

**The Base of the Iceberg:
Prevalence and Perceptions of Maternal Morbidity
in Four Developing Countries**

The Maternal Morbidity Network

Judith A. Fortney PhD and Jason B. Smith PhD, editors

Family Health International
Maternal and Neonatal Health Center
Research Triangle Park NC 27709 USA
December 1996

Copyright 1997 by Family Health International

The work described in this report was done by Family Health International with support from the Ford Foundation and the U.S. Agency for International Development (USAID). The views expressed in this report do not necessarily reflect those of either the Ford Foundation or USAID but are entirely the responsibility of the authors.

Acknowledgments

A study of this type and magnitude necessarily owes many debts of gratitude. The Maternal Morbidity Survey is no exception. By far the biggest debt is to the Ford Foundation, which supported this project from its inception in 1988 to its fruition. In particular, Dr. Marjorie Koblinsky (now with JSI MotherCare) was especially instrumental in the conception and gestation of this project; she gave immediate and enthusiastic support to what was initially only a hazy idea, and she identified the countries where the research could be implemented. Since Dr. Koblinsky's departure from the Ford Foundation, Dr. Jose Barzelatto and Dr. Margaret Hempel in the New York office have been constant sources of moral support. The Ford field offices showed early enthusiasm for this project; in particular, Drs. Saroj Pachauri in New Delhi, George Rubin in Dhaka and Sandra Lane in Cairo were most supportive. Indonesia joined the network somewhat later than the other three countries, and the collaboration was largely because of Dr. Cynthia Myntti's great interest in the area under study. All of these people have since moved on to other positions, but their successors at the Ford Foundation field offices have been no less supportive, our thanks are due to James Ross in Dhaka, Barbara Ibrahim in Cairo, Rosalia Sciortino in Jakarta, and Michael Koenig in New Delhi.

Among the Ford Foundation field staff, we extend a special thank you to Dr. Saroj Pachauri who organized the first two collaborative meetings (in New Delhi and in Bangalore) at which the early research design decisions were made. It was Dr. Pachauri who emphasized the importance of the qualitative field work which preceded implementation of the studies, and for this we are especially grateful.

Dr. Roger Rochat was with the USAID Mission in New Delhi as this survey was being developed. Because of his long-standing interest in maternal mortality and morbidity, he was very supportive of our early work, and provided financial support for the two meetings held in India.

Participating Organizations and Investigators

The Maternal Morbidity Network

1. BANGLADESH

Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies (BIRPERHT), 25 Shyamoli, Mirpur Road, Dhaka 1207, Bangladesh

Dr. Halida Hanum Akhter, Dr. Arindom Sen

2. EGYPT

Egyptian Fertility Care Society (EFCS), 2(a) El-Mahrouky Street [P. O. Box 126], Mohandeseen, Giza, Cairo, Egypt

Prof. Ezzeldin Osman Hassan, Ms. Naglaa el Nahal, Dr. Moustafa El Hussein

American University in Cairo, Social Research Center, 113 Sharia Kasr el Aini, Cairo, Egypt

Dr. Saneya Saleh

3. INDIA

Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Department of Community Medicine, Dhanvantri Nagar, Pondicherry 605 006, India

Dr. D.K. Srinivasa, Dr. K.A. Narayan

4. INDONESIA

Padjadjaran University, School of Medicine and Women's Studies Centre, Jalan Pasirkaliki 190, Bandung, Indonesia

Dr. Anna Alisjahbana, Dr. Prihatini Ambaretnani Sunu

5. UNITED STATES

Family Health International, Maternal and Neonatal Health Center, P. O. Box 13950, Research Triangle Park NC 27709, USA

Dr. Judith A. Fortney, Dr. Jason B. Smith, Dr. Patricia E. Bailey

TABLE OF CONTENTS

List of Data Tables.....	vi
List of Acronyms	vii
I. INTRODUCTION	1
A. Need for Research on Maternal Morbidity.....	1
B. Types of Reproductive Morbidity	2
C. Literature Review	3
II. STUDY DESIGN AND IMPLEMENTATION.....	11
A. Objectives of this Study.....	11
B. The Collaborative Nature of this Research	11
C. General Study Design	12
D. Specific Variations of Each of the Projects	13
E. Data Collection Methods	13
F. Study Size Considerations	15
G. Questionnaire Development; Use of Qualitative Research	17
H. Interviewer Training	18
I. Data Quality Assurance	18
J. Analysis	19
III. CHARACTERISTICS OF THE STUDY PARTICIPANTS.....	20
A. Eligibility to Participate in the Study	20
B. Characteristics of the Sample	20
C. Characteristics of the Study Participants	20
IV. PREVALENCE OF MORBIDITIES.....	36
A. During the Index Pregnancy	36
B. Long-term Morbidity.....	39
C. Discussion	40
V. RATIO OF MORBIDITIES TO MORTALITY	42
A. Number of Morbidities per Mortality in the Index Pregnancy.....	42
B. Number of Women with Morbidities per Mortality in the Index Pregnancy	43
C. Number of Women with Chronic Morbidities per Mortality	43
D. Discussion	44

VI. IMPLICATIONS FOR PROGRAMS	48
A. Knowledge of Complications	48
B. Access to Care	51
C. Discussion	52
EPILOGUE	54
APPENDICES	
Appendix 1: Data Tables	57
Appendix 2: Study Questionnaires	Printed in separate volume
REFERENCES	101

List of Text Tables

Table I.1. Ease of detection of obstetric and gynecologic morbidity	4
Table I.2. Population-based studies of reproductive morbidity	9
Table I.3. Incidence of obstetric complications in earlier studies per 100 deliveries	10
Table II.1 Perceptibility of obstetric morbidities	14
Table II.2 Study size	17
Table III.1 Association between the frequency of selected postpartum conditions and the proportion of women receiving skilled intrapartum care.....	28
Table IV.1. Specific morbidities of the index pregnancy covered in questionnaire.....	37
Table IV.2. Prevalence of morbidities during the index pregnancy.....	40
Table V.1. Estimates of maternal mortality ratios used in calculations.....	43
Table V.2. Comparison of the present study with other studies	46
Table V.3. Egyptian study results of physical examination of women reporting specific morbidities.....	47

List of Data Tables (Appendix 1)

- Table 1. Description of sample: household screen and individual record.
- Table 2. Percentage of women with selected demographic characteristics.
- Table 3. Percentage of women with selected socioeconomic characteristics.
- Table 4. Percentage of women selecting specified service outlets as usual place for treatment of "female diseases."
- Table 5. Percentage of women with live births and with other outcomes of pregnancy who had selected characteristics of the index country.
- Table 6. Percentage of women giving selected reasons for no antenatal care.
- Table 7. Percentage of women with selected characteristics of the index delivery.
- Table 8. Percentage of women delivering in specified places, by attendant at delivery.
- Table 9. Intended place of delivery, by actual place of delivery.
- Table 10. Percentage of women who perceive morbidities as serious, and percentage who sought care for morbidity among women who had specific antepartum morbidities in the index pregnancy.
- Table 11. Care seeking behavior for specific antepartum morbidities, by source of care.
- Table 12. Specific intrapartum morbidities in the index pregnancy, percent who perceived them as serious, percent who sought care.
- Table 13. Care seeking behavior for specific intrapartum morbidities, by source of care.
- Table 14. Specific postpartum morbidities in the index pregnancy, percent who perceived them as serious, percent who sought care.
- Table 15. Care seeking behavior for specific postpartum morbidities, by source of care.
- Table 16. Specific long-term morbidities, percent who sought care, and percent with lifestyle changes.
- Table 17. Care seeking behavior for specific long-term morbidities, by source of care.
- Table 18. Percentage of women with interventions at the time of the index pregnancy.
- Table 19. Percent of women with intrapartum morbidity and specific intervention.
- Table 20. Specific antepartum morbidities, by outcome of index pregnancy.
- Table 21. Specific intrapartum morbidities or interventions, by outcome of index pregnancy.
- Table 22. Specific postpartum morbidities in the index pregnancy, by outcome of index pregnancy.
- Table 23. Percent of women with morbidities in the index pregnancy, by severity of morbidity.
- Table 24. Number of long-term morbidities.
- Table 25. Ratio of morbidities to maternal mortality.
- Table 26. Ratio of women with morbidities to maternal mortality.

List of Acronyms

ADS	Asociacion Demografica Salvadoreña
BIRPERHT	Bangladesh Institute of Research and Promotion of Essential and Reproductive Health Technologies
CDC	Centers for Disease Control and Prevention
DHS	Demographic and Health Surveys
EFCS	Egyptian Fertility Care Society
FHI	Family Health International
IUD	Intrauterine device
JIPMER	Jawaharlal Institute of Postgraduate Medical Education and Research
JSI	John Snow Incorporated
PHC	Primary Health Center
PMS	Premenstrual syndrome
RTI	Reproductive tract infection
RVF	Rectovaginal fistula
STD	Sexually transmitted disease
TB	Tuberculosis
TBA	Traditional birth attendant
USAID	U.S. Agency for International Development
UTI	Urinary tract infection
VVF	Vesicovaginal fistula

I. INTRODUCTION

A. Need for Research on Maternal Morbidity

Each year, 585,000 women in the world die because they are pregnant (Stanton et al, 1995), and almost all of them live and die in developing countries. The extent of maternal mortality was first made widely known at the 1987 Safe Motherhood Conference in Kenya. It is often said that this statistic reflects only the "tip of the iceberg," and that many more women suffer life-threatening complications which they survive, although sometimes with residual, chronic problems that may plague them for the rest of their lives.

Knowledge of the many facets of maternal mortality is now quite broadly dispersed. Its terrible magnitude, the gap between developed and developing countries, and the consequences for individuals, families and communities are understood by much of the international reproductive health community. There are hundreds of studies in scores of countries which attest to the attention maternal mortality has received.

Maternal morbidity, on the other hand, has been largely ignored except for hospital-based studies of numerator populations. Existing research tells us very little about the real prevalence of maternal morbidity in communities worldwide. At this time, there are quite a few studies of maternal mortality that are population-based, but only five studies of obstetric (maternal) morbidity that could be characterized as population-based (Datta et al, 1980; DHS, 1994; Bhatia & Cleland, 1995, 1996; de Graft-Johnson, 1994; ADS & CDC, 1994). In addition, there are a few population-based studies focusing on other aspects of reproductive morbidity — a broader concept than maternal morbidity (Fortney, 1995) — some of which include conditions that could be of obstetric origin. There are, however, not more than a dozen population-based studies of reproductive morbidity.

By the mid to late 1980s, the need for population-based studies of reproductive morbidity in general, and maternal morbidity in particular, had become apparent. The research described here was developed in response to that need, and describes "the base of the iceberg."

B. Types of Reproductive Morbidity

While there is more than one definition of maternal mortality, which researchers dispute, the definitions themselves are quite clear.¹ However, for maternal morbidity, the underdeveloped state of this research field is apparent in the lack of clear definition of types of morbidity to be investigated. In particular, little uniformity exists in the use of an overall framework of reproductive morbidity. The broad category of reproductive morbidity includes maternal (obstetric), gynecologic and contraceptive morbidities. There have been investigations of all of these, and clearly there is overlap between categories.

The World Health Organization, in 1989 (World Health Organization, 1989), defined reproductive morbidity in the following broad terms:

1. *Obstetric Morbidity.* Morbidity in a woman who has been pregnant (regardless of the site or duration of the pregnancy) from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Obstetric morbidity falls into three categories:

a. Direct obstetric morbidity results from obstetric complications of the pregnant state (pregnancy, labor and the puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above. This can include temporary conditions, mild or severe, which occur during pregnancy or within 42 days of delivery, or permanent/chronic conditions resulting from pregnancy, abortion or childbirth. Some chronic conditions (such as anemia or hypertension) may be caused by pregnancy and delivery, but are equally likely to have other causes.

b. Indirect obstetric morbidity results from a previously existing condition or disease, such as sickle cell disease or tuberculosis, which was aggravated by the physiologic effects of pregnancy. Such morbidity may occur at any time and continue beyond the reproductive years.

c. Psychological obstetric morbidity may include puerperal psychosis, attempted suicide, strong fear of pregnancy and childbirth, and may be the consequence of obstetric complications, obstetric interventions, cultural practices (such as isolation

¹ See for example, the ICD-10 definition which differs from its predecessor in ICD-9 (WHO, 1993).

during labor and delivery), or coercion.

2. Gynecologic Morbidity. This category includes any condition, disease or dysfunction of the reproductive system which is not related to pregnancy, abortion or childbirth, but may be related to sexual behavior.

a. Direct gynecologic morbidity includes reproductive cancers, premenstrual syndrome (PMS), endocrine system disorders, bacterial or viral sexually transmitted diseases (STDs) and their sequelae (cervical cancer, pelvic inflammatory disease (PID), secondary sterility, AIDS), reproductive tract infections (RTIs), coital injuries.

c. Indirect gynecologic morbidity includes primarily traditional practices, some of which are for treatment of real or perceived gynecologic conditions (such as female genital mutilation, gishiri cuts).

c. Psychological morbidity includes psychological disorders associated with STDs, infertility, traditional practices, dyspareunia, fistulae, rape.

3. Contraceptive Morbidity. This category includes conditions which result from efforts (other than abortion) to limit fertility, whether they are traditional or modern methods. Examples include menorrhagia from IUD use, thromboses from oral contraceptive use, and wound infections after Norplant insertion.

Thus, studies which focus on the research methodology used for studies of reproductive morbidity is determined to a large extent by the focus. Much gynecologic morbidity remains unnoticed by the affected woman, especially in its early stages (e.g., cervical cancer, RTI). A much smaller proportion of obstetric morbidity remains inapparent to the woman (e.g. hypertension) (Table I.1). Thus studies focusing on gynecologic morbidity, especially if RTI and STD are important components, will need to place a greater emphasis on physical examination and laboratory testing, and cannot be undertaken retrospectively. Studies focusing on obstetric morbidity, on the other hand, can depend more heavily on the respondents' self-report which, as Stewart and Festin (1995) have reported, is valid for many conditions. There are both obstetric and gynecologic symptoms that cannot be validated by physical examination, such as dyspareunia, pain (pelvic, back, on urination), dizziness, blurred vision, nausea, or irregular menses.

C. Literature Review

Studies to assess the prevalence of reproductive morbidity can be quite broad and cover all the aspects of reproductive morbidity described above, or can focus on just one category such as gynecologic morbidity or a subset of a category such as cancer or STDs, or an even smaller subset such as cervical cancer or gonorrhea. The more specific the focus, the greater the number

The Base of the Iceberg: Chapter I

of studies, although few are population-based.

Table I.1. Ease of detection of obstetric and gynecologic morbidity.		
Morbidity	Symptomatic	Asymptomatic
Obstetric	edema, some vaginal infections, fever, some medical conditions, bleeding, fits or seizures, obstructed or prolonged labor, cesarean delivery, torn perineum, sepsis, prolapse, fistula, dyspareunia	hypertension, proteinuria, some medical conditions, anemia, torn cervix
Gynecologic	some STDs, dyspareunia, menstrual disorders, infertility, pelvic pain, UTI, late stage cancer	some STDs, endocrine disorders, early stage cancer
Contraceptive	excessive bleeding, pelvic pain, dizziness, headaches, irregular menstrual bleeding, spotting,	anemia, hypertension, some thromboses

This report focuses on maternal (obstetric) morbidity, an area few other investigators have chosen, although several investigators have pioneered this territory before us. The following are studies of reproductive morbidity,² some of which include obstetric morbidity. All of these investigators found more morbidity (of all categories) than they had expected. The foci of these

²Several of these studies are population-based, although the population is sometimes quite small. While the study by Wasserheit and colleagues is clinic-based, the clinic population was one that was not seeking treatment of any condition. The study by Franks et al, was based on all antepartum hospitalizations in US reporting institutions.

studies are summarized in Table I.2.

1980. The earliest study was done by Datta and his colleagues (Datta et al, 1980) in India. Their prospective cohort study measured any morbidity (illness) occurring to women while they were pregnant, regardless of its cause, but illnesses related to pregnancy, childbirth and puerperium were identified. Their population was defined as all pregnant women in the village of Baskripalnagar (Rajasthan) during the years 1974-1979. Some women (66 of the 281) were observed for more than one pregnancy. The authors report that 48%, 32%, 33% and 32% of pregnant women reported morbidity (continuing and new episodes) in the first, second and third trimesters and the puerperium respectively. They do not report the proportion of women who experienced no morbidity at any time during their pregnancy. This study is the source of the often-quoted ratio of 16.5 obstetric morbidities per maternal death (often rounded to 15).

Number of maternal deaths	2
Number of new illnesses reported	116
Ratio of new illnesses to maternal death	58
Number of illnesses related to pregnancy, childbirth and the puerperium	33
Ratio of obstetric illnesses to maternal death	16.5
<i>Source: Datta et al; 1980</i>	

1985. Wasserheit and her colleagues (Wasserheit et al, 1989) in Bangladesh were interested primarily in RTIs. Their study population consisted of married women of reproductive age who attended a family planning clinic, were not pregnant, had not recently changed contraceptive methods, and who did not have other conditions which might cause pelvic pain. They examined only women who reported symptoms of STDs. They found that 22% of women reported symptoms consistent with RTI and were therefore referred for examination. Sixty-eight percent of these women had clinical and laboratory evidence of RTI.

1989. Bang and her colleagues (Bang et al, 1989) in India examined gynecologic morbidity which they defined as "structural or functional disorders of the female genital tract **other than** abnormal pregnancy, delivery or the puerperium." The population consisted of all reproductive age women who volunteered to be examined in two villages in Gadchiroli district in Maharashtra. They found that 92% of these rural women had at least one gynecologic condition. Findings were based on solely physical examination by a woman doctor regardless of whether they reported symptoms. The authors report that 98.4% of symptomatic and 84% of asymptomatic women had at least one condition. Only 8% had undergone examination and treatment in the past. Only 72% were of reproductive age, and their conditions are not reported

52.7% had menstrual disorder
7.9% had sexual problems
27.8% had vaginal infections
70.6% had cervical disease
28.5% had PID
<i>Source: Bang et al, 1989</i>

The Base of the Iceberg: Chapter I

separately.

1992. Analyzing hospital discharge data, Franks and her colleagues (1992) found considerably more morbidity in the antepartum period than had been expected. Morbidities related to abortions or term pregnancies were excluded. Also excluded were morbidities (such as hypertension) which were treated by delivering the infant. The estimate of 22 antepartum hospitalizations for each 100 deliveries is, by definition, limited to morbidities severe enough to require hospitalization, and is, therefore, an underestimate of all antepartum morbidity. Multiple admissions for the same woman were counted separately.

Preterm labor
Genitourinary infection
Antenatal hemorrhage
Excessive vomiting
Pregnancy induced hypertension
Diabetes mellitus

Source: Franks et al, 1992

The average hospital stay was two to three days, resulting in a far greater burden on the health care system (and on women) than the authors anticipated.

1993. Younis and his colleagues (Younis et al, 1994) in Egypt also focused on gynecologic morbidity, defined as "conditions of ill health unrelated to a pregnancy episode, such as reproductive tract infections (RTIs), cervical cell changes, and genital prolapse. Other related morbidity conditions that are commonly associated with reproductive morbidities include urinary tract infections (UTIs), anemia, hypertension, obesity, and syphilis." (The specific conditions are shown in the box to the right.) Younis' study aimed to determine the prevalence of gynecologic and related conditions in 509 ever-married women randomly selected from two communities. The population was all ever-married women aged 14-60 (though 91% were aged 45 or younger) who were not currently pregnant, resided in a defined area, and who agreed to be examined. Only 8.6% of women refused participation. Although the investigators did not include women who were pregnant, they did examine women for prolapse which is often of obstetric origin. Women found to have treatable conditions received treatment. All of the conditions reported in this study were identified by physical examination or laboratory test.

conditions:
Lower reproductive tract infections (six organisms)
Upper reproductive tract infections
Cervical ectopy
Cervical cell changes
Genital prolapse
Urinary tract infection
Anemia
Hypertension
Obesity
Syphilis

Source: Younis et al, 1994

Gynecologic morbidities were found to be quite prevalent: 44% had vaginitis (22% bacterial vaginosis, 18% trichomoniasis, 11% *candida albicans*), 10% had cervicitis (almost all chlamydia),

2% had PID (using a less rigid definition, an additional 17% possibly had PID), 22% had cervical ectopy and 11% had other cervical cell changes. Finally 56% had some degree of genital prolapse and 8% had prolapse involving the uterus. Related morbidities were also quite common: 14% had UTI, 17% were anemic (<12gm/dl), 43% were obese (Quetelet index >25; 20% had QI>30). Only 0.8% had syphilis.

1994. More recently, Stewart and her colleagues (DHS, 1994) in the Philippines conducted the first published study to look primarily at obstetric morbidity. They collected data on specific conditions, some of which are life-threatening (postpartum hemorrhage, sepsis, eclampsia and dystocia requiring cesarean section), while others were less serious (premature rupture of membranes, and multiple births, among others). The study population was drawn from a nationally representative sample and the survey was conducted in conjunction with the Demographic and Health Survey. This study is particularly important because it validated self-reporting of obstetric complications (Stewart & Festin, 1995). They identified women who had delivered in hospital, some of whom had experienced complications during labor, delivery or immediate puerperium, and some of whom had not. Identified women were contacted at home an average of 25-33 months after delivery and asked about complications they experienced during the perinatal period. The sensitivity and specificity of the questions were calculated.³ These findings are shown in the box; there was no tendency in the ability to recall some complications better than others. Overall, 10.9% of the respondents had life-threatening complications in the peripartum period, and an additional 51.9% reported less serious complications during that period.

	Sensitivity	Specificity
Hemorrhage	70%	78%
Dystocia	69%	97%
Sepsis	89%	83%
Eclampsia	44%	96%

Source: Stewart et al, 1995

1994. A nationally representative survey of 6,207 women aged 15-49 in El Salvador (ADS & CDC, 1994) found that among women whose pregnancies did not end in miscarriage, 35% had edema of legs and/or face, 18% were told they were anemic, 14% were told they were hypertensive (with no previous history of hypertension), and 6.3% reported antepartum bleeding or spotting. Fifteen percent of women with live births reported that the labor lasted longer than 24 hours, 28.6% reported intense bleeding during delivery, and 1.8% reported convulsions in the peripartum period. Postpartum bleeding was more common (35.4%) than intrapartum.

India: Of 3600 women under 35, with a child under 5:

³Sensitivity is the proportion of women with the condition, who correctly reported that they had the condition. Specificity is the proportion of women without the condition, who correctly reported that they did not have the condition.

The Base of the Iceberg: Chapter I

1995. Bhatia and Cleland (1996) in India found that 18% of women reported a prenatal complication, 8% during delivery and 23% postpartum. Eight percent reported potentially life-threatening complications during delivery and 10% after delivery (this last number does not include infections, reported by 17% of women). Because different definitions were used it is difficult to compare their findings directly with those of Stewart and Festin (1995), but Table I.3 shows that they are not inconsistent. As part of a larger study to determine the pathways (including health) through which mother's education influences the child's survival, Bhatia and Cleland asked about obstetric and gynecologic health in a subdistrict of Karnataka. The population (not representative) consisted of 3,600 women under 35 years who had a child under 5 years. The data described here are cross-sectional and were collected in face-to-face interviews conducted in the woman's home.

41% had at least one morbidity associated with their last pregnancy, 10.2% had at least one potentially life-threatening complication. 18% had morbidities in the antenatal period, and 23% had morbidities in the postpartum period. The proportion with long-term morbidity is not reported.

Source: Bhatia & Cleland, 1995, 1996

Table I.2 summarizes the focus of the studies described above. For the purposes of comparison with the study described in this report, the first one (Datta et al, 1980) and the last four are the most important. Table I.3 summarizes the empirical findings for the frequency of specified complications of labor and delivery (complications of pregnancy, and postpartum morbidities are not shown) for three of these studies.

Table I.2. Population-based studies of reproductive morbidity.			
Author, year	Obstetric	Gynecologic	Contraceptive
Datta et al, 1980 India	yes	Yes	no
Wasserheit et al, 1985 Bangladesh	no	yes STD only	yes
Bang et al, 1989 India	no	yes	yes
Franks et al, 1992 USA	yes antepartum only	no	no

The Base of the Iceberg: Chapter I

Younis et al, 1993 Egypt	no except prolapse	yes	no
de Graft-Johnson, 1994 Ghana	yes	no	no
Stewart et al (DHS), 1994 Philippines	yes	no	no
ADS & CDC, 1994 El Salvador	yes	no	no
Bhatia and Cleland, 1996 India	yes	yes	no

The Base of the Iceberg: Chapter I

Table I.3. Incidence of obstetric complications in earlier studies per 100 deliveries.			
Complication	India <i>(Bhatia & Cleland, 1996)</i>	Philippines <i>(Stewart & Festin, 1995)</i>	El Salvador <i>(ADS & CDC, 1994)</i>
Eclampsia	0.5	1.3	1.8
Hemorrhage	12.2	7.7	10.8
Sepsis	not reported	2.4	not reported
Prolonged labor	5.7*	15.2**	15.0***
Any life-threatening	10.2	12.0	not reported

*>18 hours **>12 hours ***>24 hours

II STUDY DESIGN AND IMPLEMENTATION

A0 Objectives of this Study

The research was conducted in Bangladesh, Egypt, India, and Indonesia. The concept for the study was explored with the Ford Foundation beginning in 1988, and thereafter developed in collaboration with the Bangladesh Institute of Research for Promotion of Essential and Reproductive Health Technologies (BIRPERHT), the Egyptian Fertility Care Society (EFCS), and the Department of Community Medicine at the Jawarhalal Institute of Postgraduate Medical Education and Research (JIPMER) in Pondicherry, India. A fourth institution, the Health Research Unit, the School of Medicine, Padjadjaran University in Bandung, Indonesia, joined the collaboration later. The purposes of this research in four developing countries were to determine:

- the occurrence of morbidity during pregnancy and childbirth
- the proportion of pregnancies that involve potentially life-threatening and/or permanent morbidity
- the prevalence of permanent morbidities associated with pregnancy and childbearing
- the magnitude of the morbidity to mortality ratio
- perceptions of morbidity, its implications, seriousness, whether women seek care for it, and who are the preferred health care providers for its treatment
- the main impediments to seeking care and potential interventions to overcome them.

B0 The Collaborative Nature of this Research — The Maternal Morbidity Network

The research reported here was the result of a collaborative effort on the part of both national and international organizations interested in the promotion of women's health (the Maternal Morbidity Network). The study was carried out in four countries: Bangladesh (national survey), Egypt (Menoufeya Governorate), India (Pondicherry and the State of Tamil Nadu), and Indonesia (Tanjungsari, West Java). Sponsorship of the study was provided by the Ford Foundation through grants to each national study team and through a coordinating grant to Family Health International. Each individual study was designed and implemented by the national team of

The Base of the Iceberg: Chapter II

investigators in consultation with all other national teams for the purposes of overall comparability of results. In each country, approvals from the appropriate government oversight agencies were requested and obtained prior to initiation of study activities.

The Network met annually (in each of the countries where the research was implemented) to review progress, discuss issues and make decisions, and to plan future activities. The first meeting (in New Delhi) was partially funded by the U.S. Agency for International Development as well as by the Ford Foundation.

The data remain in the countries of origin. Analysis was done by completing a collaboratively agreed upon analysis plan. This report was written by staff of Family Health International in North Carolina, and reviewed by the collaborating investigators. The studies as they were implemented at each site stand alone. Analyses have been conducted independently by the investigators and the findings submitted for publication.

C0 General Study Design

The Ford Maternal Morbidity Study was designed so that information gathered from each of the four sites could be used to make comparisons across sites. Several processes were built into the study design to foster a common approach and coordinate the overall study.

The first commonality was in the design of the research teams. Each team was originally selected to have one senior researcher and one junior researcher from each site. This team configuration provided a training/mentoring opportunity designed to expand and improve the pool of expertise in the area of maternal health research.

The prime mechanism for coordinating common study activities was a series of five investigator meetings which took place at key points in the development and conduct of the study and were held approximately once a year. These meetings were an invaluable part of the research process, allowing the investigators a high degree of scientific autonomy and control over study directions. The meetings also provided investigators with a forum in which they could discuss study problems and concerns, as well as their successes and solutions, with knowledgeable and dedicated colleagues engaged in the same work. The first meeting in New Delhi concentrated on planning and initiating the development of the core questionnaire. The second meeting in Bangalore was concerned with finalizing the core questionnaire and planning for data collection. The third meeting in Dhaka was held to discuss data collection issues and plan for analysis. The fourth meeting in Bali focused on analysis issues. The fifth and final meeting in Cairo centered on table design and reporting issues.

One result of the coordination meeting process was a common research approach. The core questionnaire consisting of items to be gathered from all sites was developed by a consensus

process with the active participation of each country research team (the four questionnaires — in English — are shown in Appendix 2, printed in a separate volume). Common study definitions were agreed upon for use as benchmarks at each site. Qualitative research was conducted in each study site prior to data collection to discover the perceptions local women had of various morbidities and to determine the language they used to describe these conditions. In each case this qualitative information was used to improve the survey instrument. After considerable discussion and debate, common analysis and reporting protocols were developed.

D0 Specific Variations of Each of the Projects

While sharing many common elements, each national study stands on its own and retains its own unique identity and characteristics. The Bangladesh study had two arms, the comparative retrospective survey which is reported here, and a non-comparative prospective arm which will be described separately elsewhere by the national investigators. The study sample in Bangladesh was unique in that it was designed to provide estimates representative of the nation as a whole. The Egyptian study was conducted to represent the population of one governorate (Menoufeya). In addition to the comparative retrospective survey included in this report, the Egyptian investigators also conducted a nested case-control study of the validity of survey self-reports. Women identified in the survey as having a chronic morbidity were clinically examined in a referral hospital, along with controls matched on age and place of residence. In India, the study was conducted using a sample representing the catchment area for the JIPMER referral hospital. The Indian investigators spent considerable time and effort interviewing traditional birth attendants and experimenting with various qualitative research techniques. In Indonesia, a previous prospective study of the risk approach had been conducted in a cohort of all pregnant women in Tanjungsari subdistrict, Sumedang district, West Java during a two-year period beginning October 1987. In the current study of maternal morbidity, this cohort formed the pool of women eligible for follow-up. Extensive qualitative analysis was also done in Indonesia and sets the quantitative data in their social context.

E0 Data Collection Methods — Self-reporting vs Physical Examination vs Laboratory Tests

Can women correctly perceive, remember, and report morbidities they experienced during pregnancy, labor, delivery and the postpartum period? Some morbidities are readily perceived by the woman herself and/or her family members, others are not. Table II.1 below shows the conditions that were measured in this study, the perceptibility to the woman experiencing them

Table II.1 Perceptibility of obstetric morbidities.

Morbidity	To woman herself and/or family	To clinician
Antepartum Edema Hypertension Fits/convulsions Vaginal bleeding Fever >3 days Severe vomiting Urinary problems Pulmonary tuberculosis Malaria Jaundice Rheumatic heart disease Varicose veins	yes no yes yes yes yes yes some some some yes yes some yes	yes yes no* no* yes no some yes yes yes yes yes yes
Intrapartum Labor >18 hours Fits/convulsions Loss of consciousness Excessive bleeding Ruptured uterus Perineal/vaginal tear	yes yes yes some no some	no* no* no* yes yes yes
Postpartum Pelvic pain Painful urination Excessive bleeding High fever Foul smell/discharge Breast condition Shock or loss of consciousness Depression ≥ 2 weeks Depression < 2 weeks Fits/convulsions	yes yes some yes yes yes yes yes yes yes yes	no no yes yes yes yes yes no* no* no*
Chronic Incontinence/VVF Rectovaginal fistula passage of stools passage of gas Uterine prolapse Dyspareunia Hemorrhoids	yes yes yes some yes some	some some some yes no yes

*These conditions are discernible to the clinician if they occur at the time of the examination.

and to the clinician examining her. The table shows that, unlike many gynecologic conditions, most maternal morbidities are apparent to the woman and/or her family. This answers the first part of our opening question. The second part of the opening question is whether women can correctly remember and report the morbidities they experienced. Stewart and Festin (1995), working in the Philippines, addressed this question for intrapartum and immediate postpartum morbidities by asking women who had delivered in hospital (and whose condition was a matter of record) whether they experienced complications (see box in Chapter I). The most important lesson from this analysis is that conditions are more likely to be **underreported** than **overreported**. Interestingly, the sensitivity for reporting of prolonged labor **decreased** with duration of labor: 12+ hours was 0.41, 16+ hours was 0.31, and 24+ hours was 0.18; while about 90% of those with a labor of normal duration correctly reported it. Another important finding of this study was that time since delivery (up to four years) did not affect the accuracy of recall.

It is important to note that obstetric morbidity is unlike most gynecologic morbidity in that it is feasible to rely on self-reporting of almost all conditions. In the case of gynecologic morbidities on the other hand, many conditions are detected mainly through a clinical examination or a laboratory test; common examples include RTIs, gynecologic cancers, and endocrine disorders. Interviews with women are unlikely to uncover any significant proportion of gynecologic morbidity, particularly in the early stages of disease. RTIs are an important cause of morbidity during pregnancy that our study could not detect.

F0 Study Size Considerations

The most important consideration in determining study size was to collect enough cases of "major" morbidity for analysis.⁴ Our target was approximately 200 "major" morbidities at each site. Because of the nationally representative character of their study, Bangladesh decided to aim for 400. As one purpose of the study was to determine the prevalence of morbidity, we based our estimate on the level of maternal mortality, the number of expected births in the selected area, and Datta's 1980 estimate of 16.5 morbidities for each mortality (in full knowledge of the limitations of the analysis by Datta and his colleagues).

From the required number of eligible women, we estimated the population size and the number of

⁴Major morbidities were defined as antepartum, intrapartum or postpartum hemorrhage, fits or convulsions, edema, hypertension, prolonged fever (more than three days), severe vomiting, labor longer than 18 hours, vaginal or cervical tear, shock or loss of consciousness, foul discharge, and malaria or pulmonary tuberculosis.

The Base of the Iceberg: Chapter II

households necessary to meet the target. To estimate the number of households to be visited,

we required the following information:

- maternal mortality ratio
- crude birth rate
- population
- average household size
- number of years of pregnancy accumulation (i.e., pregnancy within last two, three or five years, depending on study site).

The calculation was also based on the premise that levels of morbidity would vary as widely as levels of mortality — a premise only partly supported by study results.

1. Bangladesh. The study in Bangladesh covered four geographic divisions, and it was planned to identify at least 100 major morbidities in each division. Based on a maternal mortality ratio of 600, and a crude birth rate of 33 (Bangladesh Bureau of Statistics), it was estimated that the approximately 6,000 pregnancies needed would require 7,025 households equally divided between the four divisions. Eligibility was defined as any married woman with a pregnancy in the last two years, and 7,031 eligible women were interviewed.

2. Egypt. Based on a maternal mortality ratio of 190 (Fortney et al, 1988) for the study area, and a crude birth rate of 35, it was estimated that a sample of 14,000 households would be required to yield 200 major morbidities. However, after this estimate was made, the preliminary findings from the Giza morbidity survey (Zurayk et al, 1993) became available; that study found gynecologic morbidity to be much more common than expected, so we reduced the anticipated necessary study size. The final estimate was that 7,000 households would be required to identify 4,000 eligible women (women with a pregnancy in the last five years). Allowances were made for refusals and other types of non-response. The final study size was 7,325 households, yielding 4,548 eligible women.

3. India. The study in India covered two geographic areas, the Union Territory of Pondicherry and the adjoining South Arcot District of Tamil Nadu which is also part of the catchment area for the JIPMER hospital. Estimates were based on a maternal mortality ratio of 100 for the urban area and 400 for the rural area, and crude birth rates of 21.6 and 23.0 for the two areas respectively. In the final sample, rural residents accounted for 70% and urban residents 30%. A total of 13,235 households were visited. Women were eligible to participate if they had been pregnant in the last two years. 3,502 eligible women were interviewed, 64% from South Arcot District of Tamil Nadu and 36% from Pondicherry.

4. Indonesia. The design of the study in Indonesia was inherently different, and, to a large extent, study size was mandated by the size of the available cohort from a previous prospective study of pregnancy. All women identified as being "at risk" during the initial risk approach study were included in the maternal morbidity study sample. Half of the cohort "not at risk" was

The Base of the Iceberg: Chapter II

sufficient to meet the size requirement of the maternal morbidity study. A randomly selected 50% of women classified as having no risk factors in the initial study were included in the current study sample. In addition to the survey element, all women found to suffer from a pregnancy related morbidity were referred to the subdistrict hospital for treatment. The index pregnancies occurred in 1988 and 1989, and the women were interviewed for the present study in early 1993. The exclusions described above left 3,180 women eligible to be in the study, of whom 1,154 were not interviewed because they had had a subsequent child and antenatal data had been collected only for the index child.

Table II.2 Study size.			
Site	Households visited	Eligible women	Completed interviews
Bangladesh	27 952	7 031	6 493
Egypt	7 221	4 548	4 522
India	13 235	3 502	3 339
Indonesia	3 180	3 180	1 926

G0 Questionnaire Development; Use of Qualitative Research

The study questionnaire included a core set of questions used at all study sites and a second set of optional questions designed to meet the unique needs of each site. The draft questionnaire was developed in English and then translated into the local language used to conduct the interviews. Qualitative research in each site was used to discover the perceptions of women regarding morbid conditions as well as the language used to describe them. This qualitative information was used to improve the local questionnaires allowing researchers to better define certain types of morbidity, explain the signs and symptoms of each morbid condition, and to elicit information from the women about their health care seeking practices. Each local questionnaire was pretested before being finalized and each was then back-translated as a check of the meaning in the original version.

H0 Interviewer Training

While the particulars of interviewer training varied from site to site, there were certain essential common elements across sites:

- All field interviewers were carefully selected for this study.
- All interviewers were female.
- Most interviewers were health/social service professionals.

All field interviewers were given comprehensive training before field implementation of the study. In some cases the training was a continuous session for a number of weeks. In some cases, the training occurred in a series of sessions held over the space of a few months. All training sessions had common content elements. Each training program made use of both didactic and hands-on training methodologies. Each program provided training in reproductive anatomy and physiology, training on use of the study instrument(s), and training on conducting the interview. In each case, the program took into account the special circumstances which might occur when interviewing women about potentially sensitive reproductive health topics and included training on answering questions that participants might ask and managing process problems that could occur during the course of an interview.

I0 Data Quality Assurance

Data quality assurance was the responsibility of the investigation team at each site. While the particulars of data quality assurance varied somewhat by site, there was a set of minimum common elements implemented across sites. All field interviewers were organized into teams headed by a trained supervisor. All data collection forms at each site were reviewed by a supervisor for completeness and correct coding. In all sites, senior research staff made site visits, on an ad hoc basis, and conducted spot checks of data quality. In addition to these common elements, the Egyptian team opted to conduct a systematic 5% re-interview. The Bangladesh team conducted re-interviews of 5-10% of respondents questioned during site visits. The Indian team conducted in-depth re-interviews with a subset of women reporting morbidities during their initial interview.

Once all data was collected and cleaned, each research team completed a set of standard reporting tables and submitted them to FHI. All data reported in these tables were reviewed for completeness, internal consistency, and consistency across sites. Any missing, inconsistent or otherwise questionable reports were queried and resolved prior to presentation in this report.

J0 Analysis

The Base of the Iceberg: Chapter II

The study had two main goals: the first was to estimate the prevalence of maternal morbidity in the four sites; the second was to develop a new estimate of the ratio of morbidity to mortality.

The analysis plan was developed collaboratively at one of the annual investigators meetings. The data remained with the investigators, and all the analysis was done in-country. The comparisons between sites and the conclusions from the comparisons were made by the FHI coordinators at the project headquarters in North Carolina. This report was drafted in North Carolina before being sent to each investigator for further input.

1. *Univariate analysis.* The samples were described in terms of their sociodemographic characteristics, which were compared among the sites.

2. *Bivariate analysis.* For the purposes of this analysis, maternal morbidity was categorized into four types, the first three are based on the time during pregnancy and puerperium during which the morbidity occurred: antepartum, intrapartum, postpartum. The fourth was chronic morbidity. The multivariate analysis was done within this framework. Within each time period, the incidence of morbidity is examined in terms of the response to it — whether care was sought, and where it was sought.

3. *Rates and ratios.* The prevalence of morbidity was examined in terms of the number of morbidities that occurred, and the number of women experiencing any morbidity. Prevalence was further analyzed by the degree (number and severity) of morbidity experienced by the women. Finally, we estimated the number of maternal morbidities per maternal mortality.

III CHARACTERISTICS OF THE STUDY PARTICIPANTS

A0 Eligibility to Participate in the Study

Women in the study were of reproductive age and had been pregnant within a defined period of time (two years in India and Bangladesh, five years in Egypt, and three to four years in Indonesia). Although women whose pregnancies did not end in a live birth were eligible for inclusion, in practice they may have been less likely to be included because such pregnancies are more likely to be forgotten or even concealed. India restricted the sample to married women, but even in the other study sites where this restriction did not apply, in practice only married women were interviewed.

B0 Characteristics of the Sample (Table 1)⁵

Households in the sample areas were chosen according to criteria established in advance and according to defined statistical criteria. In each household, all members were listed; the mean household size ranged from 4.5 in Indonesia to 5.8 in Egypt. Eligible women (aged 15-49, pregnant within a defined time period) were identified. In India and Bangladesh, if more than one eligible woman per household was identified, only one was selected at random to be interviewed. In Egypt, however, up to three women were interviewed; when more than three were eligible, the youngest and the oldest only were interviewed. Interviewing took place within a relatively short period of time (three to six months); it took place the same day in Egypt. Refusal rates were low; in Bangladesh, 92.3% of eligible women were interviewed, in Egypt 99.4%, and in India 95.2%. Indonesia contacted a proportion (60%) of women who had been in an earlier prospective study; the proportion was limited primarily because of resources. Of those women with whom contact was made (i.e. they were both selected and located), almost 100% were interviewed.

C0 Characteristics of the Study Participants

1 Demographic Characteristics (Tables 2, 3)

⁵Except for Table III.1, the tables referred to in this chapter are found in Data Tables (Appendix 1).

The *current* age of the sample of Indian women was less than the study participants at the other sites. The mean age of the Indian women was 24.7 ± 4.6 years compared with 26.2 ± 6.1 in Bangladesh, 29.6 ± 6.3 in Indonesia, and 30.1 ± 6.6 in Egypt. Furthermore, 76.2% of the Indian women were between the ages of 20 and 29, compared with 58.9% in Bangladesh, 45.1% in Egypt, 50.1% in Indonesia. Bangladesh and India had a greater percentage of women under twenty than did Egypt and Indonesia; and there was conversely a smaller percentage aged 40 or over.

The mean parity (live births) was highest in Egypt (3.6 ± 2.1) compared with only 2.1 ± 1.2 in India, 2.8 ± 1.8 in Indonesia, and 3.2 ± 2.2 in Bangladesh.

The Indonesian sample was very different from the others in terms of education and employment. Fully 90.0% of the Indonesian women were literate and only 2.2% had no education; 47% had paid employment. Egypt and India were similar with respect to education; about half had received no schooling and a little more than 40 percent were literate; but Indian women were much more likely to have paid employment than Egyptian women (48.5% compared with 22.1%). Only 37.3% of the women in the Bangladesh sample were literate and 62.7% had never been to school; only 15.3% were in paid employment. The husbands of the women in the samples were more likely than their wives to have attended school, and the pattern was generally similar across the four countries.

2 Source of Prepregnancy Health Care (Table 4)

We asked women where they *usually* went for treatment of "female diseases." A large number of women in Bangladesh and India had no usual source of care. Among Bangladeshi women who did have a usual source of care, a majority sought care from providers of non-Western medicine. Indian women who did report a usual source of care were more likely to report going to government health centers/hospitals or private clinics/hospitals. Almost all Egyptian women had a usual source of care, and for nearly half, this was a private clinic; almost all the rest used government facilities, and little reliance was placed on traditional providers. Virtually all Indonesian women also had a regular source of care and the vast majority went to the government health center, and only a few to the private sector. Apart from Bangladesh, few women reported using non-Western providers as their usual source of care for "female diseases."

3 Use of Antepartum Health Care in Index Pregnancy (Tables 5, 6)

There was greater utilization of antenatal care in India and Indonesia than in Bangladesh and Egypt. In India, only 2% of women had no care, compared with 14% in Bangladesh and 32% in Egypt. All women in Indonesia reported that they had had antenatal care. Where antenatal care was less common (Bangladesh and Egypt), the lack of care was much more pronounced among women who did not have a live birth, suggesting benefits may have been derived from prenatal care. The average number of visits among women who sought prenatal care was more than five

in India and Indonesia, two in Bangladesh and 3.5 in Egypt.

The provider of prenatal care varied substantially among the four sites. In Egypt and India, the government health center was the most important source. A proportion of women in India received antenatal care at home from government health workers as well as visiting the health clinics. In Bangladesh, while the government health center provided about one quarter of the antenatal care, the most important source (58 percent) was home visits by a health worker. Private hospitals and clinics were an important source in Egypt and India, but negligible in Bangladesh. No data on providers are available for Indonesia.

The reason for seeking antenatal care varied widely. The majority of Indian women went for antenatal care because they felt it was useful to have a checkup; about a third of Egyptian women and very few Bangladeshi women believed this. The desire for an injection of tetanus toxoid was the most common reason in Bangladesh, and this was also important in India. In Egypt, confirmation of pregnancy provided a reason to seek care. In the three sites, a small but significant percentage sought care for a specific problem during the pregnancy. No data are available for Indonesia.

The reasons for not seeking antenatal care (Table 6) also varied widely, although the most common reason given in all sites was that women said they felt fine and care was unnecessary. The next most important reason was financial, which includes the cost of transport as well as the cost of the care itself. Family reasons were much more important in India and Bangladesh than in Egypt — some women were not permitted to attend the clinic, and others were unable to attend because of household duties and child care (but note that although these reasons were given by Indian women who did not seek care, there were very few women in this group). Many women had more than one reason for not seeking care. No data are available for Indonesia.

In summary, antenatal coverage was more extensive in India and Indonesia, and less extensive in Bangladesh and Egypt but for rather different reasons. Egyptian women who did not seek care (37.5%) chose not to do so largely because they did not feel it was important. Bangladeshi women who did not seek antenatal care (13.9%) did not do so primarily because sources were seen as inaccessible and family circumstances made it difficult.

4 Use of Intrapartum Health Care in Index Pregnancy (Tables 7-9)

Except for India, more than three-quarters of women delivered in their own home, and in Bangladesh and Indonesia, a significant proportion delivered in someone else's home, usually their mother's. In India, on the other hand, only 41.5% delivered in their own home, and almost none in anyone else's home. In India, more than half (55%) delivered in government or private hospitals. Looked at in another way, the government provided delivery services to 1% of women in Bangladesh, 4% in Indonesia, 11% in Egypt and 42% in India.

The attendant at delivery is influenced by where the delivery takes place. Most doctors conduct

The Base of the Iceberg: Chapter III

deliveries only in hospitals or private clinics. But Table 8 shows that midwives attend a considerable proportion of births in hospitals and health centers. The exception is Egypt where virtually all hospital births are attended by physicians. Of the four countries in this study, Egypt is also the only place where physicians attend any significant proportion (12%) of home births. Midwives attend a large proportion of births in hospitals and private clinics in India and Indonesia, and a smaller proportion in Bangladesh (private clinics in Bangladesh are the exclusive domain of physicians). Women in Egypt make less use of midwives whose practice is primarily in government health centers and in home deliveries.

As expected, nonmedical birth attendants attend most home deliveries. TBAs are the most commonly used birth attendants in three of the four sites, and a very close second in the fourth site (India). Whether the TBAs had received any training is not specified, but it is likely that some had.⁶ Bangladesh was the only country where family members attended a significant number (38%) of births.

The numbers above refer to the actual place of delivery. Although most women delivered where they planned to, some did not. Table 9 shows that some women planned to deliver in a health facility and did not do so; most often, they delivered at home instead. The reason for the change of plan is not available, but one can speculate that, in the event, the delivery proceeded faster than expected, and/or that transport, funding or child care was not available. Some women planned to deliver at home but, in the event, had an institutional delivery; and we assume that this was because of complications that occurred.

5 Prevalence and Perceptions of Seriousness of Morbidities and Care Seeking Behavior (Tables 10-13)

Obstetric morbidities vary in their *objective* severity and the degree to which they are life-threatening. They also vary in the degree to which they are *subjectively* perceived as serious by the woman herself or by those taking care of her. Importantly, it is this perception of severity that leads to seeking medical attention for the condition (although not necessarily from a provider of western medicine). The next three sections examine how many women reported morbidity in the three phases of the index pregnancy, whether the morbidity was perceived as serious, and whether care was sought. If care was sought, the location where women sought care is examined. Not all of these data are available for Indonesia.

⁶ More than three-fourths of TBAs in Indonesia have received government training, however supervision and refresher training are less than desirable. The same is true for India.

a. Antepartum Morbidity (Tables 10,11)

Prevalent morbidities across all sites were edema (10.3 to 22.9%), severe vomiting (19.2 to 23.3%), and urinary problems (12.3 to 29.4%). Although there was less consistency among the sites for the other morbidities, the range was still quite narrow; exceptions are fever lasting >3 days (which ranged from 4.0% in India to 16.8% in Bangladesh), and hypertension (which ranged from 0.9% in India to 15.6% in Egypt).

Fits or convulsions were rare (0.3 to 3.0%) as expected, except in Indonesia where 7.4% of women reported them.⁷ Antepartum bleeding was rare (2.6 to 4.1%) in three of the four countries as expected; but in India it was even more rare and was reported by only 13 women (0.4%).

Fever lasting more than three days was also rare (1.0 to 5.9%) except in Bangladesh where 16.8% reported this condition; the prevalence of fever is related to the prevalence of both urinary problems (some of which involve infection) and nonobstetric infections. The relatively high prevalence of urinary problems, malaria and jaundice (a proxy for hepatitis) in Bangladesh compared with Egypt and India probably explains the three-fold higher reporting of fever by Bangladeshi women.

Nonobstetric morbidities were most common in Bangladesh where a small, but not insignificant, number of women suffered from jaundice (5.9%), rheumatic heart disease (5.0%), and malaria (3.2%). The prevalence of pulmonary tuberculosis was a fairly constant 0.2 to 0.3% in all three sites. It is important to note that jaundice (if caused by viral hepatitis), rheumatic heart disease, malaria and pulmonary TB are all much more serious in pregnant than in nonpregnant women.

The ability to report hypertension correctly depends on having had blood pressure measured, and measurement of blood pressure is a standard component of antenatal care. Hypertension ranged from 0.9% in India (where almost all women received antenatal care) to 3.6% in Bangladesh (where fewer women got antenatal care) and 15.6% in Egypt where the smallest proportion of women received antenatal care. However this estimate is compatible with another report (Ibrahim et al 1995) which found that 7.8% of 25-34 year old Egyptians had essential

⁷ No term for eclamptic fits exists in the local language. The frequency with which they were reported suggests a wide interpretation of the term.

The Base of the Iceberg: Chapter III

hypertension, and that the percentage was higher for women than for men.

For some morbidities (most notably antepartum bleeding, pregnancy induced hypertension, and varicose veins), the sample of women from India reported a lower prevalence than women at the other sites. While Indian women were also the most likely to seek antenatal care, it is unlikely that antenatal care would lower the prevalence of the conditions.

Table 10 shows the percentage of women who perceived a condition as serious from among those who experienced that condition. Where fewer than 25 women reported the condition, raw numbers are given instead of percentages. Generally speaking, women in the Egyptian sample were more likely to perceive morbidities as serious than women in the Bangladeshi sample; the only exception was severe vomiting, where the percentages were the same.

Of those who did perceive the condition as serious, Egyptian women were also more likely to seek care for it (urinary problems being the only exception). The large majority (more than 75 percent) of women in all four sites sought care for conditions they believed to be serious. For those who did not seek care, the reader is reminded of barriers to antenatal care described above and shown in Table 6. The questions on perception were not asked of Indonesian women. In India so few morbidities were reported that interpretation is difficult.

Table 11 shows the sources of care women used for the various antepartum conditions. The table also shows the percentage of women who did not seek care. This differs from Table 10 which shows the percentage of *only those who perceived the condition as serious* who sought (and conversely did not seek) care.

There were big differences in the main source of care in the four countries. In Bangladesh, by far the most important source of care was "other," which includes traditional practitioners, traditional birth attendants, village doctors, homeopaths, and medical assistants. This category of care was relatively unimportant elsewhere. In Egypt and India the private sector was important; Egyptian women seek care from private doctors, and Indian women from private doctors and private hospitals. In Indonesia, on the other hand, the government health center was the most important source of care.

b. Intrapartum Morbidity (Tables 12, 13)

The physiology of the human female does not differ in the four sites; thus, if other social and environmental factors are also similar, we would expect intrapartum morbidity to occur with similar frequency across sites. Therefore, in interpreting the following section, it is important to remember that the four countries differ significantly in where labor and delivery took place and by whom it was attended. In Bangladesh, almost all (98.4%) women delivered at home (their own or someone else's), half the deliveries were attended by a traditional birth attendant and nearly 40% by a female relative. In Egypt, nearly 80 % delivered at home, but less than 40% were attended

by a TBA; equal proportions (11 %) delivered in a government hospital/clinic or a private hospital/clinic, and 30 % were delivered by a doctor and 17 % by a midwife. In India, on the other hand, only 41.5% delivered at home, 55% delivered in a hospital (government or private); not surprisingly, 61.2% were attended by a doctor or a midwife, and only 35.6% by a TBA. In Indonesia, more than 90% delivered at home (or someone else's home), and more than 90% were attended by a TBA (Table 7). Other things being equal, we might, therefore, expect to see more serious complications of labor and more frequent postpartum complications in Bangladesh and Indonesia than in Egypt and India. This expectation appears to be borne out by Table 12 and Table 23.

1. Prolonged (>18 hours) labor was reported by 6.6%, 3.6%, 1.3% and 5.0% in of the women in Bangladesh, Egypt, India and Indonesia respectively. There are several possible explanations for these differences, and it is difficult to select the more plausible one. First, because women in Egypt and India were more likely to deliver in hospital, they were less likely to have a labor lasting more than 18 hours because of the greater probability of earlier interventions. Second, the differences could be attributable to maternal height and size, but this is unlikely given the racial similarities of Indians and Bangladeshis. Third, there could be differences in defining the length of labor; when is the start of labor — first noticeable contraction, rupture of the amniotic sac, start of hard labor?⁸ The first explanation seems the most likely. The place of delivery also influences the proportion of women who "seek care." A woman who anticipates an uncomplicated delivery in hospital may, in fact, experience a complication; but because she is already in hospital, she has no reason to "seek" care. This must be kept in mind while interpreting this section.

2. Excessive bleeding was the most commonly reported morbidity in two of the four sites (Bangladesh and Indonesia, with 19.6% and 10.5% reporting), and was the second most common in the remaining two sites.⁹ Only 56.7% of Bangladeshi women perceived the problem as serious, and only 70.5% sought care. In Egypt, on the other hand, nearly all Egyptian women perceived it as serious and sought care. The number of women reporting the condition in India is too small to compare, and the question was not asked of the Indonesian sample.

⁸In Egypt, interviewers asked women about the length of labor since the pains became regular. Initially, interviewers had interpreted the question to women as duration of labor since the pain became severe; early analysis showed the mean duration of labor to be <6 hours leading to re-evaluation of the question and retraining the interviewers.

⁹Blood loss is extremely difficult to measure under the best of circumstances, and there could be cultural reasons (such as the means of absorbing the blood loss, towels, etc) why there might be systematic biases.

The Base of the Iceberg: Chapter III

3. Fits/convulsions were reported by 3.3%, 0.1%, 0.2%, and 1.9% in Bangladesh, Egypt, India, and Indonesia respectively. The higher incidence in Bangladesh is consistent with other reports (AbouZahr and Royston). The differences, again, could be attributed to the same three reasons described above (1. prolonged labor), with the same caveats.

4. Loss of consciousness was included in order to identify women with severe morbidities that they were not otherwise able to identify. Women can lose consciousness during labor either because of loss of blood or because of eclamptic fits; there is potential double counting here. No women in Bangladesh reported losing consciousness. In Indonesia, Egypt, and India, the percentages were 3.2%, 2.4%, and 0.9% respectively. Although most women with the condition (85.4% in Egypt and 68.9% in India) perceived the condition as serious, there was a considerable difference in the percentages of women who sought care — 77.3% and 90.0% in Egypt and India respectively. There were probably differences in the way this question was interpreted. For example, if women fainted from exhaustion, they could have reported it as loss of consciousness, but not perceived it as serious or sought care.

5. Fortunately, few ruptured uteri were reported; only in Egypt did women report this condition. A potential difficulty in interpreting this question is that women who did not seek care for a ruptured uterus would not have survived; so perhaps it is the site with the most accessible care which has surviving women with rupture to report. The validity of some reports of ruptured uterus from Egypt must be questioned, as three of the 13 women reporting this condition did not seek care for it; as they survived, it is unlikely they did, in fact, have a ruptured uterus.

6. Vaginal or cervical tears were the most commonly reported condition reported in Egypt and India with 9.9% and 6.4% respectively. Only 1.5% of Bangladeshi women reported tears, and the question was not asked in Indonesia. We would expect fewer tears with a higher frequency of skilled care, but this is not consistent with the pattern of the previous morbidities. None of the Indian women thought the condition serious, perhaps because they were sutured while still in hospital, while 58% and 61% of Bangladeshi and Egyptian women with tears thought they were serious, and most sought care.¹⁰

Table 13 shows where women sought care for these intrapartum complications. The percentage of women receiving some kind of care varied considerably by morbidity and across sites. Notably, the Indian study reported that almost all women received some care for a reported morbidity. This may be at least partly due to the high number of institutional deliveries at this site.

"Other" was the main source of care for Bangladeshi women with intrapartum, as with antepartum, complications. Egyptian women went primarily to government hospitals and to

¹⁰Note that circumcision status was not reported.

private doctors for care. Indian women usually sought care from government hospitals, from private hospitals to a lesser extent, and also made use of "other" providers. Indonesian women went to government health centers and also to the private sector.

Table III.1 Association between the frequency of selected postpartum conditions and the proportion of women receiving skilled intrapartum care.						
Country	Percent delivered in hospital	Percent delivered by doctor or midwife	Number with complication	Number with no complication	Odds Ratio	95% confidence limits
PROLONGED LABOR						
India	55.0	61.2	41	3023	1.00	--
Egypt	12.2	47.5	156	4154	2.77	1.9-4.0
Indonesia	2.3	7.7	96	1795	3.94	2.6-5.4
Bangladesh	1.0	11.1	419	5973	5.17	3.7-7.2
χ^2 for trend	117.1	126.1				
<i>P-value</i>	<0.000	<0.000				
POSTPARTUM BLEEDING						
India	55.0	61.2	55	3009	1.00	--
Egypt	12.2	47.5	153	4157	2.01	1.4-2.6
Indonesia	2.3	7.7	215	1676	7.02	5.1-9.6
Bangladesh	1.0	11.1	1096	5296	11.32	8.5-15.1
χ^2 for trend	450.6	727.5				
<i>P-value</i>	<0.000	<0.000				
FITS OR CONVULSIONS						
India	55.0	61.2	6	3058	1.00	--
Egypt	12.2	47.5	6	4304	0.71	0.2-2.5

The Base of the Iceberg: Chapter III

Indonesia	2.3	7.7	37	1854	10.17	4.1-26.8
Bangladesh	1.0	11.1	224	6168	18.51	8.0-46.1
χ^2 for trend	99.7	186.8				
<i>P</i> -value	<0.000	<0.000				

In addition, in Table III.1, ranking countries in the order of increasing proportion of women with skilled intrapartum care — India, Egypt, Indonesia, Bangladesh — the incidence of three conditions which can be influenced by the quality of intrapartum care is reported, and the test for trend and the odds ratio is shown. The test for trend is significant in each case, suggesting that when a higher proportion of women receive intrapartum care from a medically trained provider, they are less likely to develop one of these three complications.¹¹ The odds ratio means that, compared with women in India, women in each of the other three countries have a higher risk of developing the specified complication.

- Compared with Indian women who are the most likely to deliver in hospital, Egyptian women have nearly three (2.77) times the risk of a labor longer than 18 hours, Indonesian women nearly four (3.94) times, and Bangladeshi women more than five (5.17) times the risk. We assume that this is because women in India are more likely to go to hospital as labor appears to become prolonged or to be already in hospital so that interventions occur sooner. Ranking the sites by the proportion of women with skilled intrapartum care, the percentage reporting labors of more than 18 hours increases in the same order; the χ^2 test for trend shows this to be significant.
- The incidence of excessive bleeding can be reduced by appropriate management of the placenta, and is therefore similar to prolonged labor in that we would expect diminished incidence as the proportion with skilled intrapartum care increases; the incidence was 0.9%, 4.1%, 10.5% and 19.6% (using the same order); the χ^2 test for trend is also significant.
- The role of skilled intrapartum care for eclampsia (fits/convulsions) may be less important as it is not readily predictable. Nevertheless, (and in spite of much smaller numbers) the test for trend was significant.

c. Postpartum Morbidity (Tables 14, 15)

Some postpartum morbidities can be attributed to delivery practices. These include infection and

¹¹There is only one exception to this order; in the case of fits and convulsions, Egyptian women have a lower rate than Indian women, but the hypothesized order is otherwise maintained.

bleeding. Postpartum infection can be caused by unclean delivery practices (inadequate hand washing, unclean surface for mother to lie on); it can also be caused by pathogens present in the vagina before delivery, including some STDs. Postpartum bleeding can occur when the placenta is not appropriately managed (cord tension to remove the placenta, retained placental pieces).

1. Infection. Women were asked about three conditions which could help to identify infection — pelvic pain, high fever and foul discharge. India had the lowest reported rates of each of these, 4.4%, 5.3% and 0.5% respectively. Bangladesh and Egypt had higher rates, 19.0%, 16.5% and 10.2%, and 21.9%, 15.5% and 9.8% respectively. Indonesian women were intermediate with 15.2%, 13.4% and 4.5% respectively.

Overall, Indonesian women reported lower levels of perceived seriousness. Of interest, however, is that the percentage of women who sought care was still quite high. In Bangladesh, on the other hand, with generally higher levels of perceived seriousness, the percentages of women seeking care were generally lower. This probably reflects the relative accessibility of care in the two countries.

2. Excessive postpartum bleeding. Excessive postpartum bleeding was reported by a greater proportion of women in Bangladesh (17.1%) and Indonesia (11.2%) than in Egypt (3.5%) and India (1.8%). This lends support to the hypothesis that management of the placenta by trained professionals results in less postpartum bleeding. Mismanagement of the placenta is a main cause of postpartum hemorrhage.

3. Shock or loss of consciousness. Shock or loss of consciousness (which can be due to blood loss), while rare, was reported more frequently by women in the countries with relatively poor medical services than in those with better services.

Sources of care for women with postpartum morbidities (Table 15) were similar to those for ante- and intrapartum morbidities. This is not surprising as women who received intrapartum care from a trained provider would also be likely to receive postpartum care from the same provider.

d. Long-Term Morbidity (Tables 16, 17)

Many complications of pregnancy are resolved when the pregnancy ends, even if not treated; with a postpartum hemorrhage or an eclamptic fit, for instance, a woman most often either dies or survives without sequelae. Only very rarely are there long term consequences of these conditions.

But other conditions are more likely to cause persistent problems; for instance, postpartum sepsis can result in pelvic inflammatory disease (PID) leading to permanent infertility. Obstructed labors can result in permanent injury to the genitalia leading to such conditions as dyspareunia (painful intercourse), prolapsed uterus, urinary incontinence, or fistulae.¹² Fortunately, these conditions

¹²A fistula is an unnatural opening between the vagina and either the rectum (rectovaginal fistula — RVF) or bladder (vesicovaginal fistula — VVF) caused by tissue necrosis resulting from prolonged pressure during an obstructed labor. Leaking of urine or feces through the vagina can be the result. Either condition may lead to social ostracism. Occasionally, women who have never borne children may develop fistulae, but prolonged labor is the most common cause in developing

The Base of the Iceberg: Chapter III

are relatively rare. We asked women if they had any of these conditions, and if they did, whether it interfered with their daily lives, and whether it affected their relationship with their husbands. We also asked them if they sought care for the conditions.

1. Uterine prolapse. The most common of the long term sequelae of childbirth is uterine prolapse; this occurs when weakened pelvic muscles permit descent of the uterus into the vaginal cavity. This condition was reported by 15.1% of women in Bangladesh, 11.3% in Egypt, 3.3% in India and 16.4% in Indonesia. It should be noted that these are self reports, and that a clinical examination might have revealed a greater proportion of women with the condition. A study in Egypt (Younis et al, 1994) that included clinical examinations found that 56% of women had some degree of uterine prolapse. In addition to the clinical examination (which could diagnose prolapses of lesser severity), the older age of the participants in that study (up to 60 years) could account for the higher prevalence as prolapse can be exacerbated by age. In the present study, at the Egyptian site, all women reporting chronic morbidities, and a sample of women reporting no morbidity were examined. Some degree of prolapse was in 28.8% of women who did not report it (EFCS, 1995)

2. Incontinence. It is not possible to reliably determine by self reports whether incontinence is due to weak pelvic muscles or a VVF, although the former is more likely to produce stress incontinence and the latter a constant dribble of urine. Both can result from obstructed or difficult labors. The condition was reported by 7.7% of women in Bangladesh, 6.2% in Egypt, 3.1% in India and 2.3% in Indonesia.

3. Recto-vaginal fistula (RVF). RVFs in which stool was passed through the vagina were reported only rarely in all four sites (0.1%, 0.2%, 0.0% and 0.2% respectively). But passage of gas was somewhat more common with 5.1%, 1.1%, <0.1% and 0.8% reporting it in Bangladesh, Egypt, India and Indonesia respectively.

4. Dyspareunia and hemorrhoids. Dyspareunia and hemorrhoids were also reported relatively infrequently, as Table 17 shows. It is interesting to note that the number of women reporting that dyspareunia affected their relationship with their husbands — two-thirds of Egyptian women, about half of Indonesian women, one-third of Bangladeshi women, and none of the Indian women — was fewer than expected.

countries. Other causes are genital injuries or radiation therapy.

The likelihood that a woman suffering from some of these conditions sought treatment for them showed surprising little variability. Between 17.0% and 22.7% sought care for incontinence/VVF, and seeking treatment for hemorrhoids ranged only from 46.7% to 61.4%. For dyspareunia, on the other hand, the proportion seeking treatment was 12.5%, 16.4% and 22.7% in Indonesia, India and Bangladesh, but 91.5% in Egypt (where two-thirds of women reported that it affected the marital relationship). In the case of prolapse, India, Bangladesh and Egypt were similar (ranging from 24.3% to 35.2%), but 85.4% of women in Indonesia¹³ sought treatment for this condition. It is apparent that cultural tolerance for some conditions varies considerably. Many women did not seek treatment for these conditions which are, for the most part, treatable. We did not ask whether this was because they were unaware of the possibility of treatment, inability to visit clinics/hospitals, shame, or other reasons. Women who did seek treatment for these long term conditions used similar sources of care for conditions during pregnancy. Government health centers and "other" providers were important sources of care in Bangladesh and Indonesia, and private doctors/clinics in India and Egypt. Women who delivered in hospital may have been less likely to "seek" care because it was provided before discharge.

We asked women whether these long-term morbidities affected their daily lives and their relationships with their husbands, and whether they sought care. Not surprisingly, vesicovaginal fistula or incontinence affected both daily life and the marital relationship, and about one-fifth of women at each site sought care for these conditions. Rectovaginal fistula (whether involving only passage of gas or, more seriously, passage of stool) had slightly less impact, and such women were less likely to seek care. Surprisingly, few women reported that uterine prolapse affected their daily lives, but it did affect the marital relationship; and this was the condition for which women were mostly likely to seek treatment. Women in Bangladesh and Egypt reported that dyspareunia affected their relationships with their husbands; although most (91.5%) women in Egypt sought care, few (22.7%) women in Bangladesh did. In India, although 16.4% of women with dyspareunia reported in the interview that they sought care, none said it affected their relationship with their husband, but during in-depth interviews some women reported that they "put up with it." Only eight women in the Indonesian sample reported this condition.

6. Interventions (Tables 18, 19)

The incidence of interventions largely reflects the place of delivery. Because more women in India (55%) and Egypt (12.2%) delivered in hospital, they were also more likely to have had interventions during labor and delivery. Whether women went to hospital because they were in

¹³ The majority, however, sought care from TBAs (massage) rather than from modern providers.

The Base of the Iceberg: Chapter III

need of intervention, or went for an anticipated normal delivery, cannot be determined from these data.

a. Cesarean Section

In the two countries where hospital deliveries were more common, the incidence of cesarean section was 4.2% (Egypt) and 5.5% (India). Between 5% and 15% is generally regarded as a satisfactory cesarean section rate if it is assumed that sections are appropriately allocated (Maine et al, 1992). In Bangladesh and Indonesia the section rates were 0.2% and 0.7%, and we can only assume that women experienced unnecessary suffering (and possibly death) because of lack of access to cesarean section. Rates of instrumental deliveries (forceps) were similar, and the same comments apply.

b. Episiotomy

Episiotomies were more common — nearly 10% in Egypt and nearly 20% in India — in the sites where hospital deliveries were more common. Nevertheless, tears were reported by 9.9% and 6.4% respectively in these two sites (Table 12). Less than one percent of Bangladeshi women received an episiotomy, but, in spite of this, only 1.5% reported any tear. The possibility of under reporting of tears must be considered.

c. Hysterectomy

Hysterectomies were reported only in Egypt (N=9) and Indonesia (N=15), and ruptured uteri (N=13) were reported only in Egypt. Because hysterectomy is often the treatment of last resort (for example, for ruptured uterus or postpartum hemorrhage), it is no surprise so few were reported.

d. Drugs

Drugs to accelerate delivery can mean properly administered oxytocics, oxytocics improperly administered by medical or nonmedical personnel, or herbal teas administered by traditional practitioners. The use of drugs was most common in India (45.3%), followed by Egypt (41.0%) and Bangladesh (24.2%).

The majority of women in every country except India had no interventions. In India, about half of all women had no intervention. Although there was considerable variation, there were a few women in each country who had multiple interventions; this was highest in India where 20.3% of women had two or more interventions, and lowest in Indonesia where only 0.1% reported two or more. In Indonesia, TBAs often give drugs (herbal infusions) to accelerate labor; as respondents were not asked about this, however, the use of interventions appears lower than it really is.

Table 20 shows whether women with specific morbidities received any interventions. Note that interventions are used to manage obstetric complications, but can also cause other problems. For instance, women who deliver by cesarean section are more likely to experience heavy bleeding. In India, 18.5% of women with excessive bleeding had delivered by cesarean section.

Table 20 shows that even some women without morbidity were distressingly likely to have been given drugs; this is especially true in Bangladesh where almost all women were delivered at home by a relative or a TBA. We do not know the nature of the drugs given. In both Egypt and

The Base of the Iceberg: Chapter III

India, where there were more institutional deliveries, 4.0% and 3.6% of women with no morbidity were delivered by cesarean section.¹⁴

7. *Outcome of Pregnancy* (Tables 20-22)

The stillbirth rate was 1.4% in India, 2.3% in Indonesia, 3.8% in Bangladesh and 5.6% in Egypt. Several morbidities influenced the outcome of pregnancy (Table 20).

a. Antepartum Morbidity (Table 20)

In each country, antepartum bleeding was associated with perinatal loss. In Egypt 16.1% of women with antepartum bleeding suffered perinatal loss, the corresponding numbers in Bangladesh and Indonesia were 13.3% and 8.2%. In India, there were too few cases to calculate a percentage. No other antepartum condition consistently lead to an increase in perinatal loss.

b. Intrapartum morbidity (Table 21)

In Bangladesh, both prolonged labor and fits or convulsions were associated with an increased risk of stillbirth, but this was (surprisingly) not the case in the other three sites. Egypt was the only site to report ruptured uteri, and three of these 13 mothers lost their babies. In all sites but India, interventions (cesarean section, instrumental delivery, hysterectomy) were associated with increased risk of pregnancy loss. Because of the high rate of hospital deliveries in India, it is assumed that the interventions were timely and avoided perinatal loss, whereas in the other sites it is assumed that interventions occurred too late, in some cases, to save the baby.

c. Postpartum Morbidity (Table 22)

Postpartum morbidity does not contribute to perinatal loss, but the same conditions that lead to the morbidity often contributed to the loss of the baby as well.

8. *Induced Abortions and Miscarriages* (data not shown)

The responses to questions on abortion were disappointing in terms of the likely completeness of

¹⁴These could have been repeat cesareans (i.e. the previous delivery was by cesarean) which we have not defined as a morbidity.

the reporting; we have, therefore, not shown them. Only 23 women in Bangladesh, 106 in Egypt and 9 in Indonesia reported ever having had an induced abortion. Only 10% in Bangladesh and Indonesia reported ever having had a miscarriage. Four percent of Egyptian women, 1.2% of Bangladeshi women and 2.0% of Indonesian women reported that the index pregnancy ended in a miscarriage. Both of these estimates are far below the number who might be expected to have experienced a recognizable miscarriage. However, close to half of Egyptian women reported having at least one miscarriage, which is consistent with the number who might be expected to have experienced a recognizable spontaneous abortion. Many women reported that they sought medical treatment for the pain and bleeding associated with the previous miscarriages — 55.1% in Bangladesh, 81.4% in Egypt and 83.3% in Indonesia.

In India, on the other hand, the question was asked only of the index pregnancy; 132 women reported having had an induced abortion. Because the vast majority (94%) were induced by a physician, few complications were reported. Nearly 20 percent (18.2%) of women in the Indian sample reported that the index pregnancy ended in a miscarriage, which is consistent with the expected number of recognizable miscarriages. Most (95%) reported morbidity associated with the miscarriage and 72% of these women sought treatment. Twenty-seven percent were admitted to hospital (mean number of nights of hospitalization was 2.9) for treatment of these complications. A similar percentage was hospitalized for management of induced abortion complications and the average hospital stay was similar. It is important to note, however, that some of women may have been hospitalized for the induction itself. Information on gestational age at induction was not asked for.

9. *Impact of Morbidity on Fertility Desires* (data not shown)

Between 20 and 40 percent of mothers wanted to have additional children, and this was affected surprisingly little by having experienced morbidity. Mothers with long-term morbidity were less likely to want additional children, but the difference was not great. Mothers who had experienced life-threatening or serious morbidities, in every site, were *more* likely to want additional children, perhaps because they were more likely to be primiparae.

IV. PREVALENCE OF MORBIDITIES

This chapter examines the overall prevalence of pregnancy-related morbidity among these four samples of women. We look at both the number of morbidities reported, and the percentage of women who reported morbidity. We also examine the severity of the morbidities reported.

Whether a morbidity is appropriately treated sometimes affects its severity (whether it progresses to become an actual life-threatening condition rather than only potentially life-threatening). We were not able to assess whether conditions were actually life-threatening, only that they were potentially life-threatening.

In comparing the frequency of morbidity in the different time periods of pregnancy (ante-, intra- and postpartum), it is important to remember that morbidity tends to be more common during pregnancy than during delivery or the postpartum period, and this is partly because of the different durations of the three time periods — nine months (antepartum), typically about 12-24 hours (intrapartum), and six weeks (postpartum). Some conditions, especially nonobstetric conditions such as pulmonary TB, may be influenced by the sociocultural setting and might be expected to be more common in countries where they are prevalent in the general population, and especially among women of lower socioeconomic status.

Some conditions may persist for the duration, these include the nonobstetric conditions mentioned above, as well as some obstetric morbidities such as pregnancy-induced hypertension. Study participants were asked about conditions occurring in each of the three time periods, but a continuing condition is recorded only once.

In addition, there are conditions — some treatable, some less so — which persist beyond the end of the postpartum period, and may last the rest of a woman's life. Some morbidities result in truly tragic situations for the women who suffer from them. These are not always caused by the index pregnancy, and they may be cumulative. Study participants were asked about such conditions and how long they had had them.

A. During the Index Pregnancy (Table 23)

The questionnaire asked women whether they had experienced specific morbidities in each of the three pregnancy-related periods. The specific morbidities asked about, and their severity, are shown in Table IV.1. Long-term morbidities are covered separately below.

Because the Indonesian study was part of a longitudinal study, we were not able to collect data on morbidities occurring antepartum;¹⁵ and not all types of intra- and postpartum conditions were covered in the questionnaire. Limited data on antepartum morbidities were collected during the earlier prospective study. Where conditions are covered they are included; and where there are no data, this fact is noted.

Table IV.1. Specific morbidities of the index pregnancy covered in questionnaire.¹⁶		
Antepartum	Intrapartum	Postpartum
Life-threatening		
Malaria Hemorrhage Fits/convulsions	Malaria Hemorrhage Fits/convulsions Ruptured uterus	Malaria Hemorrhage Fits/convulsions
Serious		
Edema (hands & face) Hypertension Fever >3 days Severe vomiting Jaundice Pulmonary TB	Labor >18 hours Vaginal or cervical tear	Fever >3 days Foul discharge Shock/loss of consciousness
Other		
Rheumatic heart disease Varicose veins Burning on urination		Pelvic pain Painful urination Breast conditions Depression <2 weeks

¹⁵The antepartum data collected during the earlier study were more limited than the intra- and postpartum data. Where possible, however, we have made use of them.

¹⁶Refers to Tables 10, 12, 14.

Frequent urination		Depression \geq 2 weeks
--------------------	--	---------------------------

The prevalence of morbidity was far higher than anticipated. In fact, most women reported at least one morbidity at some point during the index pregnancy and puerperium. Among women in the Indian sample, 58.3% experienced at least one morbidity, the corresponding numbers were 66.9% in Egypt and 79.9% in Bangladesh.¹⁷ Many women reported more than one (Table 23); 1.8% of Indian women, 10.1% of Egyptian women and 23.7% of Bangladeshi women reported five or more separate morbidities. Not all, of course, were serious or life-threatening. A life-threatening morbidity was reported by 4.7% of women in the Indian sample, 10.7% of the Egyptian sample and 32% of the Bangladeshi sample. But quite a large proportion of women reported experiencing serious morbidities; life-threatening or serious morbidities were reported by 45.5% of Indian women, 55.1% of Egyptian women and 65.1% of Bangladeshi women.

1. Antepartum Morbidity (Tables 10, 23)

Although antepartum morbidity was quite common, few women had serious morbidities and even fewer had life-threatening ones. Sixty percent of Indian women, 49.8% of the Egyptian women, and 42.6% of Bangladeshi women reported no morbidity at all during their pregnancies. Although half of the women in the Egyptian sample had at least one morbidity during pregnancy, most of these (28.0%) had only one, 14.8% had two, and 7.4% had more than two. The figures were quite similar in India (23.0% had only one, 12.0% had two and 4.6% had more than two) and Bangladesh (24.3% had only one, 16.5% had two and 16.4% had more than two).

Life-threatening complications during pregnancy were defined as antepartum hemorrhage, convulsions and malaria. Table 23 shows that few women experienced such extreme conditions, 1.2% of women in the Indian sample had one such condition and none reported more than one; 4.9% of women in the Egyptian sample had one, and 0.1% had two such conditions; in Bangladesh, the corresponding numbers were 6.9% and 0.9%, and in Indonesia 4.2% and 0.

Serious morbidities of pregnancy are defined as edema, hypertension (that was measured), fever lasting longer than 3 days, severe vomiting, jaundice, and pulmonary TB. Between 20 and 30 percent of women in the four sites suffered from either a serious or a life-threatening condition: 20.8% in India, 17.9% in Indonesia, 27% in Bangladesh, and 29.3% in Egypt. Some women had more than one such condition, 4.6% in India, 15.0% in Egypt and 20.3% in Bangladesh.

Table 10 shows the prevalence of specific conditions in the three sites.

¹⁷Data are not available for Indonesia.

2. Intrapartum Morbidity (Tables 12, 23)

Far fewer women reported intrapartum morbidity than reported antepartum, nevertheless a significant proportion did experience serious or life-threatening complications during delivery (Table 12). More than 70% of women in all the samples reported no complications of delivery: 83.6% in India, 82.2% of Egyptian women, and 73.4% of Bangladeshi women. Note that we asked about new conditions that are specific to the (short) period of time that defines labor and delivery. Continuing conditions (such as hypertension, TB) will also complicate the intrapartum period, but are not recorded separately. Because of the inherently brief duration of the intrapartum period, new conditions that are not strictly obstetric are unlikely to occur.

Life-threatening complications during labor and delivery were defined as intrapartum hemorrhage, ruptured uterus, convulsions and malaria. Few women experienced such extreme conditions, 1.8% of women in the Indian sample had one such condition and none had more than one; 4.4% of women in the Egyptian sample had one, and <0.1% had two such conditions; but in Bangladesh and Indonesia, the corresponding numbers were higher at 19.9% and 1.5%, and 16.1% and 0.7% respectively.

Serious morbidities of labor and delivery are defined as labor longer than 18 hours, or vaginal or cervical tear. Between 7% and 22% of women suffered from one serious or life-threatening condition: 13.0% in India, 7.3% in Egypt, 18.3% in Indonesia and 22.1% in Bangladesh. A very few women had more than one such condition, 0.6% in Egypt, 0.7% in Indonesia, 3.1% in India, and 4.1% in Bangladesh.

Table 12 shows the specific morbidities.

3. Postpartum Morbidity (Tables 14, 23)

Postpartum morbidity was quite common with one-quarter to two-thirds of all women reporting morbidity in the postpartum period. In India, 23.5% of women reported any morbidity; the corresponding number in Egypt was 45.6%, and in Bangladesh was 65.2%. Few life-threatening complications in the postpartum period (defined as malaria, hemorrhage or fits) were reported by Indian (1.9%) or Egyptian (3.8%) women. But in Bangladesh and Indonesia, 18.4% and 11.3% respectively of women reported life-threatening complications in the postpartum period. Serious (defined as shock, fever lasting more than 3 days and foul discharge) and life-threatening morbidities combined were reported by 15.9% of the Indian, 23.1% of the Indonesian, 24.4% of the Egyptian and 37.3% of the Bangladeshi samples.

B. Long-term Morbidity (Tables 16, 24)

Many complications of pregnancy and delivery, even those that are serious or life-threatening, are resolved relatively quickly and have no long-term consequences. Nevertheless, there are some

The Base of the Iceberg: Chapter IV

long term sequelae which may have severe medical and social consequences for women who suffer from them. We collected data on only six long term morbidities; we chose these six because they are often symptomatic, making it possible for respondents to detect and report them without a clinical examination (Table 16). The six were vesicovaginal and rectovaginal fistulae, incontinence, uterine prolapse, dyspareunia and hemorrhoids. Women with fistulae or other forms of incontinence often become social outcasts, abandoned by their husbands and families. Uterine prolapse and dyspareunia can jeopardize the marital relationship, and prolapse and hemorrhoids can be debilitating conditions.

Long-term morbidity was reported by 28.6% of the women in the Bangladeshi sample, 25.5% of Egyptian women, 8.2% of Indian women, and 19.7% of Indonesian women. A few women (<7%) in every site reported more than one such sequelae of childbirth. These chronic problems could have been caused by pregnancies preceding the index pregnancies through which women were selected into these samples. However, because several of these conditions undoubtedly reduce coital frequency or may terminate sexual relations altogether, these estimates should be considered conservative. A reticence to discuss such matters would also lead to a conservative estimate.

C. Discussion

Given the social, cultural and racial diversity of the four study sites, the consistency of the findings is somewhat surprising. The percentage of women with any morbidity during the pregnancy and puerperium ranged from 58.3% in India to 79.9% in Bangladesh. The

Table IV.2. Prevalence of morbidities during the index pregnancy.				
	Bangladesh	Egypt	India	Indonesia
Antepartum	57.4	50.2	40.0	not available
Intrapartum	26.6	17.8	16.4	not available
Postpartum	65.2	45.6	23.5	not available
Anytime	79.9	66.9	58.3	not available

Source: Based on Table 23.

obvious question to raise is whether different definitions of morbidities were used. Considerable effort was expended to make definitions as similar as possible; investigators met on a regular basis

to develop consensus on definitions, wording and interpretations. Nevertheless, discrepancies may have crept in through the use of particular translations, and the possibility that morbidities were overstated in Bangladesh and/or understated in India must be considered. Alternative explanations are that more extensive intrapartum care in India (and in Egypt to a lesser extent) accounts for fewer intra- and postpartum morbidities, or that the lower parity and age of the Indian sample results in fewer morbidities. Regardless of the reason for the findings, and even if 58.3% prevalence of obstetric morbidity in India is an understatement, it is still a far larger number than anticipated, and should be interpreted in that context.

V. RATIO OF MORBIDITIES TO MORTALITY

A primary objective of this study was to develop a new estimate of the number of morbidities for each maternal mortality. An early estimate from India was 16.5 morbidities per mortality, but there were a number of characteristics of this estimate that were less than satisfactory. Nevertheless, this number is often used to estimate the number of maternal morbidities in a population. Thus, it is useful to replicate the analysis and to determine whether the number applies in different settings. The present research estimates two morbidity/mortality ratios; first, for the *number* of morbidities (Table 25) in the three time periods of pregnancy, and second, for *women* (Table 26) with morbidities in the three periods.¹⁸

The morbidity/mortality ratio is influenced by the level of maternal mortality as well as by the level of maternal morbidity. The estimates of the maternal mortality that we used are shown in the table below. Two countries (Egypt and India) have a level of maternal mortality that is about half that of the other two. Clearly, this influences the morbidity/mortality ratio because it halves the denominator thus increasing the quotient.

A. Number of Morbidities per Mortality in the Index Pregnancy (Table 25)

Looking first at morbidities of the index pregnancy regardless of their timing or severity, we find 643 morbidities per mortality in Bangladesh, 967 in Egypt and 541 in India. Limiting the analysis to serious or life-threatening morbidities, we find 149, 259, 300 and 591 for Indonesia,¹⁹ Bangladesh, India and Egypt respectively; and for life-threatening morbidities only the ratios are 112, 114, 24 and 67 respectively.

These estimates leave us with several issues of interpretation. Egypt and India have lower levels of mortality; therefore, other things being equal, these sites should have higher ratios of morbidity

¹⁸ That is, for "number," one woman can contribute multiple morbidities, whereas for "women," women with multiple morbidities are counted only once.

¹⁹ Recall that Indonesia reported data on only a limited number of types of antepartum conditions.

to mortality (because the denominators are smaller). While this appears true for Egypt, India also reports lower levels of morbidity than the other sites, and a lesser tendency to classify them as life-threatening.

Table V.1. Estimates of maternal mortality ratios used in calculations.		
Country	Estimate of maternal mortality ratio²⁰	Source
Bangladesh	460	Statistical Pocketbook of Bangladesh 1994, Bangladesh Bureau of Statistics, Statistical Division, Ministry of Planning, Government of the Peoples Republic of Bangladesh (page 105)
Egypt	190	Fortney (1987), Saleh (1987)
India	240	DANIDA Terminal Evaluation, 1990
Indonesia	450	National Bureau of Statistics

B. Number of Women with Morbidities per Mortality in the Index Pregnancy (Table 26)

Turning now to the number of *women with morbidities* per maternal mortality, the ratio is, of course, smaller. In Bangladesh, 186 women experienced a morbidity (without regard to the severity and timing of the morbidity) for every woman who died a maternal death; in Egypt and in India, the numbers were 374 and 251, respectively.²¹ If we restrict the analysis to life-threatening

²⁰ WHO and UNICEF's new estimates of maternal mortality per 100,000 live births (with 95% confidence limits for these countries are: Bangladesh 850 (595 - 1139); Egypt, no change; India 572 (435 - 738); Indonesia 647 (452 - 895). Source: *Revised 1990 Estimates of Maternal Mortality: A New Approach by WHO and UNICEF*. World Health Organization, Geneva, April 1996. These are national estimates; the estimates above for Egypt and India are specific to the area of the study.

²¹ Data are not available for Indonesia.

complications, 72 women in Bangladesh, compared with 56 in Egypt and 20 in India had a life-threatening complication for every woman who died.

C. Number of Women with Chronic Morbidities per Mortality (Table 26)

For every woman who died from pregnancy-related causes there are 64.6, 134.2 and 24.5 women with chronic morbidity associated with pregnancy in Bangladesh, Egypt and India respectively.

The Base of the Iceberg: Chapter V

D. Discussion

If we take into account differences of definitions, populations and sample selection procedures, the findings in this report are largely compatible with those of similar studies. The exception is the earliest study (Datta et al, 1980), and it is, perhaps, unfortunate that because it was for so long the only source of data, many assumptions were based on it, causing an underestimation of the burden of maternal morbidity. We compare, below, our findings with those of other studies.

Datta and his colleagues (1980) conducted a five-year prospective study; households were interviewed once a month and any ailment of a pregnant woman reported by her or her family or observed by the interviewer was recorded. Three hundred and forty-nine pregnancies in 281 women were observed. The reported maternal mortality ratio was 592 per 100,000 live births, although this was based on only two deaths (from postpartum hemorrhage). There were 116 new sicknesses reported during the period (0.33 per pregnancy), of which 28.45% (N=33) were pregnancy related (0.08 per pregnancy). Looking first at the morbidity/mortality ratio (all sicknesses $116/2 = 58$; pregnancy-related $33/2 = 16.5$), clearly the ratio is very dependent on an estimate of maternal mortality that is not very robust, based, as it is, on two deaths in a five-year period. Had there been one more, or one fewer deaths, the ratios would have been 116 or 39, and 33 or 11 respectively. Datta found that 6.8% of women reported an illness in the antenatal period.

A study by the US Centers for Disease Control (Franks et al, 1992) found that for every 100 hospitalizations for delivery, there are 22.2 *for complications during pregnancy* (14.6 for pregnancy complications and 7.6 for pregnancy loss²²). If we argue that what our study defined as life-threatening or serious complications equates to hospitalizations for antepartum conditions (excluding pregnancy loss) in the CDC study, then CDC estimate of 14.6 can be compared with the following figures from our study (the figures in parentheses are for life-threatening antepartum complications): Bangladesh 157 (50) per 100 births; Egypt 101 (13) per 100 births; and India 63 (5) per 100 births; the data for Indonesia were not calculated.

The findings from a different CDC study done in collaboration with the Asociación Demográfica Salvadoreña (ADS) in El Salvador, as well as those from two other studies similar to ours are compared with our studies in Table V.2.

²²But not for induced abortion

The DHS study in the Philippines by Stewart and Festin (1995) reported that 10.9% of women had life-threatening complications in the peripartum period.²³ If we compare this with the incidence of life-threatening complications in the intrapartum period in our study, we find 21.4% in Bangladesh, 4.4% in Egypt, 1.8% in India, and 16.8% in Indonesia. Although we cannot construct a peripartum period for our data, our data appear to be compatible with the data from the Philippines.

Bhatia and Cleland (1996) reported that 41% of women in a study in south India had at least one morbidity associated with their last pregnancy. The comparable figures from our study are 80%, 67% and 58% for Bangladesh, Egypt and India respectively. The same study reported that 18% of women had antepartum complications compared with 57%, 50% and 40% (Bangladesh, Egypt, India); and 23% had postpartum morbidity compared with our 65%, 46% and 24% in Bangladesh, Egypt and India. The figures are not available for Indonesia.

Part of the present study in Egypt involved referral and examination of women reporting long-term morbidities.²⁴ In addition a sample of women who reported no long-term sequelae were examined. The specificity of all conditions was good — better than 90% for all conditions except prolapse (28.8% of women who did not report prolapse had some degree of uterine prolapse on physical examination). Table V.3 shows the results of the examination for the two groups of women, and a comparison of the prevalence reported in Table 16 with the corrected prevalence. In all cases except recto-vaginal fistula (RVF), the prevalence of the condition was higher among those who reported it than among those who did not. Two of the conditions (dyspareunia and stress incontinence) cannot be detected by physical examination, but accurate assessment depends on the woman to report correctly; so the fact that more women reported the condition to the doctor examining them suggests that sensitive questioning in private can elicit more positive responses. But which approach is the more valid remains unresolved. One condition (prolapse) is not easily detected by the woman herself in its early stages, so it is to be expected that examination would find the condition more frequently than self-reports.

In spite of these findings, the self-reported prevalence is a reasonable estimated of prevalence found on examination for three of the five conditions, and is an underestimate for two of them (prolapse and dyspareunia).

²³Not well defined, but usually the intrapartum plus early postpartum periods.

²⁴In all study sites women who reported continuing morbidity were referred for treatment; in Egypt, however, women were followed and the results of the examination were recorded.

The implication of these findings is that questionnaire design continues to need refinement, and pretesting of questionnaires on women known to have specific conditions is desirable.

Table V.2. Comparison of the present study with other studies, incidence per 100 deliveries.							
Complication	El Salvador ADC & CDC 1994	India Bhatia & Cleland 1996	Philippines Stewart & Festin 1995	Bangladesh Present Study	Egypt Present Study	India Present Study	Indonesia Present Study
Edema*	35	4.3	n.a.	22.9	12.8	12.6	10.3
Hypertension	14	3.8	n.a.	3.6	15.6	0.2	not avail.
Antepartum bleeding	6.3	0.9	22.1	2.6	4.1	0.4	3.2
Prolonged labor**	15	20.4	15.2	6.6	3.6	1.3	5.0
Intrapartum bleeding	28.6	1.3	7.9	56.7	4.1	0.9	10.5
Convulsions***	1.8	0.3	1.6	3.5	0.1	0.2	1.9

* Edema of legs and/or face in El Salvador, hands and/or face elsewhere.

** More than 24 hours in El Salvador, more than 12 hours in the Philippines, more than 18 elsewhere.

*** In the peripartum period in El Salvador, intrapartum only elsewhere.

Table V.3. Egyptian study results of physical examination of women reporting specific morbidities.				
Long-term morbidity	Prevalence (%) among women NOT reporting condition N = 757	Prevalence (%) among women reporting condition N = 489	Prevalence (%) in total sample	
			Table 16	Corrected
Stress incontinence or VVF	9.5	17.4	6.2	10.0
RVF	0.2	0.0	0.2	0.2
Prolapse	28.8	48.7	11.3	31.0
Dyspareunia	9.7	18.5	2.1	18.3
Hemorrhoids	7.9	30.4	12.5	10.7

Source: EFCS. Study of the Prevalence and Perception of Maternal Morbidity in Menoufeya Governorate, Egypt. September 1995.

VI. IMPLICATIONS FOR PROGRAMS

To develop effective interventions to enhance the utilization of maternity services, we need to know whether women recognize the symptoms of conditions for which treatment should be sought, and whether they know that the condition can and should be treated. One purpose of this study was to determine whether women understood the severity of conditions they experienced and whether they sought medical help for morbidities of pregnancy, delivery and the puerperium. There are several reasons for not seeking medical attention:

- the morbidity was not recognized
- the morbidity was not seen as serious
- the morbidity was recognized as serious (and needing medical attention is implied), but medical attention was not sought.

Each of these situations requires a different kind of intervention to increase use of services. The survey addressed only the second and third of these. The first we cannot address because unrecognized morbidities could not be reported to our interviewers.

A. Knowledge of Complications

1. *Antepartum Morbidities* (Table 10)

In each of the three countries for which we have data,²⁵ even for very serious conditions like antepartum bleeding, convulsions or fever lasting more than three days, there was a significant proportion of women who did not perceive the morbidities as serious. Of course, not all of the potentially serious conditions actually became serious, so we would expect some to be perceived as not serious.

²⁵Indonesia did not ask questions about perceptions of severity, or seeking care for specific complications.

This was especially a problem in Bangladesh where more than 40% of women with antepartum bleeding did not perceive it as potentially serious, and 14% of women with fits/convulsions did not perceive them as serious. This leads us to recommend interventions that would educate women and their families to recognize and respond to antepartum symptoms of potentially serious and even life-threatening conditions. Because most antenatal care in Bangladesh takes place in the home through the work of health visitors, such interventions need to involve health visitors who can ask about relevant symptoms at each visit and use the opportunity to explain why the questions are asked. Women in Bangladesh are often secluded and most are also illiterate. Therefore, consideration must also be given to targeting such information at men through mosques or other places where men assemble.

Recognition of severity varied among the sites, and was limited for some morbidities. For example, although women in India were generally more likely than women in the other sites to seek care, doing so for fever was an exception. A possible explanation is that the Indian sample consisted of different and overlapping groups of women; urban and rural, with and without antenatal care, planning and not planning institutional delivery. Rural women, however, were no less likely to recognize severity of antepartum conditions

In Egypt, there was widespread recognition of the severity of conditions; for example, almost 94% of women with antepartum bleeding recognized that it was potentially serious. However, a desirable goal would be to make this knowledge universal. Because television and radio reach a very high percentage of Egyptian homes, this could be the most effective way to bring about universal recognition of the symptoms of serious conditions of pregnancy.

2. *Intrapartum Morbidities* (Table 12)

Recognition of the severity of intrapartum morbidities was not greater than for antepartum conditions. In particular, excessive bleeding in Bangladesh and India was perceived as serious by only slightly more than half of the women experiencing it. Yet excessive bleeding is a leading cause of maternal death in both sites. The failure to recognize it is more serious in Bangladesh than in India, however, as almost all women deliver at home in Bangladesh.

In Bangladesh, more than 85% recognized the severity of prolonged labor and fits or convulsions, but less than 60% recognized the potential importance of bleeding or tears. Thus, health education interventions should reinforce the importance of the former, and re-educate on the latter. In Egypt, there was broader (80% or more) recognition of the severity of all conditions except tears (61.4%); while tears are often not life-threatening, they can be a source of great discomfort, and can invite infection. In India, prolonged labor and fits were well recognized as potentially serious complications of labor.

3. Postpartum Morbidities (Table 14)

In spite of the fact that the majority of maternal deaths take place in the postpartum period, perception of postpartum morbidities as serious was not as widespread as it should be. Again, generally speaking, Egyptian women were more likely to recognize the severity of conditions than women in Bangladesh or India; and the more serious conditions were more often identified as such. Fits/convulsions was recognized more often (78% or more) than bleeding (60% or more), shock or loss of consciousness (58% or more), or foul discharge (45% or more). Indonesian women, on the other hand, were significantly less likely than women in the other three sites to recognize the importance of all of the conditions, and the percentage who did so is well below the numbers cited above.

Health education, by whatever means, should be aimed at informing pregnant and postpartum women of the potential importance of pelvic pain, foul discharge and fever (especially in combination), and that the potential for significant blood loss is great when bleeding continues for some time even if the amount does not appear excessive.

Indonesia represents a special case in that recognition of the importance of symptoms was much lower than that of the other three sites. The need for education before or during pregnancy of the importance of symptom recognition is, therefore, much greater in Indonesia.

It is well recognized that to reduce maternal mortality and sequelae of morbidities women must be treated for morbidities that arise. Women cannot seek treatment if they and their families do not recognize the symptoms or, recognizing them, do not believe they are serious. And treatment cannot be effective if women do not seek it for whatever reason.²⁶ Health education — providing women and their families with the information they need to make decisions about when (and how) to seek care — is a crucial element of interventions to reduce maternal death and disability. But it must also be noted that knowledge of intrapartum complications is far less crucial in a setting where the rate of institutional deliveries is high, assuming that women delivering in hospital will be appropriately cared for regardless of their own knowledge.

While information is necessary to seeking care appropriately, it is, unfortunately, not sufficient. In addition, changes in attitude are sometimes necessary. Attitudes present in some cultures that present barriers to seeking care for obstetric problems include: women are supposed to suffer during delivery, women are not worthy of the necessary time or money, discussion of women's problems is embarrassing (or even taboo), and women can't make decisions about their health

²⁶Note that we are assuming that treatment, when given, is effective. The quality of maternity services was not addressed in this study.

care.

B. Access to Care

1. Antepartum Morbidities (Tables 6, 10, 11)

Table 11 shows that a large percentage of women sought no care for many antepartum conditions, and even when the condition was perceived as serious, many did not seek care (Table 10). We did not ask the reason for not seeking care, but Table 6 gives some insight into this question and suggests that accessibility and cost are reasons. It is also worth noting that in Bangladesh, where the problem is greatest, women are secluded; greater access to women providers might increase the proportion of women who seek care.

2. Intrapartum Morbidities (Tables 12, 13)

Table 13 shows that women were more likely to seek care for intrapartum complications than those that occurred during the pregnancy. In both India and Indonesia, the proportion receiving no care for intrapartum complications was negligible. In Indonesia, much of the care was provided by TBAs rather than by modern medical providers. Given the frequency of antenatal care in India, it is difficult to understand why women with some complications (edema and urinary complications) did not receive treatment for them. In Bangladesh, nearly 60% of women with excessive bleeding received no care, and in Egypt 30% of women with prolonged labor received no care. Even among women who perceived the condition as serious (Table 12), some still sought no care; for example nearly 20% of Egyptian women with prolonged labor *and* who knew it was serious, did not seek care.

It is important to recall that accessibility to care varies among the countries. In Egypt, there are few geographic barriers impeding access to care, and while roads vary in quality and vehicles are sometimes in short supply, the majority of the population live within reasonable distance of a hospital. Bangladesh, on the other hand, is a country dominated by rivers, so in addition to the seclusion of women mentioned earlier, transportation to hospital can be severely impeded by water barriers and limited access to ferries. In India, although the sample was drawn from the catchment area of the JIPMER teaching hospital, some women lived relatively further away from the hospital.

Interventions in Bangladesh for intrapartum complications might, therefore, focus on improving access by improving transportation and by increasing the number of female care providers who can provide emergency obstetric care in the home, and this has been tried with some success (Fauveau et al, 1991).

In both Egypt and India, financial barriers to antenatal care were reported (Table 6). There are many ways to deal with these obstacles, including local insurance plans, delayed payment, and

The Base of the Iceberg: Chapter VI

reducing or waiving fees for some patients. Improving access to transportation in Egypt and India might improve utilization in the event of emergency. Although in the Indian site the percentage of institutional deliveries is quite high, there is limited use of Primary Health Centers (PHCs) for this purpose and many women, even from rural areas, go to tertiary government hospitals or private facilities for delivery. There is a need to upgrade the PHCs so that they can provide essential obstetric care. This would reduce travel time, cost of care, and overcrowding in hospitals.²⁷

In Egypt, some TBAs have developed working relationships with physicians and, in some cases, continue to attend their patients after referring them to private clinics. This partnership almost certainly increases the proportion of women (and their families) who are willing to seek a higher level of treatment.

3. *Postpartum Morbidities* (Tables 14, 15)

As with earlier morbidities, many women received no care, even when they knew the condition was potentially serious. And as with the morbidities occurring earlier in pregnancy, Egyptian women were more likely to seek care than women in Bangladesh or India. Postpartum care receives less research attention than antepartum or intrapartum care, in spite of the fact that this is the period where the majority of deaths occur. While it is recognized that good intrapartum care reduces the number of postpartum complications, it is still important to recognize and treat conditions that occur in the puerperium. Countries with systems of health visitors are in a position to train health visitors to look for symptoms of postpartum problems, many of which can be managed below the level of hospital. Much of the attention of health providers in the postpartum period is focused on the infant, and not enough on the mother.

C. Discussion

This survey has confirmed that there are two entirely distinct types of interventions that would improve the management of maternal morbidities.

The first is improving the knowledge of women and their families about the symptoms that require attention during pregnancy, labor, delivery and the postpartum period. There are any number of

²⁷This has been addressed to some extent by programs such as Child Survival and Safe Motherhood, and the Safety Net Scheme in India.

ways to accomplish this in a variety of cultural settings, and no single way predominates. Considerable attention in the literature has been devoted to this aspect of the solution.

The second is to enable women and their families to avail themselves of health facilities that exist. Barriers include geographic, financial, cultural and psychic, and the magnitude of the barriers varies considerably. Some barriers can be nearly impossible to overcome (great distances or mountains, for example), others can be easily overcome if the desire genuinely exists (such as permitting flexibility in some birthing practices, or payment schedules). The increasing role of the private sector in some countries may improve access; hours of service are often more flexible in private clinics than in the public sector.

A third intervention, improving the quality of maternity care at all levels of service and in all stages of pregnancy and the puerperium, was not addressed by this study. Even though we did not address this issue, it is essential to recognize that people, including pregnant and laboring women, are more likely to seek the care they perceive to be effective.

The challenge, then, for safe motherhood programs is to provide both the knowledge and the means to act on the knowledge. Communities have shown themselves to be creative in finding ways to act once they have the knowledge (Maine et al, 1993) and programs should reward and facilitate such creativity.

EPILOGUE

A great deal of epidemiologic research relies on gathering correct information from respondents. But this information usually has to do with the respondents' recollections of events that might be related to their disease rather than with the diagnosis of the disease itself. Research in maternal morbidity shares with other areas of epidemiologic research the problem of detection bias. Detection refers to the variation in the likelihood that a condition will be diagnosed. There is, for most diseases, considerable variation in the likelihood of detection — HIV, *in situ* cervical cancer, diabetes are all good examples. What is special about research in maternal morbidity, at least at this stage in its evolution, is that we still depend on respondents to identify many of their conditions rather than a laboratory test or other technology.

Since this research was completed, research to validate the use of household surveys for the purpose of estimating prevalence of obstetric morbidity has been completed. There are now six studies — in the Philippines, Benin, Ghana, Indonesia, Bolivia and El Salvador. At the time of writing (December 1996), only the study from the Philippines has been published (Stewart and Festin, 1995). The results of the other studies are not yet available.

In general, these studies used different techniques to validate the findings from questionnaire-based studies, and measured the sensitivity and specificity of questionnaires to identify specific maternal complications. In general also, the findings were not encouraging — especially for large scale (national) surveys.

Obviously, these findings (and we have no details at this writing) have important implications for this report, and they cast some doubt on our findings. Nevertheless, asking people is still the only method we have for collecting information on many subjects. In the case of maternal morbidity, alternatives to simply asking women are quite limited.

We can identify women who are pregnant and follow them through their pregnancy, delivery and puerperium (this was done in the Bangladesh study reported on here). This technique has its own methodological challenges and is not only expensive, but obligates the researcher to intervene when complications occur, thus altering their severity.

We can also evaluate clinic records (for events during pregnancy) and hospital records (for events during parturition and immediate postpartum). The limitations of institution-based data are well-known: not all complications are seen in institutions, many women deliver at home, and women have few prenatal visits. Events occur after women are discharged from hospital, and while they

are at home. For many reasons, some complications are more likely to be referred to hospital than others. Women who deliver in hospital are fundamentally different from women who deliver at home, and we cannot extrapolate to the population at large from Institution-based data. This is not to say, however, that institution-based data are not useful for other purposes.

Women who report continuing problems can be examined to confirm (and treat) those conditions. In women who do not report certain conditions, their absence can be confirmed on examination. But many obstetric complications are not continuing conditions — obstructed labor for example — so clinical examination cannot be used to confirm. Our collaborating investigators in Egypt conducted a clinical examination of all women reporting chronic conditions and a sample of those reporting no chronic conditions. This resulted in a change in reported prevalence of stress incontinence or VVF from 6.2% to 10.0%, of uterine prolapse from 11.3% to 31.0%, and of hemorrhoids from 12.5% to 10.7%. Although there was no change in prevalence of RVF, none of the women who reported it in fact had it, and 0.2% of those who did not report it, did have it. The prevalence of dyspareunia increased from 2.1% to 18.3%, but this resulted from additional (and perhaps more sensitive) questioning rather than a physical examination.

There are at least two lessons to be learned from the validation studies. First, we should not rely on a single method in our efforts to learn more about the prevalence of maternal morbidity. In countries with good record keeping and near universal institutional deliveries, we can use clinic records and hospital discharge surveys, but questionnaire-based surveys would still help us learn more about the prevalence of complications that are disruptive of women's lives but not life-threatening.

Second, in countries without good records, and where home deliveries predominate, we must continue to refine questionnaire-based methods as the alternatives are not attractive. Attention to qualitative research in the design phase of the survey almost certainly improves validity. Consideration should be given to alternative respondents (husbands, mothers-in-law, TBAs, neighbors) and perhaps even multiple respondents as in mortality surveys.

APPENDIX 1: DATA TABLES

- Table 1. Description of sample: household screen and individual record.
- Table 2. Percentage of women with selected demographic characteristics.
- Table 3. Percentage of women with selected socioeconomic characteristics.
- Table 4. Percentage of women selecting specified service outlets as usual place for treatment of "female diseases."
- Table 5. Percentage of women with live births and with other outcomes of pregnancy who had selected characteristics of the index country.
- Table 6. Percentage of women giving selected reasons for no antenatal care.
- Table 7. Percentage of women with selected characteristics of the index delivery.
- Table 8. Percentage of women delivering in specified places, by attendant at delivery.
- Table 9. Intended place of delivery, by actual place of delivery.
- Table 10. Percentage of women who perceive morbidities as serious, and percentage who sought care for morbidity among women who had specific antepartum morbidities in the index pregnancy.
- Table 11. Care seeking behavior for specific antepartum morbidities, by source of care.
- Table 12. Specific intrapartum morbidities in the index pregnancy, percent who perceived them as serious, percent who sought care.
- Table 13. Care seeking behavior for specific intrapartum morbidities, by source of care.
- Table 14. Specific postpartum morbidities in the index pregnancy, percent who perceived them as serious, percent who sought care.
- Table 15. Care seeking behavior for specific postpartum morbidities, by source of care.
- Table 16. Specific long-term morbidities, percent who sought care, and percent with lifestyle changes.
- Table 17. Care seeking behavior for specific long-term morbidities, by source of care.
- Table 18. Percentage of women with interventions at the time of the index pregnancy.
- Table 19. Percent of women with intrapartum morbidity and specific intervention.
- Table 20. Specific antepartum morbidities, by outcome of index pregnancy.
- Table 21. Specific intrapartum morbidities or interventions, by outcome of index pregnancy.
- Table 22. Specific postpartum morbidities in the index pregnancy, by outcome of index pregnancy.
- Table 23. Percent of women with morbidities in the index pregnancy, by severity of morbidity.
- Table 24. Number of long-term morbidities.
- Table 25. Ratio of morbidities to maternal mortality.
- Table 26. Ratio of women with morbidities to maternal mortality.

Conventions

na	means number not calculated at the time the report was finalized
nc	means data not collected, question not asked, response not available
--	means no cases in that category
0.0	means cases in the category, but percentage rounds to zero

Percentages are not calculated where there are fewer than 25 cases in a cell.

Table 1. Description of sample: household screen and interviewing record.				
Household screen				
	Bangladesh	Egypt	India	Indonesia
No. households visited	27 952	7 221	13 235	3 180
Mean household size	5.2	5.8	5.0	4.5
Mean no. of males	2.7	3.0	nc	2.3
Mean no. of females	2.6	2.8	1.4	2.3
Dates of household listing	Sept-Oct 1992	Mar 1992	Feb 1993	Dec 1992
Interview record				
No. of eligible women	7 031	4 548	3 502	na
Completed interviews	6 493	4 522	3 339	1 926
Refusals	538	17	163	na
Others	0	9	0	na
Dates of survey interviewing	Oct-Dec 1992	Mar 1992-Aug 1993	Feb-May 1993	Jan-Mar 1993

Table 2. Percentage of women with selected demographic characteristics.*				
Characteristics	Bangladesh	Egypt	India	Indonesia
<i>Age:</i>				
15-19	11.1	2.5	8.7	0.8
20-24	31.6	17.6	42.0	23.0
25-29	27.3	27.5	34.2	27.1
30-34	16.8	22.5	10.3	24.8
35-39	9.7	18.6	4.0	15.6
40-44	2.9	8.8	0.6	6.4
45-49	0.7	2.4	0.1	1.9
≥ 50	0.0	0.1	0.0	0.3
Total	100.0	100.0	100.0	100.0
Mean age (\pm SD)	26.2 \pm 6.1	30.1 \pm 6.6	24.7 \pm 4.6	29.6 \pm 6.3
<i>Number of pregnancies</i>				
1	22.4	12.3	25.5	20.7
2-3	36.2	36.8	51.9	48.1
4-5	21.4	27.2	18.1	20.0
≥ 6	20.0	23.7	4.5	11.2
Total	100.0	100.0	100.0	100.0
Mean (\pm SD)	3.5 \pm 2.4	4.0 \pm 2.4	2.6 \pm 1.5	2.2 \pm 0.9
<i>Number of live births</i>				
0	0.7	0.3	4.8	0.6
1	27.2	16.1	30.5	25.6
2-3	35.1	40.0	53.5	46.4
4-5	20.4	25.9	10.2	18.2
≥ 6	16.6	17.6	1.0	9.3
Total	100.0	100.0	100.0	100.0
Mean (\pm SD)	3.2 \pm 2.2	3.6 \pm 2.1	2.1 \pm 1.2	2.8 \pm 1.8
<i>Number of women</i>	(6 493)	(4 522)	(3 339)	(1 926)

Table notes: *Based on all women.

Table 3. Percentage of women with selected socioeconomic characteristics.				
Characteristics	Bangladesh	Egypt	India	Indonesia
<i>Education (years completed)*</i>				
None	62.7	50.5	51.1	2.2
1-3	4.5	3.8	20.3	34.5
4-6	21.1	13.9	14.1	52.8
7-11	11.2	4.5	12.7	5.7
12	0.4	19.5	1.5	4.3
>12	0.1	7.8	0.3	0.5
Total	100.0	100.0	100.0	100.0
<i>Literacy status*</i>				
Can read and write	37.3	43.4	45.6	90.9
Can neither read nor write	62.7	56.6	54.4	9.1
Total	100.0	100.0	100.0	100.0
<i>Socioeconomic status*</i>				
Low	69.7	48.2	48.4	51.5
Medium	29.0	32.9	32.8	33.4
High	1.4	18.9	18.8	15.1
Total	100.0	100.0	100.0	100.0
<i>Employment status*</i>				
Receives no payment	84.7	77.9	51.5	53.0
Receives payment	15.3	22.1	48.5	47.0
Total	100.0	100.0	100.0	100.0
<i>Number of women</i>				
	(6 493)	(4 522)	(3 339)	(1926)
<i>Place of employment**</i>				
Works at home	85.4	7.1	--	20.7
Works outside home	13.5	88.2	100.0	47.4
Works at home & outside	1.1	4.7	--	31.9
Total	100.0	100.0	100.0	100.0
Number of women	(992)	(1 001)	(1 618)	(1 496)
<i>Husband's education***</i>				
None	49.5	29.3	28.4	1.5
1-3	4.4	1.8	21.6	31.8
4-6	18.7	22.4	22.5	50.6
7-11	23.1	9.8	22.7	6.8
12	2.9	22.4	4.0	8.1
>12	1.3	14.1	0.8	1.2
Don't know	0.0	0.2	--	0.1
Total	100.0	100.0	100.0	100.0
Number of women	(6 386)	(4 421)	(3 339)	(1 926)

Table notes: *Based on all women.
** Based on women who do paid work.
*** Based on married women currently in union.

Table 4. Percentage of women selecting specified service outlets as usual place for treatment of "female diseases."				
Service Outlet	Bangladesh	Egypt	India	Indonesia
<i>Place of service*</i>				
No usual place	65.1	2.0	44.5	0.9
Government health center	--	20.3	16.4	77.1
Government hospital	3.7	17.4	10.9	1.1
Community health worker	--	--	--	2.0
Private clinic	--	48.4	13.3	10.6
Private hospital	4.9	5.3	13.6	0.4
Pharmacy ¹	8.0	0.3	0.3	--
TBA	--	0.3	--	1.7
Traditional practitioner	4.5	0.1	--	0.1
Other ²	14.3	6.0	1.0	6.1
Total	100.0	100.0	100.0	100.0
Number of women	(6 493)	(4 522)	(3 339)	(1 926)
<i>Time to health facility**</i>				
<½ hour	--	53.6	58.3	42.6
½-1 hour	66.5	42.1	5.7	48.6
>1 hour	33.5	3.5	36.0	8.8
Can't estimate	--	0.8	--	--
Total	100.0	100.0	100.0	100.0
Number of women	(1 761)	(4 170)	(1 852)	na
<i>Usual mode of transport**</i>				
Walking only	71.9	62.3	43.3	42.4
Nonmechanized means	16.1	1.4	8.0	4.3
Mechanized means	3.7	34.6	45.4	41.6
Walking and other means	8.3	1.7	3.3	11.6
Total	100.0	100.0	100.0	100.0
Number of women	(1 761)	(4 170)	(1 817)	(1 908)

Table notes:

*Based on all women.

**Based on women naming a usual source.

¹ Includes "husband brings home medicine."

² Includes village doctor, medical assistant, homeopath

Table 5. Percentage of women with live births and with other outcomes of pregnancy who had selected characteristics of the index pregnancy.

Characteristic	Bangladesh		Egypt	
	Live birth	Other	Live birth	Other
<i>Knowledge of nearest location of antenatal care*</i>				
Knows	71.6	76.2	87.9	89.2
Does not know	28.4	23.8	11.9	10.8
Total	100.0	100.0	100.0	100.0
Number of women	(6 237)	(256)	(4 259)	(263)
<i>Number of antenatal care visits*</i>				
0	13.9	37.5	31.5	40.8
1-3	79.0	60.9	46.2	39.6
4-6	7.1	1.6	14.4	11.2
≥7	--	--	7.7	8.0
Don't know/remember	--	--	0.1	0.4
Mean number of visits**	2.1±0.8	nc	3.5±5.0	3.7±8.6
Total	100.0	100.0	100.0	100.0
Number of women	(6 392)	(256)	(4 260)	(250)
<i>Month of first visit**</i>				
1-3	20.1	30.0	45.5	50.7
4-6	55.1	50.6	47.8	41.2
≥7	24.8	19.4	6.7	8.1
Total	100.0	100.0	100.0	100.0
Number of women	(5 369)	(160)	(2 912)	(148)
<i>Location of first antenatal visit**</i>				
Govt health center	26.9	26.3	46.8	39.2
Govt hospital	{	{	18.6	14.9
Private clinic	{	{	29.1	44.6
Private hospital	3.9	3.8	5.2	1.4
Home, with health worker	{	{	0.1	--
Other	{	{	0.2	--
Total	57.8	58.1	100.0	100.0
Number of women	11.4	11.8	(2 916)	(148)
	100.0	100.0		
	(5 369)	(160)		
<i>Reason for first visit**</i>				
Had specific problem	8.0	10.6	27.2	30.4
More routine reasons	1.5	1.3	32.1	41.9
Threatened miscarriage ¹	1.2	1.9	7.2	9.5
Tetanus injection	82.6	78.8	32.8	17.6
Iron tablets	2.2	1.9	0.1	--
Other	4.4	5.6	0.6	0.7
Total	100.0	100.0	100.0	100.0
Number of women	(5 369)	(160)	(2 915)	(148)

Table Notes: *Based on all women.

**Based on all women with care.

¹In Bangladesh and Egypt, this category includes confirmation of pregnancy.

Table 5 continued. Percentage of women with live births and with other outcomes of pregnancy who had selected characteristics of the index pregnancy.

Characteristic	India		Indonesia	
	Live birth	Other	Live birth	Other
<i>Knowledge of nearest location of antenatal care*</i>				
Knows	60.7	35.6	95.2	94.3
Does not know	39.3	64.4	4.8	5.7
Total	100.0	100.0	100.0	100.0
Number of women	(3 019)	(45)	(1 881)	(45)
<i>Number of antenatal care visits</i>				
0	2.4	(1)	--	--
1-3	35.7	46.7	22.7	23.3
4-6	37.1	33.3	45.1	41.2
≥7	24.8	17.8	32.2	35.4
Don't know/remember	--	--	--	--
Mean number of visits**	5.1±3.1	4.1±2.7	5.7	5.7
Total	100.0	100.0	100.0	100.0
Number of women	(3 019)	(45)	(1 799)	(35)
<i>Month of first visit**</i>				
1-3	43.4	25.0	nc	nc
4-6	47.0	63.6	nc	nc
≥7	9.6	11.4	nc	nc
Total	100.0	100.0		
Number of women	(2 947)	(44)		
<i>Location of first antenatal visit**</i>				
Govt health center	46.1	36.4	nc	nc
Govt hospital	11.5	11.3	nc	nc
Private clinic	12.8	15.9	nc	nc
Private hospital	13.2	27.3	nc	nc
Home, with health worker	16.2	9.1	nc	nc
Other	0.2	--	nc	nc
Total	100.0	100.0		
Number of women	(2 947)	(44)		
<i>Reason for first visit**</i>				
Had specific problem	8.4	18.2	nc	nc
More routine reasons	64.0	52.3	nc	nc
Threatened miscarriage	--	--	nc	nc
Tetanus injection	27.6	29.5	nc	nc
Iron tablets	--	--	nc	nc
Other	--	--	nc	nc
Total	100.0	100.0		
Number of women	(2 947)	(44)		

Table Notes: *Based on all women.

**Based on all women with care.

Table 6. Percentage of women giving selected reasons for no antenatal care.*				
Reason	Bangladesh	Egypt	India	Indonesia
<i>Felt fine</i>	65.7	88.0	60.3	nc
<i>Financial problems</i>	5.5	12.7	42.5	nc
<i>Accessibility problems</i>				
Didn't know about services	2.6	1.4	9.6	nc
Too far away	13.6	0.3	4.1	nc
No transport	0.3	0.0	5.5	nc
Inconvenient hours	0.8	0.6	2.7	nc
Others	0.6	nc	nc	
<i>Acceptability problems</i>				
Poor quality care/bad reputation	8.2	1.1	4.1	nc
Prefer traditional treatment	0.8	0.7	0.0	nc
Others	0.5	0.0	0.0	nc
<i>Family Issues</i>				
Husband/family didn't allow	8.7	0.6	9.6	nc
No one to watch children	2.0	1.7	17.8	nc
Too busy/too much work	6.7	7.1	39.7	nc
Others	8.7	3.1	24.6	nc
<i>Number of women giving</i>				
One reason	2408	1209	10	nc
Two reasons	590	210	23	nc
Three reasons	86	26	36	nc
<i>Number of women</i>	964	1445	69	nc

Table notes: *Based on women with no antenatal care.

Percentages may add to more than 100% as more than one response may be given.

Table 7. Percentage of women with selected characteristics of the index delivery.				
Characteristics	Bangladesh	Egypt	India	Indonesia
<i>Outcome of index delivery*</i>				
Live birth	96.1	94.2	90.4	97.7
Stillbirth	2.4	1.1	1.4	1.8
Miscarriage/abortion	1.6	4.5	8.2	0.5
Other (ectopic, mole etc)	--	0.1	--	--
Total	100.0	100.0	100.0	100.0
Number of women (all)	(6 493)	(4 522)	(3 339)	(1 926)
<i>Place of delivery**</i>				
Government hospital	0.7	10.5	40.0	2.3
Government health center	0.3	0.5	2.4	1.6
Private hospital	0.3	1.7	15.0	--
Private clinic	0.3	9.3	0.4	4.1
Own home	75.4	77.3	41.5	80.4
Someone else's home	23.0	0.5	0.1	11.2
Other	--	0.1	0.6	0.4
Total	100.0	100.0	100.0	100.0
<i>Attendant at delivery**</i>				
Physician	2.4	30.3	22.2	1.3
Midwife	6.7	17.4	39.0	6.4
TBA	49.0	37.7	35.6	90.7
Female relative	39.2	3.3	1.3	0.9
Other	2.7	11.3	1.8	0.7
None	--	0.1	0.1	--
Total	100.0	100.0	100.0	100.0
<i>Length of labor**</i>				
>18 hours	6.5	2.7	1.4	5.1
≤18 hours	93.5	95.0	98.4	94.8
Don't know	--	2.3	0.2	0.1
Total	100.0	100.0	100.0	100.0
<i>Number of women (with live or stillbirths)</i>	(6 392)	(4 310)	(3 064)	(1 916)

Table notes: *Based on all women.

** Based on women with live or stillbirths.

Table 8. Percentage of women delivering in specified places, by attendant at delivery.*

Place of delivery	Bangladesh: N = 6392					Egypt: N = 4310				
	Doctor	Midwife	TBA	Female rel	Other	Doctor	Midwife	TBA	Female rel	Other
<i>Government hospital</i>	86.4	13.6	--	--	--	96.7	0.4	0.2	1.7	0.9
<i>Government health center</i>	61.1	38.9	--	--	--	36.4	45.5	13.6	--	4.5
<i>Private hospital</i>	70.6	29.4	--	--	--	98.6	--	--	--	1.4
<i>Private doctor/clinic</i>	100.0	--	--	--	--	95.8	0.3	0.3	2.1	1.8
<i>Own home</i>	0.8	6.9	50.8	38.4	3.1	12.0	21.9	48.0	3.8	14.4
<i>Someone else's home</i>	--	--	--	--	--	--	18.2	72.7	9.1	--
<i>Other</i>	2.3	5.3	46.2	44.6	1.6	20.0	20.0	40.0	--	20.0
	India: N = 3064					Indonesia N = 1916				
<i>Government hospital</i>	34.0	65.2	0.1	0.1	0.6	46.5	44.2	9.3	--	--
<i>Government health center</i>	31.1	64.8	2.7	--	1.4	3.3	70.0	13.3	--	13.3
<i>Private hospital</i>	50.4	49.3	0.3	--	--	--	--	--	--	--
<i>Private clinic</i>	53.8	46.2	--	--	--	2.6	86.8	10.5	--	--
<i>Own home</i>	--	8.4	85.1	2.8	3.7	0.1	0.6	97.9	1.0	0.5
<i>Someone else's home</i>	--	--	100.0	--	--	--	--	100.0	--	--
<i>Other</i>	10.5	26.3	31.6	15.8	15.8	--	1.4	96.7	0.9	0.9

Table notes: *Based on women with live or stillbirths

Table 9. Intended place of delivery, by actual place of delivery.*

Intended place of delivery	Bangladesh N = 6392								Egypt N = 4310							
	Place of delivery								Place of delivery							
	Govt hospital	Govt health center	Private hospital	Private clinic	Own home	Other home	Other	Total	Govt hospital	Govt health center	Private hospital	Private clinic	Own home	Other home	Other	Total
<i>Govt hospital</i>	89.3	--	--	--	7.1	--	3.6	100.0	92.8	--	0.4	0.4	5.9	0.4	--	100.0
<i>Govt health ctr</i>	--	77.8	--	11.1	11.1	--	--	100.0	7.1	85.7	--	--	7.1	--	--	100.0
<i>Private hospital</i>	6.3	--	56.3	6.3	12.5	--	18.8	100.0	2.0	0.3	93.8	0.7	3.3	--	--	100.0
<i>Private clinic</i>	--	--	--	88.2	5.9	--	5.9	100.0	2.0	0.3	0.7	93.8	3.3	--	--	100.0
<i>Own home</i>	0.2	0.1	0.1	--	98.5	--	0.9	100.0	6.2	0.2	0.2	3.1	90.0	0.2	0.1	100.0
<i>Other home</i>	--	--	--	--	--	--	--	--	10.5	--	--	--	21.1	68.4	--	100.0
<i>Other</i>	0.4	0.3	0.2	0.1	10.1	--	88.9	100.0	--	--	--	--	--	--	100.0	100.0
	India N = 3064								Indonesia N = 1916							
<i>Govt hospital</i>	76.0	0.6	4.2	0.2	18.2	0.1	0.7	100.0	nc	nc	nc	nc	nc	nc	nc	nc
<i>Govt health ctr</i>	29.3	48.9	1.1	1.1	18.5	--	1.1	100.0	nc	nc	nc	nc	nc	nc	nc	nc
<i>Private hospital</i>	13.0	0.6	74.2	--	12.2	--	--	100.0	nc	nc	nc	nc	nc	nc	nc	nc
<i>Private clinic</i>	20.6	2.9	11.8	26.5	38.2	--	--	100.0	nc	nc	nc	nc	nc	nc	nc	nc
<i>Own home</i>	10.8	1.5	3.9	--	83.2	0.2	0.6	100.0	nc	nc	nc	nc	nc	nc	nc	nc
<i>Other home</i>	57.1	--	--	--	28.6	14.3	--	100.0	nc	nc	nc	nc	nc	nc	nc	nc
<i>Other</i>	35.8	--	18.9	--	41.5	--	3.8	100.0	nc	nc	nc	nc	nc	nc	nc	nc

Table notes: *Based on women with live or stillbirths.

Table 10. Percentage of women who perceived morbidities as serious, and percentage who sought care for the morbidity among women who had specific antepartum morbidities in the index pregnancy.*

Morbidity	Bangladesh N = 6392				Egypt N = 4310			
	Women with morbidity		% perceived serious	% sought care***	Women with morbidity		% perceived serious	% sought care*** (3)
	N	% (1)			N	% (1)		
<i>Edema (hands and face)</i>	1463	22.9	41.9	77.7	551	12.8	61.0	78.9
<i>Bleeding</i>	165	2.6	58.8	80.4	178	4.1	93.8	94.6
<i>Fits/convulsions</i>	190	3.0	85.8	85.8	12	(12)	(10)	(10)
<i>Fever >3 days</i>	1075	16.8	61.5	86.7	253	5.9	88.1	89.2
<i>Severe vomiting</i>	1238	19.4	51.9	75.7	1006	23.3	51.6	78.6
<i>Hypertension**</i>	230	3.6	77.0	96.0	671	15.6	90.9	96.2
<i>Urinary problems</i>	1880	29.4	54.8	77.0	532	12.3	79.7	85.1
Non-obstetric morbidity during pregnancy								
<i>Pulmonary TB</i>	22	(22)	(16)	(13)	10	(10)	nc	nc
<i>Malaria</i>	200	3.1	69.0	81.9	9	(9)	nc	nc
<i>Gaundice</i>	377	5.9	65.0	95.5	3	(3)	nc	nc
<i>Rheumatic heart disease</i>	324	5.1	49.1	75.5	30	0.7	nc	nc

<i>varicose veins</i>	470	7.3	39.4	67.0	315	7.3	nc	nc
-----------------------	-----	-----	------	------	-----	-----	----	----

Table 10 continued. Percentage of women who perceived morbidities as serious, and percentage who sought care for the morbidity among women who had specific antepartum morbidities in the index pregnancy.*

Morbidity	India N = 3064				Indonesia N = 1916			
	Women with morbidity		% perceived as serious (2)	% sought care*** (3)	Women with morbidity		% perceived serious (2)	% sought care*** (3)
	N	% (1)			N	% (1)		
<i>oedema (hands and face)</i>	387	12.6	49.9	89.6	198	10.3	nc	nc
<i>bleeding</i>	13	(13)	(11)	(11)	61	3.2	nc	nc
<i>fits/convulsions</i>	10	(10)	(9)	(8)	142	7.4	nc	nc
<i>fever >3 days</i>	122	4.0	59.0	95.8	18	(18)	nc	nc
<i>severe vomiting</i>	589	19.2	48.2	85.6	nc	nc	nc	nc
<i>hypertension**</i>	27	0.9	(14)	(11)	nc	nc	nc	nc
<i>urinary problems</i>	365	12.4	30.7	65.2	nc	nc	nc	nc

Non-obstetric morbidity during pregnancy

<i>pulmonary TB</i>	6	(6)	(4)	(4)	nc	nc	nc	nc
<i>malaria</i>	12	(12)	(11)	(11)	nc	nc	nc	nc

<i>haemorrhoids</i>	3	(2)	(2)	(2)	nc	nc	nc	nc
<i>rheumatic heart disease</i>	12	(12)	(10)	(9)	nc	nc	nc	nc
<i>varicose veins</i>	43	1.4	58.1	64.0	nc	nc	nc	nc

Table notes: *Based on women with live and stillbirths. **Based on women whose blood pressure was measured. ***Based on women with the condition *and* who perceived it to be serious.

Col. 1: % women with morbidity = number of women with morbidity / number of women with live or stillbirths x 100.

Col. 2: % perceived as serious = number of women who perceived as serious / number of women with morbidity x 100.

Col. 3: % sought care = number of women who sought care / number who perceived as serious x 100.

Table 11. Care seeking behavior for specific antepartum morbidities, by source of care.*

Morbidity	Bangladesh N = 6392							
	Govt health center	Govt hospital	Private doctor/ clinic	Private hospital	Pharmacy	Other **	No care	Total
	%	%	%	%	%	%	%	N
<i>Edema (hands/face)</i>	9.0	--	--	--	1.2	28.4	61.4	1463
<i>Bleeding</i>	13.9	--	--	--	--	38.2	48.0	165
<i>Fits/convulsions</i>	21.9	--	--	--	0.0	52.6	25.5	190
<i>Fever >3 days</i>	15.1	--	--	--	1.5	48.5	35.0	1075
<i>Severe vomiting</i>	9.6	--	--	--	2.0	32.4	56.0	1238
<i>Hypertension***</i>	39.1	--	--	--	0.9	40.5	19.6	230
<i>Urinary problems</i>	10.3	--	--	--	0.8	37.4	51.5	1880
<i>Pulmonary TB</i>	(4)	--	--	--	--	(10)	(8)	22
<i>Malaria</i>	22.0	--	--	--	2.4	44.8	30.2	200
<i>Jaundice</i>	8.3	--	--	--	1.0	62.8	28.0	377
<i>Rheum. heart dis</i>	10.4	--	--	--	2.1	33.7	53.7	324
<i>Varicose veins</i>	9.1	--	--	--	1.9	21.4	67.7	470
	India N = 3064							
<i>Edema (hands/face)</i>	13.4	19.1	15.8	22.2	(5)	8.8	19.4	387
<i>Bleeding</i>	(2)	(2)	(4)	(5)	--	--	--	13
<i>Fits/convulsions</i>	(3)	(2)	(1)	(1)	--	(1)	(2)	10
<i>Fever >3 days</i>	19.0	9.9	33.0	23.2	9.9	(1)	(5)	121
<i>Severe vomiting</i>	11.7	8.7	26.1	23.1	(5)	5.9	23.6	589
<i>Hypertension***</i>	(3)	(5)	(1)	(2)	--	--	(16)	27
<i>Urinary problems</i>	14.4	10.5	13.4	18.9	(3)	10.0	32.0	381
<i>Pulmonary TB</i>	(2)	--	(2)	(1)	--	--	(1)	6
<i>Malaria</i>	(1)	(1)	(5)	(5)	--	--	--	12
<i>Jaundice</i>	(1)	--	--	(1)	--	(1)	--	2
<i>Rheum. heart dis</i>	(1)	(4)	(1)	(2)	--	(2)	(2)	12
<i>Varicose veins</i>	14.0	(3)	18.6	14.0	--	(2)	41.7	43

Table 11 continued. Care seeking behavior for specific antepartum morbidities, by source of care.*

Morbidity	Egypt N = 4310							
	Govt health center %	Govt hospital %	Private doctor/ clinic %	Private hospital %	Pharmacy %	Other ** %	No care %	Total N
<i>Edema (hands/face)</i>	7.1	5.3	38.8	1.3	0.9	0.5	46.1	551
<i>Bleeding</i>	5.1	25.3	56.2	1.7	0.6	0.6	10.7	178
<i>Fits/convulsions</i>	--	(2)	(8)	--	--	--	(2)	12
<i>Fever >3 days</i>	14.2	12.6	41.9	3.2	11.1	--	17.0	253
<i>Severe vomiting</i>	7.1	5.6	34.5	1.5	3.0	0.2	48.0	1006
<i>Hypertension***</i>	15.2	11.5	61.7	4.5	0.4	0.7	6.0	671
<i>Urinary problems</i>	16.2	11.3	39.5	4.1	4.3	--	24.6	532
<i>Pulmonary TB</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Malaria</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Jaundice</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Rheum. heart dis</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Varicose veins</i>	8.9	5.1	32.1	1.9	0.6	--	51.4	315
	Indonesia N = 1916							
<i>Edema (hands/face)</i>	78.3	(4)	13.1	(10)	--	4.6	1.5	198
<i>Bleeding</i>	75.4	(3)	(7)	(10)	--	6.6	0.0	61
<i>Fits/convulsions</i>	88.9	(8)	(8)	--	--	0.0	0.0	18
<i>Fever >3 days</i>	(15)	(1)	(2)	--	--	7.7	0.7	42
<i>Severe vomiting</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Hypertension***</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Urinary problems</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Pulmonary TB</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Malaria</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Jaundice</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Rheum. heart dis</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Varicose veins</i>	nc	nc	nc	nc	nc	nc	nc	nc

Table notes: *Based on women with live or stillbirths.
 **Includes traditional practitioners, TBAs, village doctors, homeopaths and medical assistants.
 ***Based on women whose blood pressure was measured.

Table 12. Specific intrapartum morbidities in the index pregnancy,* percent who perceived them as serious, and percent who sought care.

Morbidity	Bangladesh N = 6392				Egypt N = 4310			
	Women with morbidity		% perceived as serious (2)	% sought care (3)	Women with morbidity		% perceived serious (2)	% sought care (3)
	N	% (1)			N	% (1)		
<i>Labor >18 hours</i>	419	6.6	85.2	90.8	156	3.6	84.6	81.1
<i>Fits/convulsions</i>	224	3.5	81.7	83.6	6	(6)	(6)	(6)
<i>Loss of consciousness</i>	0	--	--	--	103	2.4	85.4	77.3
<i>Excessive bleeding</i>	1255	56.7	56.7	70.5	178	4.1	98.3	94.3
<i>Ruptured uterus</i>	0	--	--	--	13	(13)	(11)	(10)
<i>Any tear</i>	98	1.5	58.2	78.9	427	9.9	61.4	70.6

Table 12 continued. Specific intrapartum morbidities in the index pregnancy,* percent who perceived them as serious, and percent who sought care.

Morbidity	India N = 3064				Indonesia N = 1916			
	Women with morbidity		% perceived as serious (2)	% sought care (3)	Women with morbidity		% perceived as serious (2)	% sought care (3)
	N	% (1)			N	% (1)		
<i>Labor >18 hours</i>	41	1.3	92.7	47.4	96	5.0	nc	nc
<i>Fits/convulsions</i>	6	(6)	(6)	(6)	37	1.9	nc	nc
<i>Loss of consciousness</i>	29	0.9	68.9	90.0	62	3.2	nc	nc
<i>Excessive bleeding</i>	27	0.9	62.9	100.0	292	10.5	nc	nc
<i>Ruptured uterus</i>	0	--	--	--	nc	nc	nc	nc
<i>Any tear</i>	195	6.4	nc	nc	nc	nc	nc	nc

Table notes: *Based on women with live or stillbirths. Each column is a subset of the previous column; i.e. of women with morbidity, what percent perceived it as serious? Of women who perceived it as serious, what percent sought care?

Col. 1: % women with morbidity = number of women with morbidity/ number of women with live or stillbirths x 100.

Col. 2: % perceived as serious = number of women who perceived as serious/ number of women with morbidity x 100.

Col. 3: % sought care = number of women who sought care/ number who perceived as serious x 100.

**Table 13. Care seeking behavior for specific intrapartum morbidities,*
by source of care.**

Morbidity	Bangladesh N = 6392							
	Govt health center %	Govt hospital %	Private doctor/ clinic %	Private hospital %	Pharmacy %	Other %	No care %	Total N
<i>Labor > 18 hours</i>	28.4	--	--	--	0.5	52.9	18.1	419
<i>Fits/convulsions</i>	28.5	--	--	--	0.9	41.1	29.5	224
<i>Loss of consciousness</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Excessive bleeding</i>	11.2	--	--	--	1.6	29.7	57.5	1255
<i>Ruptured uterus</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Torn vagina/cervix</i>	20.4	0.0	0.0	0.0	3.1	29.6	46.9	98
	India N = 3064							
<i>Labor > 18 hours</i>	4.9	58.5	0.0	24.4	0.0	9.8	2.4	41
<i>Fits/convulsions</i>	--	(2)	--	--	--	(4)	--	6
	0.0	50.0	0.0	0.0	0.0	0.0	50.0	2
<i>Loss of consciousness</i>	--	27.6	3.4	10.4	0.0	55.2	3.4	29
<i>Excessive bleeding</i>	--	40.7	3.8	22.2	0.0	29.6	3.7	27
<i>Ruptured uterus</i>	--	--	--	--	--	--	--	0
<i>Torn vagina/cervix</i>	2.6	50.3	0.0	26.6	0.0	20.5	--	195

**Table 13 continued. Care seeking behavior for specific intrapartum morbidities,*
by source of care.**

Morbidity	Egypt N = 4310							
	Govt health Center %	Govt hospital %	Private doctor/ clinic %	Private hospital %	Pharmacy %	Other %	No care %	Women N
<i>Labor > 18 hours</i>	3.2	23.1	37.2	3.8	--	2.6	29.5	156
<i>Fits/convulsions</i>	--	(2)	(3)	--	--	(1)	--	6
<i>Loss of consciousness</i>	2.9	22.3	33.0	1.9	2.9	7.8	29.1	103
<i>Excessive bleeding</i>	3.9	29.2	46.1	1.7	3.9	8.4	6.7	178
<i>Ruptured uterus</i>	--	69.2	--	--	--	--	30.8	13
<i>Torn vagina/cervix</i>	2.6	9.4	22.7	0.7	11.7	4.7	48.2	427
	Indonesia N = 1916							
<i>Labor >18 hours</i>	71.9	2.1	14.6	--	--	10.4	1.0	96
<i>Fits/convulsions</i>	75.7	5.4	16.2	--	--	2.7	--	37
<i>Loss of consciousness</i>	75.8	0.0	8.1	1.6	--	14.5	--	62
<i>Excessive bleeding</i>	78.4	0.3	9.3	0.7	--	11.0	0.3	292
<i>Ruptured uterus</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Torn vagina/cervix</i>	nc	nc	nc	nc	nc	nc	nc	nc

Table notes: * Based on women with live and still births

Table 14. Specific postpartum morbidities in the index pregnancy,* percent who perceived them as serious, percent who sought care.

Morbidity	Bangladesh N = 6392				Egypt N = 4310			
	Women with morbidity		% perceived as serious (2)	% sought care*** (3)	Women with morbidity		% perceived as serious (2)	% sought care*** (3)
	N	% (1)			N	% (1)		
<i>Pelvic pain</i>	3135	19.0	65.6	87.4	944	21.9	55.2	75.6
<i>Painful urination</i>	1238	19.4	46.3	71.2	327	7.6	80.7	75.8
<i>Excessive bleeding</i>	1096	17.1	61.6	74.8	153	3.5	97.4	94.0
<i>High fever</i>	1054	16.5	67.5	86.5	668	15.5	90.0	94.7
<i>Foul smell/discharge</i>	65	10.2	44.6	51.0	424	9.8	56.8	66.8
<i>Breast condition**</i>	425	6.6	60.0	76.4	625	14.5	67.4	82.2
<i>Shock/loss of consciousness</i>	288	4.5	66.0	92.6	89	2.1	87.6	80.8
<i>Depression ≥2 weeks</i>	416	2.6	16.4	14.7	121	12.8	43.0	44.2
<i>Depression <2 weeks</i>	167	6.5	41.9	44.3	36	0.8	66.7	45.8
<i>Fits/Convulsions</i>	92	1.4	78.3	84.7	6	--	(6)	(6)

Table 14 continued. Specific postpartum morbidities in the index pregnancy,* percent who perceived them as serious, percent who sought care.

Morbidity	India N = 3064				Indonesia N = 1916			
	Women with morbidity		% perceived as serious (2)	% sought care*** (3)	Women with morbidity		% perceived as serious (2)	% sought care*** (3)
	N	% (1)			N	% (1)		
<i>Pelvic pain</i>	136	4.4	67.6	80.4	290	15.2	37.6	89.9
<i>Painful urination</i>	111	3.6	62.2	72.5	110	5.8	50.0	85.5
<i>Excessive bleeding</i>	55	1.8	60.0	66.7	215	11.2	28.4	100.0
<i>High fever</i>	163	5.3	68.1	94.6	257	13.4	23.3	100.0
<i>Foul smell/discharge</i>	14	0.5	(8)	(5)	86	4.5	24.4	100.0
<i>Breast condition**</i>	87	2.9	70.1	83.6	40	2.1	75.0	100.0
<i>Shock/loss of consciousness</i>	26	0.9	57.7	73.3	62	3.2	35.5	100.0
<i>Depression ≥2 weeks</i>	3	0.1	(3)	(2)	0	--	--	--
<i>Depression <2 weeks</i>	4	0.1	(3)	(2)	91	4.8	39.6	38.9
<i>Fits/Convulsions</i>	11	(11)	(9)	(8)	20	(20)	(8)	(7)

Table notes: * Based on women with live or stillbirths.

** Breast abscess in Bangladesh and Indonesia, mastitis and cracked nipples in Egypt and India.

*** Note that, in addition, women sought care who did not perceive the morbidity as serious.

Col. 1: % women with morbidity = number of women with morbidity / number of women with live or stillbirths x 100.

Col. 2: % perceived as serious = number of women who perceived as serious / number of women with morbidity x 100.

Col. 3: % sought care = number of women who sought care / number who perceived as serious x 100.

Table 15. Care seeking behavior for specific postpartum morbidities, by source of care.*

Morbidity	Bangladesh N = 6392							
	Govt health center %	Govt hospital %	Private doctor/ clinic %	Private hospital %	Pharmacy %	Other %	No care %	Total N
<i>Excessive bleeding</i>	11.2	--	--	--	1.6	37.4	49.7	1096
<i>High fever</i>	13.3	--	--	--	4.9	51.5	30.3	1054
<i>Loss of consciousness</i>	19.8	--	--	--	1.7	45.5	33.0	288
<i>Fits/convulsions</i>	22.8	--	--	--	2.2	53.3	21.7	92
<i>Foul discharge</i>	4.9	--	--	--	1.4	19.9	73.9	654
<i>Pelvic pain</i>	13.0	--	--	--	6.5	47.8	32.9	3135
<i>Breast condition**</i>	9.2	--	--	--	2.1	40.2	48.5	425
<i>Painful urination</i>	10.4	--	--	--	1.4	27.1	61.1	1238
<i>Depression >2 weeks</i>	1.0	--	--	--	--	1.4	97.6	416
<i>Depression ≤2weeks</i>	9.0	--	--	--	0.6	9.6	80.8	167
	India N = 3064							
<i>Excessive bleeding</i>	21.8	16.4	10.9	9.1	0.0	5.5	36.4	55
<i>High fever</i>	14.1	20.9	26.9	16.6	9.2	4.9	7.4	163
<i>Loss of consciousness</i>	3.8	26.9	7.7	26.9	0.0	0.0	34.6	26
<i>Fits/convulsions</i>	(1)	(3)	(3)	(2)	--	--	(2)	11
<i>Foul discharge</i>	(2)	(3)	(1)	(1)	--	(1)	(6)	14
<i>Pelvic pain</i>	12.4	20.6	15.4	10.3	5.1	11.0	23.5	136
<i>Breast condition**</i>	5.7	13.8	13.8	17.2	8.0	21.8	19.5	87
<i>Painful urination</i>	9.6	10.8	9.6	12.0	2.4	14.5	41.0	111
<i>Depression >2 weeks</i>	--	(2)	--	--	--	--	(1)	3
<i>Depression ≥2 weeks</i>	--	(2)	--	--	--	(1)	(1)	4

Table notes:

*Based on women with live or still births.

**Breast abscess in Bangladesh and Indonesia, mastitis and cracked nipples in Egypt and India.

Table 15 continued. Care seeking behavior for specific postpartum morbidities, by source of care.*

Morbidity	Egypt N = 4310							
	Govt health center %	Govt hospital %	Private doctor/ clinic %	Private hospital %	Pharmacy %	Other %	No care %	Total N
<i>Excessive bleeding</i>	3.9	28.1	46.4	3.3	7.8	2.6	7.8	153
<i>High fever</i>	10.6	13.2	48.2	1.5	15.4	1.8	9.1	668
<i>Loss of consciousness</i>	6.7	20.2	44.9	1.1	1.1	0.0	25.8	89
<i>Fits/convulsions</i>	--	(1)	(5)	--	--	--	--	6
<i>Foul discharge</i>	6.1	4.0	23.6	0.7	11.1	1.9	52.6	424
<i>Pelvic pain</i>	4.4	6.9	26.3	1.4	16.7	3.5	40.8	944
<i>Breast condition**</i>	4.8	5.3	34.1	1.0	21.0	0.6	33.3	625
<i>Painful urination</i>	10.4	11.6	38.8	2.1	5.2	0.0	31.8	327
<i>Depression >2 weeks</i>	0.0	4.1	12.4	0.8	1.7	0.8	80.2	121
<i>Depression ≤2weeks</i>	0.0	5.6	27.8	0.0	0.0	0.0	66.7	36
	Indonesia N = 1916							
<i>Excessive bleeding</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>High fever</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Loss of consciousness</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Fits/convulsions</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Foul discharge</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Pelvic pain</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Breast condition**</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Pain urination</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Depression >2 weeks</i>	nc	nc	nc	nc	nc	nc	nc	nc
<i>Depression ≥2 weeks</i>	nc	nc	nc	nc	nc	nc	nc	nc

This page left blank intentionally.

Table 16. Specific long-term morbidities,* percent who sought care, and percent with lifestyle changes.

Morbidity	Bangladesh N = 6493				Egypt N = 4522					
	Women with morbidity		Sought care	Affected daily activities	Affected relationship with husband	Women with morbidity		Sought care	Affected daily activities	Affected relationship with husband
	N	(1) %	(2) %	(3) %	(4) %	N	(1) %	(2) %	(3) %	(4) %
<i>Incontinence/VVF**</i>	502	7.7	22.3	19.3	8.2	282	6.2	17.0	11.7	6.0
<i>Rectovaginal fistula</i>										
Passage of stools	5	0.1	(2)	(2)	(1)	7	0.2	(0)	(0)	(0)
Passage of gas	331	5.1	16.3	15.4	6.7	49	1.1	4.1	10.2	4.1
<i>Uterine prolapse</i>	983	15.1	35.2	--	9.5	509	1.3	27.3	nc	29.5
<i>Dyspareunia</i>	516	7.9	22.7	--	34.3	94	.1	91.5	nc	67.0
<i>Hemorrhoids</i>	280	4.3	52.5	--	--	567	2.5	44.1	nc	nc
	India N = 3339				Indonesia N = 1926					
<i>Incontinence/VVF**</i>	104	3.1	20.2	na	na	44	2.3 ¹	22.7	15.9	13.6
<i>Rectovaginal fistula</i>										
Passage of stools	0	--	--	--	--	3	0.2	(0)	(2)	(0)
Passage of gas	2	0.06	(1)	(2)	100.0	16	0.8	(2)	(2)	(2)
<i>Uterine Prolapse</i>	111	3.3	24.3	nc	0.0	316	16.4	85.4 ²	nc	25.5
<i>Dyspareunia</i>	55	1.7	16.4	nc	0.0	8	0.4	(1)	nc	(4)
<i>Hemorrhoids</i>	45	1.4	46.7	nc	na	44	2.3	61.4	nc	nc

Table notes: *Based on all women. **VVF = vesicovaginal fistula. ¹ Probably under-reported because of translation problem. ² Mostly massage by TBA.

Col. 1: % women with morbidity = number of women with morbidity / all women.

Col. 2: % sought care = number of women who sought care / number of women with morbidity.

Col. 3: % women with changed daily life = number of women with changed daily life / number of women with morbidity.

Col. 4: % women with changed marital relationship = number of women with changed marital relationship / number of women with morbidity.

Table 17. Care seeking behavior for specific long-term morbidities,* by source of care.

Morbidity	Bangladesh N = 6493								
	Govt health center	Govt hospital	Govt Com health worker	Private doctor/ clinic	Private hospital	Pharmacy	Other**	No care	Total
	%	%	%	%	%	%	%	%	N
<i>Incontinence/ VVF</i>	7.8	0.0	0.0	0.0	0.6	0.0	14.8	77.7	502
<i>Rectovaginal fistula</i>									
Passage of stools	(2)	--	--	--	--	--	--	(3)	5
Passage of gas	5.2					0.3	10.9	83.6	330
<i>Uterine prolapse</i> lapse	12.3	--	--	--	--	0.0	22.8	64.9	983
<i>Dyspareunia</i>	6.0	--	--	--	--	0.2	12.5	81.0	516
<i>Hemorrhoids</i>	7.0	0	0	0	0	0	45.4	47.5	280
	India N = 3339								
<i>Incontinence/VVF</i>	3.9	1.0	--	6.7	1.0	1.9	1.9	83.6	104
<i>Rectovaginal fistula</i>									
Passage of stools									
Passage of gas	--	(1)	--	--	--	--	--	(1)	2
<i>Uterine prolapse</i>	0.9	6.3	--	5.4	3.6	--	3.6	80.2	111
<i>Dyspareunia</i>	--	--	--	3.6	7.3	--	3.6	85.5	55
<i>Hemorrhoids</i>	6.7	6.7	--	15.6	6.7	--	11.1	53.3	45

Table notes: *Based on all women.

**Includes traditional practitioners, TBAs, village doctors, homeopaths and medical assistants.

Table 17 continued. Care seeking behavior for specific long-term morbidities,* by source of care.

Morbidity	Egypt N = 4522								
	Govt health center	Govt hospital	Govt com health worker	Private doctor/ clinic	Private hospital	Pharmacy	Other **	No care	Total
	%	%	%	%	%	%	%	%	N
<i>Incontinence/VVF</i>	4.3	3.5	0.0	9.2	0.7	0.4	0.4	81.6	282
<i>Rectovaginal fistula</i>									
Passage of stools	--	--	--	--	--	--	--	--	7
Passage of gas	--	--	--	4.1	--	--	--	95.9	49
<i>Uterine prolapse</i>	4.3	3.1	--	19.1	0.2	--	0.6	72.7	509
<i>Dyspareunia</i>	4.3	1.1	--	14.9	--	--	1.1	78.7	94
<i>Hemorrhoids</i>	4.8	5.8	--	25.7	2.6	4.9	0.2	55.9	567
Morbidity	Indonesia N = 1926								
<i>Incontinence/VVF</i>	75.0	0	0	9.1	0	0	15.9	0	44
<i>Rectovaginal fistula</i>									
Passage of stools	(1)	--	--	--	--	--	(2)	--	3
Passage of gas	(6)	(2)	--	(4)	--	--	(4)	--	16
<i>Uterine prolapse</i>	79.1	1.3	--	9.2	0.3	--	9.5	0.6	316
<i>Dyspareunia</i>	(7)	(1)	--	--	--	--	--	--	8
<i>Hemorrhoids</i>	77.3	--	--	4.5	2.3	--	15.9	--	44

This page left blank intentionally.

Table 18. Percentage of women with interventions at the time of the index pregnancy.*				
Intervention	Bangladesh N = 6392	Egypt N = 4310	India N = 3064	Indonesia N = 1916
<i>Given drugs to accelerate delivery</i>				
Yes	24.2	41.0	45.3	nc
No	75.8	58.6	54.7	nc
Don't know/remember	--	0.4	--	nc
Total	100.0	100.0	100.0	nc
<i>Cesarean section</i>				
Yes	0.2	4.2	5.5	0.7
No	99.8	95.8	94.5	99.3
Total	100.0	100.0	100.0	100.0
<i>Instrumental delivery**</i>				
Yes	0.2	4.2	4.5	1.6
No	99.8	95.8	95.5	98.4
Total	100.0	100.0	100.0	100.0
<i>Episiotomy</i>				
Yes	0.5	9.6	19.3	nc
No	99.5	90.2	80.7	nc
Don't know/remember	--	0.2	--	nc
Total	100.0	100.0	100.0	nc
<i>Hysterectomy</i>				
Yes	--	0.2	--	0.8
No	100.0	99.8	100.0	97.0
Don't know/remember	--	--	--	2.3
Total	100.0	100.0	100.0	100.0
<i>Number of interventions per woman</i>				
0	73.4	53.8	49.5	97.0
1	22.5	35.5	30.2	2.9
2	3.8	8.8	16.9	0.1
3	0.3	1.9	3.4	--
4	--	--	--	--
5	--	--	--	--
Total	100.0	100.0	100.0	100.0

Table notes: *Based on women with live or stillbirths.

** Not including cesarean section.

Table 19. Percent of women with intrapartum morbidity and specific intervention*

Morbidity	Bangladesh N = 6392						
	Women with condition	Drugs %	Cesarean section %	Instrumental delivery %	Episiotomy %	Hysterectomy %	None %
<i>Labor > 18 hours</i>	419	71.6	0.7	1.0	1.2	nc	na
<i>Fits/convulsions or loss of consciousness</i>	nc	nc	nc	nc	nc	nc	nc
<i>Excessive bleeding</i>	1255	34.7	0.2	0.3	0.5	nc	na
<i>Ruptured uterus</i>	0	--	--	--	--	--	--
<i>Any tear</i>	98	54.1	--	2.0	6.1	nc	na
<i>No morbidity</i>	na	96.9	0.0	0.6	2.5	nc	na
	India N = 3064						
<i>Labor >18 hours</i>	41	82.9	26.8	21.9	39.0	0.0	14.6
<i>Fits/convulsions</i>	6	(1)	--	--	(1)	--	(4)
<i>Loss of consciousness</i>	29	46.4	0.0	17.8	25.0	0.0	50.0
<i>Excessive bleeding</i>	27	66.7	18.5	3.7	18.5	0.0	25.9
<i>Ruptured uterus</i>	0	--	--	--	--	--	--
<i>Any tear</i>	195	61.0	0.0	3.6	0.0	0.0	39.0
<i>No morbidity</i>	2611	41.1	3.6	3.4	19.6	0.0	53.3

Table 19 continued. Percent of women with intrapartum morbidity and specific intervention*

Morbidity	Egypt N = 4310						
	Women with condition	Drugs %	Cesarean section %	Instrumental delivery %	Episiotomy %	Hysterectomy %	None %
<i>Labor >18 hours</i>	156	58.3	12.8	14.7	27.6	--	26.3
<i>Fits/convulsions</i>	6	(5)	(1)	(1)	(2)	--	--
<i>Loss of consciousness</i>	103	53.4	3.9	12.6	21.4	1.9	34.0
<i>Excessive bleeding</i>	178	59.6	8.4	13.5	21.9	1.1	28.7
<i>Ruptured uterus</i>	13	(7)	(4)	(2)	(2)	(6)	(3)
<i>Any tear</i>	427	50.1	2.6	5.6	14.1	0.2	42.9
<i>No morbidity</i>	3555	38.6	4.0	3.3	8.0	0.0	57.0
	Indonesia N = 1916						
<i>Labor >18 hours</i>	97	nc	28.6	71.4	nc	0.0	na
<i>Fits/convulsions</i>	37	nc	16.7	66.6	nc	16.7	na
<i>Loss of consciousness</i>	--	nc	22.3	44.4	nc	33.3	na
<i>Excessive bleeding</i>	29	nc	26.7	46.6	nc	26.7	na
<i>Ruptured uterus</i>	nc	nc	nc	nc	nc	nc	na
<i>Any tear</i>	nc	nc	nc	nc	nc	nc	na

<i>No morbidity</i>	na						
---------------------	----	----	----	----	----	----	----

Table notes: *Based on women with live or stillbirths. Women may have more than one complication or intervention.

This page left blank intentionally.

Table 20. Specific antepartum morbidities, by outcome of index pregnancy.*

Morbidity	Bangladesh N = 6493		Egypt N = 4522		India N = 3339		Indonesia N = 1926	
	Women with morbidity N	No live birth %						
<i>Edema (hands/ face)</i>	1476	3.7	574	6.6	387	1.8	199	2.5
<i>Bleeding</i>	173	13.3	205	16.1	17	(4)	61	8.2
<i>Fits/convulsions</i>	192	4.7	13	(1)	10	0	18	0
<i>Fever >3 days</i>	1096	4.4	272	9.9	132	11.3	142	0.7
<i>Severe vomiting</i>	1256	3.8	1051	5.0	617	5.0	nc	nc
<i>Hypertension**</i>	235	4.3	718	9.1	34	0.3	nc	nc
<i>Urinary problems</i>	1905	3.7	559	5.7	376	5.6	nc	nc
Non-obstetric morbidity during pregnancy								
<i>Pulmonary TB</i>	22	(1)	10	--	6	--	nc	nc
<i>Malaria</i>	205	3.9	10	(1)	13	(1)	nc	nc
<i>Jaundice</i>	386	4.9	3	--	4	(1)	nc	nc
<i>Rheumatic heart disease</i>	326	2.8	33	18.2	12	--	nc	nc
<i>Varicose veins</i>	473	2.7	331	5.7	44	(1)	nc	nc

Table notes: *Based on all women.

**Based on women whose blood pressure was measured.

For each country, the second column refers only to the subset of women who had the morbidity specified.

Table 21. Specific intrapartum morbidities or interventions, by outcome of index pregnancy.*								
Morbidity	Bangladesh N = 6392		Egypt N = 4309		India N = 3064		Indonesia N = 1916	
	Women with morbidity N	Women with stillbirth %	Women with morbidity N	Women with stillbirth %	Women with morbidity N	Women with stillbirth %	Women with morbidity N	Women with stillbirth %
<i>Labor >18 hours</i>	419	6.2	156	2.6	41	--	97	3.1
<i>Fits/convulsions</i>			6	--	6	(1)	37	--
<i>Loss of consciousness</i>	224**	6.2	103	1.9	29	6.9	0	--
<i>Ruptured uterus</i>	nc	nc	13	(3)	0	--	0	--
<i>Torn vagina/ cervix</i>	98	3.1	427	0.7	195	1.0	0	--
<i>Excessive bleeding</i>	1255	3.2	178	3.4	27	11.1	295	2.7
Interventions								
<i>Cesarean section</i>	11	(1)	182	2.2	168	--	14	28.6
<i>Instrumental delivery</i>	14	(2)	180	3.3	130	0.8	32	9.7
<i>Hysterectomy</i>	nc	nc	8	(2)	0	--	15	(2)

Table notes: * Based on women with live or stillbirths.

** In Bangladesh, "fits/convulsions" and "loss of consciousness" reported together.

For each country, the second column refers only to the subset of women who had the morbidity specified.

Table 22. Specific postpartum morbidities in the index pregnancy,* by outcome of index pregnancy.

Morbidity	Bangladesh N = 6493		Egypt N = 4522		India N = 3339		Indonesia N = 1926	
	Women with morbidity N	Women with stillbirth %	Women with morbidity N	Women with stillbirth %	Women with morbidity N	Women with stillbirth %	Women with morbidity N	Women with stillbirth %
<i>Pelvic pain</i>	3182	3.9	944	1.1	111	1.8	294	3.1
<i>Painful urination</i>	1257	3.9	327	0.9	83	2.4	111	1.8
<i>Excessive bleeding</i>	1137	6.9	153	3.3	55	--	216	4.6
<i>High fever</i>	1080	6.0	668	1.8	142	2.8	258	1.9
<i>Foul smell/discharge</i>	666	5.0	424	1.7	14	7.1	87	4.6
<i>Breast condition**</i>	431	3.7	625	1.1	64	9.4	40	--
<i>Shock/loss of consciousness</i>	292	5.5	89	4.5	26	--	63	6.3
<i>Depression ≥2 weeks</i>	177	22.6	121	2.5	3	33.3	--	--
<i>Depression <2 weeks</i>	431	13.0	36	5.6	4	--	92	6.5
<i>Fits/convulsions</i>	95	7.4	6	--	11	--	20	(5)

Table notes: *Based on all women.

**Breast abscess in Bangladesh and Indonesia, mastitis and cracked nipples in Egypt and India.

Table 23. Percentage of women with morbidities in the index pregnancy, by timing and severity of morbidity.*

Number of morbidities	Bangladesh N=6493			Egypt N = 4522		
	Life threatening	Life threatening or serious	All	Life threatening	Life threatening or serious	All
Antepartum morbidities						
0	92.1	52.7	42.6	95.0	55.7	49.7
1	6.9	27.0	24.5	4.9	29.3	28.0
2	0.9	13.1	16.5	0.1	11.5	14.8
≥3	0.1	7.2	16.4	--	3.5	7.5
Intrapartum morbidities						
0	78.7	73.8	73.4	95.6	92.2	82.2
1	19.9	22.1	22.2	4.4	7.3	15.3
2	1.5	3.7	3.9	0.05	0.5	2.2
≥3	--	0.4	0.5	--	0.05	0.4
Postpartum morbidities						
0	81.6	62.7	34.8	96.2	75.6	54.4
1	17.7	22.9	28.5	3.7	18.6	24.5
2	0.6	10.2	17.7	0.1	5.0	12.9
≥3	--	4.2	19.0	--	0.8	8.2
Ante-, intra-, and postpartum morbidities of the index pregnancy						
0	68.0	34.9	20.1	89.3	44.9	33.1
1	17.3	22.9	19.0	8.5	27.2	20.9
2	11.8	15.8	15.3	1.8	15.6	16.5
3	2.2	11.2	12.2	0.3	7.6	11.7
4	0.6	6.9	9.7	0.05	2.7	7.8
5	0.1	8.2	23.7	--	1.9	10.1

Table 23 continued. Percentage of women with morbidities in the index pregnancy, by timing and severity of morbidity.*

Number of morbidities	India N = 3339			Indonesia N = 1926**		
	Life threatening	Life threatening or serious	All	Life threatening	Life threatening or serious	All
Antepartum morbidities						
0	98.2	74.6	60.0	95.8	80.1	na
1	1.8	20.8	23.1	4.2	17.9	na
2	--	4.4	12.0	--	2.0	na
≥3	--	0.2	4.6	--	0.1	na
Intrapartum morbidities						
0	98.2	89.9	83.6	83.2	79.7	na
1	1.8	7.9	13.0	16.1	18.3	na
2	0	2.6	3.0	0.7	1.7	na
≥3	--	0.5	0.4	--	0.2	na
Postpartum morbidities						
0	98.1	84.1	76.5	88.7	77.0	na
1	1.9	13.7	17.3	10.6	15.8	na
2	0.0	2.1	4.6	0.7	5.4	na
≥3	--	0.1	1.6	--	1.9	na
Ante-, intra-, and postpartum morbidities of the index pregnancy						
0	95.3	54.5	41.7	na	na	na
1	4.3	28.5	25.6	na	na	na
2	0.3	12.2	18.1	na	na	na
3	0.0	3.1	8.9	na	na	na
4	--	1.1	4.0	na	na	na
5	--	0.2	1.8	na	na	na

Table notes: * Based on all women.

** Indonesia's numbers are underestimates, especially for the antepartum period, because questions were not asked about all morbidities.

This page left blank intentionally.

Table 24. Number of long-term morbidities.*								
Number of morbidities	Bangladesh N = 6493		Egypt N = 4522		India N = 3339		Indonesia N = 1926	
	Total women	%	Total women	%	Total women	%	Total women	%
0	4639	71.4	3367	74.5	3065	91.8	1547	80.3
1	1280	19.8	875	19.3	235	7.0	335	17.4
2	416	6.4	218	4.8	36	1.1	36	1.9
≥3	158	2.4	62	1.4	3	0.1	8	0.4
Total	6493	100.0	4522	100.0	3339	100.0	1926	100.0

Table notes: *Based on all women, and can have been caused by other than the index pregnancy.
 Long-term morbidity includes VVF, RVF, incontinence, uterine prolapse, dyspareunia, hemorrhoids.

Table 25. Ratio of morbidities* to maternal mortality.

Ratio	Bangladesh (MMR = 460)			Egypt (MMR = 190)		
	<i>Life threatening**</i>	<i>Life threatening or serious***</i>	<i>All</i>	<i>Life threatening**</i>	<i>Life threatening or serious***</i>	<i>All</i>
<i>Number of antepartum morbidities per maternal death</i>	19.9	175.7	270.0	24.5	331.7	439.9
<i>Number of intrapartum morbidities per maternal death</i>	51.6	69.6	69.6	22.7	94.5	108.8
<i>Number of postpartum morbidities per maternal death</i>	43.0	114.0	304.9	19.5	165.1	418.1
<i>Number of antepartum, intrapartum and postpartum morbidities per maternal death</i>	114.4	259.3	643.4	66.8	591.4	966.9
<i>Number of long-term sequelae per maternal death</i>	--	29.2	91.2	--	41.7	185.8
<i>Number of morbidities (all types) per maternal death</i>	114.4	338.5	734.6	66.8	633.0	1152.7

Table 25 continued. Ratio of morbidities* to maternal mortality.

Ratio	India (MMR = 240)			Indonesia (MMR = 450)		
	<i>Life threatening**</i>	<i>Life threatening or serious***</i>	<i>All</i>	<i>Life threatening**</i>	<i>Life threatening or serious***</i>	<i>All</i>
<i>Number of antepartum morbidities per maternal death</i>	5.7	144.6	294.9	17.6	83.8	na
<i>Number of intrapartum morbidities per maternal death</i>	8.9	68.8	96.7	70.7	85.3	na
<i>Number of postpartum morbidities per maternal death</i>	9.4	86.4	149.4	48.2	97.8	na
<i>Number of antepartum, intrapartum and postpartum morbidities per maternal death</i>	24.0	299.8	541.0	112.0	148.7	na
<i>Number of long-term sequelae per maternal death</i>	--	0.3	45.3	25.1	41.5	na
<i>Number of morbidities (all types) per maternal death</i>	24.0	300.1	586.3	na	na	na

Table notes:*Based on all morbidities to women with live or stillbirths. Each woman can report one or more morbidities in each of the four time periods (antepartum, intrapartum, postpartum, long-term).

**Life-threatening includes malaria, hemorrhage and fits/convulsions at any time in the pregnancy.

***Serious includes the following:Antepartum — edema, hypertension, fever >3 days, severe vomiting, jaundice pulmonary TB.

Intrapartum — labor >18 hours, vaginal or cervical tear.

Postpartum — fever >3 days, shock, foul discharge.

Long-term — vesicovaginal and rectovaginal fistulae.

Table 26. Ratio of women with morbidities* to maternal mortality.

Ratio	Bangladesh MMR = 460			Egypt MMR = 190		
	Life threatening**	Life threatening or serious***	All	Life threatening**	Life threatening or serious***	All
<i>Number of women with antepartum morbidities per maternal death</i>	17.8	107.0	129.9	26.3	233.2	264.2
<i>Number of women with intrapartum morbidities per maternal death</i>	48.2	59.4	60.2	23.2	41.5	93.7
<i>Number of women with postpartum morbidities per maternal death</i>	41.5	84.5	147.6	20.0	128.4	240.0
<i>Number of women with ante-, intra- and post-partum morbidities per maternal death</i>	72.5	147.3	180.7	56.3	290.0	352.1
<i>Number of women with long-term sequelae per maternal death</i>	--	26.7	64.6	--	37.9	134.2
<i>Number of women with morbidities (all types) per maternal death</i>	72.5	153.1	186.1	56.3	296.8	374.2

Table 26 continued. Ratio of women with morbidities* to maternal mortality

Ratio	India (MMR = 240)			Indonesia (MMR = 450)		
	Life threatening**	Life threatening or serious***	All	Life threatening**	Life threatening or serious***	All
<i>Number of women with antepartum morbidities per maternal death</i>	5.0	105.9	166.6	2	316	318
<i>Number of women with intrapartum morbidities per maternal death</i>	7.6	45.7	55.0	1	377	378
<i>Number of women with postpartum morbidities per maternal death</i>	8.1	66.1	98.1	1	575	576
<i>Number of women with ante-, intra- and postpartum morbidities per maternal death</i>	19.5	174.6	238.3	--	908	908
<i>Number of women with long-term sequelae per maternal death</i>	--	0.2	24.5	--	231	231
<i>Number of women with morbidities (all types) per maternal death</i>	19.5	174.8	251.3	--	908	908

Table notes: *Based on all women. Multiple morbidities are not included.

** Life-threatening includes malaria, hemorrhage and fits/convulsions at any time in the pregnancy.

***Serious includes the following: Antepartum — edema, hypertension, fever >3 days, severe vomiting, jaundice pulmonary TB.

Intrapartum — labor >18 hours, vaginal or cervical tear.

Postpartum — fever >3 days, shock, foul discharge.

REFERENCES

- AbouZahr C, Royston E. *Maternal Mortality: A Global Factbook*. Geneva: World Health Organization, 1991.
- Asociación Demografica Salvadoreña and the Centers for Disease Control and Prevention. *Encuesta Nacional de Salud Familiar (FESAL-93)*. Atlanta: Centers for Disease Control and Prevention, 1994.
- Bang RA, AT Bang, M Baitule, et al. High prevalence of gynecological diseases in rural Indian women. *Lancet* 1989;1(8629):85-88.
- Bhatia J, J Cleland. Self-reported symptoms of gynecological morbidity and their treatment in South India. *Stud Fam Plann* 1995; 26,4:203-16.
- Bhatia J, J Cleland. Obstetric morbidity in South India: Results from a community survey. *Soc Sci Med* 1996;43:1507-16.
- DANIDA Terminal Evaluation. Cited in Feruson AF and Co. *Children and Women in Tamil Nadu — A Situation Analysis 1990*. A study conducted for the Government of Tamil Nadu.
- Datta KK, RS Sharma, PMA Razack et al. Morbidity amongst women in Alwar, Rajasthan — a cohort study. *Health and Population — Perspectives and Issues* 1980;3:282-92.
- Demographic and Health Surveys. *National Safe Motherhood Survey 1993*. Calverton, MD: Philippines National Statistics Office, and Macro International Inc, 1994.
- de Graft-Johnson JE. Determinants of maternal morbidity in Bosomtwe-Atwima-Kwanwoma District [of Ghana]. Diss. University of North Carolina at Chapel Hill, 1994.
- Egyptian Fertility Care Society. *The Study of the Prevalence and Perception of Maternal Morbidity in Menoufeya Governorate, Egypt*. Cairo: Egyptian Fertility Care Society, 1995.
- Fauveau V, Stewart K, Khan SA, Chakraborty J. Effect on mortality of community-based maternity-care programme in rural Bangladesh. *Lancet* 1991;338(8776):1183-89.
- Fortney JA. *Reproductive Morbidity: A Conceptual Framework*. FHI Working Paper 95-02. Research Triangle Park NC: Family Health International, 1995.
- Fortney JA. The importance of family planning in reducing maternal mortality. *Stud Fam Plann* 1987;18:109-114.
- Fortney JA, Susanti I, Gadalla S, Saleh S, Feldblum PJ, Potts M. Maternal mortality in Indonesia and Egypt. *Int J Gynecol Obstet* 1988;26:21-32.

Franks AL, Kendrick JS, Olson DR, Atrash HK, Saftlas AF, Moien M. Hospitalization for pregnancy complications, United States, 1986 and 1987. *Am J Obstet Gynecol* 1992;166:1339-1344.

Ibrahim MM, Rizk H, Appel LJ, et al, for the NHP Investigative Team. Hypertension prevalence, awareness, treatment, and control in Egypt. *Hypertension* 1995; 26:886-890.

Maine D, McCarthy J, Ward VM. *Guidelines for Monitoring Progress in the Reduction of Maternal Mortality [A Work in Progress]*. New York: UNICEF Statistics and Monitoring Section, 1992.

Maine D, Ward V, El Tahir AH. *Meeting the Community Halfway: Programming Guidelines for the Reduction of Maternal Mortality*. New York: UNICEF, 1993.

Saleh S. Maternal mortality in Menoufia, Egypt 1981-1983. In Omran A et al, eds. *High Risk Mothers and Newborns: Detection, Management and Prevention*. Thun: Ott Publishers & Printers, 1987.

Stanton C, K Hill, C AbouZahr, T Wardlaw. Modeling maternal mortality in the developing world. Paper presented at the Population Association of America Annual Meeting, New Orleans, LA, May 1996.

Stewart MK, M Festin. Validation study of women's reporting and recall of major obstetric complications treated at the Philippine General Hospital. *Int J Gynecol Obstet* 1995; 48:S53-S66.

Wasserheit JN, JR Harris, J Chakraborty et al. Reproductive tract infections in a family planning population in rural Bangladesh. *Stud Fam Plann* 1989;20:69-80.

World Health Organization. *International Classification of Disease, 9th and 10th Revisions*. Geneva, World Health Organization, 1993.

World Health Organization. *Measuring Reproductive Morbidity. Report of a Technical Working Group; Geneva, 30 August - 1 September 1989*. Geneva: World Health Organization, 1990.

World Health Organization, UNICEF. *Revised 1990 Estimates of Maternal Mortality: A New Approach*. Geneva: World Health Organization, 1996.

Younis N, K Khalil, H Zurayk, H Khattab. *Learning About the Gynecological Health of Women. The Policy Series in Reproductive Health, No. 2*. Cairo: The Population Council Regional Office for West Asia and North Africa, 1994.

Zurayk H, Khattab H, Younis N, et al. Concepts and measures of reproductive morbidity. *Health Trans Rev* 1993;3(1):17-40.

Zurayk H, Younis N, Khattab H. *Rethinking Family Planning Policy in Light of Reproductive Health Research. The Policy Series in Reproductive Health, No. 1.* Cairo: The Population Council Regional Office for West Asia and North Africa, 1994.

Other Readings

Campbell OMR, Graham WJ. *Measuring Maternal Mortality and Morbidity: Levels and Trends.* London: London School of Hygiene and Tropical Medicine, 1990.

Campbell OMR, Graham WJ. *Measuring the Determinants of Maternal Mortality and Morbidity: Defining and Selecting Outcomes and Determinants and Demonstrating Associations.* London: London School of Hygiene and Tropical Medicine, 1991.

Chamrathirong A, Singhadej O, Yoddumnern-Attig B. The effect of reduced family size on maternal and child health: The case of Thailand. *World Health Stat Q* 40:54-62

Filippi VGA, Graham WJ, Campbell OMR. *Utilizing Survey Data on Maternity Care in Developing Countries: An Illustrative Study.* London: London School of Hygiene and Tropical Medicine, 1991.

Graham WJ, Campbell OMR. *Measuring Maternal Health: Defining the Issues.* The World Bank, Population and Human Resources Department, 1991.

Graham WJ, Campbell OMR. *Measuring the Effectiveness of Maternal Health Programs.* London: London School of Hygiene and Tropical Medicine, 1991.

Graham WJ, Filippi VGA. *Monitoring Maternal Health Goals: How Well Do the Indicators Perform?* London: London School of Hygiene and Tropical Medicine, 1994.

Liljestrand J. *Maternal Mortality in Mozambique.* Diss. Uppsala: Faculty of Medicine, University of Uppsala, 1985.

McCarthy J, Maine D. A frame work for analyzing the determinants of maternal mortality. *Stud Fam Plann* 1992;23(1):23-33.

Omran AR, Standley CC. *Family Formation Patterns and Health.* Geneva: World Health Organization, 1976.

Omran AR, Standley CC. *Family Formation Patterns and Health: Further Studies.* Geneva: World Health Organization, 1981.

Rowley J. A death every minute. *People* 1987;14(3):3-7

Taylor R, Whitmore J, Robertson S, et al. *Report of the Niue Women's Health Survey (1983), Technical Paper #187*. Noumea, New Caledonia: South Pacific Commission, 1985.

Thaddeus S, Maine D. *Too Far to Walk: Maternal Mortality in Context — Finding from a Multidisciplinary Literature Review*. New York: Columbia University Center for Population and Family Health, 1990.

