Only 15% of women had a postpartum care visit within the first 3 days after birth. These and other newborn/ postpartum care practices, not all described here, warrant further efforts if they are to improve outcomes for infants born at home without a skilled birth attendant.

Contraceptive use is clearly increasing in Timor-Leste, with a current contraceptive prevalence among all women in the sample of 26.3%, compared to 7.5% in 2003 for the rural central region. Knowledge of contraception was surprisingly high, particularly in older women. This unusual pattern may be due to the intensive family planning program that was in place during the Indonesian occupation, which would have affected women who are now at least age 30 or older. Reported discussions about family planning are relatively rare, however, particularly with husbands.

Fertility preferences appear to have decreased dramatically since 2003. In the 2003 DHS the rural central region, 49% of the sample women stated that they wanted another child. At the national level, 50% said they wanted another child, and 32% said that they wanted another child 'soon.' Even though the sample of women in the current survey was in general younger than the DHS sample, only 17% of women of all ages in our sample stated that they wanted another child soon. In the DHS, 51% of young women ages 15-19 nationally wanted another child, while in our sample only 17% of 15-19 year olds said that they wanted another child in the near future. Given the difficult economic times experienced since 2003 it is quite possible that the reality of raising children in households without financial or food security has helped bring about this change. The observed increases in contraceptive use indicate that it is likely to be a genuine shift in awareness.

Other findings of the survey are worth noting by the health care system. There was a strong association of health and health care outcomes with maternal education, for most variables, and a very strong and consistent association with the type of the family dwelling and its amenities (calculated as the wealth variable). The current MOH emphasis on providing comprehensive health services to more remote rural populations via SISCa is an important approach to ameliorating these dramatic disparities in health and health care between the wealthier, more educated families and those living on the geographic and economic margins of society. Not surprisingly, only a third of women knew about HIV or AIDS, with the expected positive association with wealth and maternal education. However, nearly three-fourths of women reported access to some media sources, particularly radio, and provided useful information about the times in the day that programming is most likely to be heard. Radio clearly has great potential for reaching even remote families with critical health information.

As this report documents, the MOH and its partners have made substantial improvements in maternal health care, contraception, and breastfeeding practices during the past four years in the rural central region. Future efforts will need to focus more heavily on supporting improved home care and care-seeking practices to promote the health of newborns and women in the immediate postpartum period. It seems likely that improving geographic access to care for pregnant women will be a critical component of further improvements. It will be important to target specifically the most rural-dwelling and impoverished families for services, as they are clearly the most in need of improved health conditions and health care.

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