Promoting Quality Maternal and Newborn Care:

A Reference Manual for Program Managers






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PROMOTING QUALITY MATERNAL AND NEWBORN CARE:

A REFERENCE MANUAL FOR PROGRAM MANAGERS

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CARE®

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IN LOVING MEMORY

"Never doubt that a small group of thoughtful,

committed citizens can change the world;

indeed it's the only thing that ever does."

– Margaret Mead

Jennifer Mukolwe and Bonnie Pedersen were two women who devoted their lives to improving the life conditions of their fellow sisters. ***Jennifer***, a Kenyan by birth, spearheaded an initiative to provide community-based family planning services in several Kenyan NGOs. This was a radical idea at its inception but is now viewed as a model throughout Africa. In the early 1990s Jennifer moved to Uganda to become one of CARE's first family planning project managers. Over the six years under Jennifer's guidance, the program blossomed. ***Bonnie***, an American midwife, practiced in many remote areas of the United States before launching the Special Projects division of the American College of Nurse-Midwives. These special projects worked with midwifery associations in Ghana, Uganda, Bangladesh and Sierra Leone to strengthen their technical skills and organizational capacity. For the past ten years, Bonnie provided outstanding leadership at USAID to strengthen the technical capacity and quality of family planning programs worldwide while advancing the reproductive health rights of women by ensuring that their issues were heard.

Both Jennifer and Bonnie faced many obstacles throughout their lives, but they never lost sight of the goal to make the world a better place for all women and children. They were both remarkable women and I admired their zest for life and passion for their work. They were great people; always greeting their friends with big smiles and warm hugs. I am privileged to have known both and we shall miss them very much.

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I would also like to acknowledge all my colleagues at CARE in the Health and Population Unit who have supported and provided valuable input for this manual.

"As a woman I have no country.
As a woman my country is the whole world."

– Virginia Wolfe

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PREFACE

There is scene from the Bible that comes to mind when I think about women, motherhood and the world today. It is the scene of the Egyptian maid, Hagar, bearing the child of Abram, sitting lonely and desperate in the wilderness, where the angel of the Lord found her and said unto her: "Thou art with child and the Lord hath heard thy affliction." In today's world, millions of women are found lonely and desperate in the wilderness of neglect and the darkness of social injustice; and when they are with child, their loud screams often go unheard. Let us vow that we will see to it that no woman with child will be left alone in the wilderness of neglect or despair.

– Dr. Mahmoud Fathalla
World Health Day, April 7, 1998

In every culture and as far back as history records, the joy and pain of childbirth are embedded in our history. Like many other organizations, CARE's goal is to help women experience healthy, joyous pregnancies and prevent the tragedy of maternal mortality and morbidity. CARE has a long and rich history of assisting communities and governments in providing maternal health care dating back to the 1950's. As the first Decade of Safe Motherhood closed, CARE conducted a strategic review of its maternal and neonatal health portfolio, with the aim of achieving significant improvements in the scope and quality of our programming. This document was developed as one mechanism towards achieving this goal. It's designed to be a user-friendly synthesis of the latest literature and lessons learned from a variety of countries for program managers. We hope that sharing this experience with the concerned community of policy-makers, programmers and practitioners, will contribute to better care for mothers and newborns in the near future.

We recognize that maternal health cannot be abstracted from the concrete reality of women's lives. Maternal health programs are unlikely to succeed if women continue to suffer from poverty, malnutrition, lack of schooling opportunities, the inability to control their fertility, limited participation in household decision-making processes, and/or abuse or violence. **We believe that true development requires that women gain mastery of their lives, which demands a holistic approach to their needs.**

CARE strives to improve women's lives through comprehensive programming. Our maternal health programs are generally implemented in some combination with reproductive health care, children's health care, basic education/literacy for women and girls, food supplementation and nutrition, access to credit and savings, income generation, water and sanitation, and emergency relief programs, where women are often the most vulnerable.

CARE works towards promoting maternal and neonatal health as well as reducing maternal and neonatal morbidity and mortality. We have embraced an approach that encompasses:

1. comprehensively assessing the local situation;

2. identifying locally defined barriers to accessing maternal health services; and

3. strategically selecting the most critical interventions, in cooperation with local partners, for implementation in the community and health systems.

Preventing maternal and neonatal morbidity and mortality is a complex task. It requires new behaviors by mothers and their partners, community mobilization, and increased use of high quality maternal health services at all levels. Often, this will mean re-thinking gender roles, with women gaining greater access to resources and authority. In addition to new behaviors, accessing maternal health services depends on an interdependent chain of events, all of which must function well, and many of which must function simultaneously. A single failure in the chain can result in death and/or disability, even if all of the other pieces are functioning properly. Households members, communities, health providers, program managers, and policy-makers must act in concert to bring about sustained change.

Maternal health is an evolving science. In the following pages, we discuss the elements of a comprehensive maternal health system, which we believe is needed to achieve significant reductions in mortality and morbidity, based on the currently available information.

Now is the time to act – to forge and strengthen partnerships – to address this serious and complex problem. At CARE, we look forward to collaborating with you to work towards our shared goal of reducing maternal and neonatal mortality and morbidity.

TEN YEARS LATER – WHERE ARE WE?

- ➔ An **integrated approach** to maternity care is essential. Community and facility-based services need to be linked and supported by adequate logistics and information systems.

- ➔ Communication strategies need to effect **behavior change** of health care seekers, decision-makers, and providers.

- ➔ "Risk screening" as previously practiced is not as effective in identifying women that may develop obstetrical complications as previously believed. **Early identification and treatment of complications may be more appropriate.**

- ➔ **The majority of maternal deaths (45%), occur during the first 24 hours after delivery.**

- ➔ Every year **3.3 million newborns die in the first week of life** and another **4.3 million are stillborn.** Many of these deaths are directly related to poor maternal health and management of childbirth.

- ➔ In the developing world, **most births (63%) occur at home** and about **60 million women deliver without any assistance from a trained attendant.**

- ➔ It is estimated that **one third of maternal deaths (175,500)** could be prevented by avoiding unwanted pregnancies through family planning.

- ➔ **TBAs have an important role in childbirth but they cannot, by themselves, reduce maternal mortality** without appropriate linkages and back-up services to address complications as they arise.

CHALLENGES FOR THE NEXT DECADE

- **Improve women's participation in decision-making,** including the number and timing of children, access to health care services and control of resources.

- **Empower women and their families to adopt healthy behaviors:** plan for births and complications if they arise, including recognition of danger signs, know the location of an appropriate health facility that can provide obstetric services, know how to get to the facility and have resources to pay for the services.

- **Encourage men** to support/promote women's access to reproductive health services.

- Continue to support successful family planning and maternal health programs, and **scale up small pilot projects to the national level.**

- **Increase the number of births attended by skilled providers.**

- Work to ensure that all the **essential linkages needed for an effective referral system** are in place, including adequate transportation systems, resources to pay for services and accessible obstetric services.

- Communicate specific messages to promote and sustain **behavior change** in a culturally acceptable manner. Messages should empower women and their families to demand that services be available and reflective of the communities' needs.

- Ensure access to **"Mother Friendly"** obstetric services, **24 hours a day**,with adequate drugs, supplies, equipment, and skilled personnel that can provide quality services in a culturally and women-sensitive manner.

- Work to ensure that services meet the special needs of **adolescents,** women suffering from abuse and violence, and complications of unsafe abortions.

- Develop **better indicators** and measuring systems to document progress in reducing maternal deaths, morbidities, and newborn deaths.

- Increase/sustain government and **political support and resources** for maternal health programs.

INTRODUCTION

Why Was The Manual Written?

We are pleased to share with you this technical reference manual. As a result of the end of the first Decade of Safe Motherhood, CARE conducted a strategic review of its maternal health portfolio and found that this was an excellent opportunity to upgrade our skills and programming in maternal and neonatal health. This manual is one avenue for achieving this goal. It was written to provide a synthesis, and a melding, of the latest literature together with lessons learned from programs in the field in a user-friendly format. The manual is intended to assist program managers in the field to better design, select effective interventions, implement, monitor, and evaluate their maternal health programs.

Who Is The Manual Written For?

The primary audiences for this manual are regional or district level health professionals, PVO/NGO project managers, and other programmers in developing countries. It may also be useful for Ministry of Health officials, NGO/PVO headquarters staff, technical staff of international donor agencies, as well as serve as a supplemental training manual for medical and public health professionals.

What Is The Focus Of The Manual?

Although women in urban areas also have problems accessing maternal health services, the difficulties are usually more pronounced in the rural areas, which are the primary focus of this manual. (Note: The general principles are the same). We believe that the responsibility for improving maternal and neonatal health lies with the health personnel, the communities and the women in the developing world. Our role is to provide them with adequate information and skills to realize their potential. Partnership, at various levels, is an essential and a pervasive theme throughout the manual. While the manual tries to give a synthesis of the literature and potential solutions, it must be stressed that most of the factors described vary by country and the regions within countries. Each setting must be assessed individually, and the interventions selected need to be adapted to reflect local needs and conditions.

What Does The Manual Have To Offer?

The aim of this manual is to serve as a reference that summarizes the latest literature and lessons learned in a user-friendly format for program managers in developing countries. The manual can be used in many ways. Some readers may want to read it straight through, while others may prefer to only read specific chapters. While it is not a *training* manual, it refers to many training materials that can be obtained. It may be a useful reference manual for professional organizations or schools wishing to supplement their curriculum. There is a large reference list arranged by subject and some readers may find this useful in looking for more information.

CHAPTER OVERVIEWS

This manual tries to present a balanced discussion of the (controversial) issues with enough information so that the reader can see varying perspectives and approaches and apply them in their own setting.

CHAPTER ONE – describes the magnitude of the problem, the causes of maternal and neonatal mortality and morbidity, both medical and social, and the concept of lifetime risk.

Why Women and Newborns Die

CHAPTER TWO – outlines the factors that influence maternal and neonatal mortality and morbidity before the woman becomes pregnant. These factors are low women's status, poor nutrition, poverty, lack of education, and violence against women.

Prepregnancy Factors

CHAPTER THREE – illustrates the factors that affect maternal and neonatal morbidity and mortality while a woman is pregnant. These factors are: beliefs and practices, nutrition during pregnancy, birth planning, antenatal care services, childbirth, the "four delays" in accessing quality maternal health services, post-partum care, and newborn care.

Pregnancy-related Factors

CHAPTER FOUR – presents three components (design, monitoring, evaluation) in the same chapter to facilitate consideration of monitoring and evaluation during the design process. This will assist programmers in thinking through their program strategies in a more comprehensive manner. Contents included are: what we have learned, future challenges, methodologies to assess the health situation, program considerations, measurement of maternal mortality by proxy indicators, and CARE's strategic framework.

Program Design, Monitoring and Evaluation

CHAPTER FIVE – offers strategies and interventions to address the "four delays" in receiving quality maternal care. The "Current Best Practices" are intended to assist program managers and frontline health workers to better understand the essential components of the services they provide. It may also assist community mobilization efforts to determine which areas to focus on, as well as key issues and messages. There are several useful tables that may be included in training programs. Topics include: partnerships, health education, community mobilization, improving services, obstetric first aid, essential obstetric services, addressing the "four delays", human resources development, antenatal practices and services, post-partum care, post-abortion care, and newborn care.

Interventions and Current Best Practices

CHAPTER SIX – presents specific activities, results, and lessons learned from country programs. It is organized by: overall programs involving several interventions, training of TBAs, community programs, obstetric services, newborn care, and policy. Each section has a description of the activities undertaken, the implementation successes and failures, and the results achieved.

Lessons Learned Through Country Programs

Acronym List

ACNM	American College of Nurse-Midwives
AGI	Alan Guttmacher Institute
AGW	Aganwadi Worker
AIDS	Acquired Immunodeficiency Syndrome
ALRI	Acute Lower Respiratory Infection
AVSC	Association of Voluntary and Safe Contraception
BCG	Bacillus Calmette Guerin
BIRPERT	Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies
BP	Blood Pressure
BSOG	Bangladesh Society of Obstetricians and Gynecologists
CARE	Cooperative for Relief and Assistance Everywhere
CFR	Case Fatality Rate
CIDA	Canadian International Development Agency
CPD	Cephalopelvic Disproportion
CPR	Contraceptive Prevalence Rate
DALY	Disability Adjusted Life Years
DH	District Hospital
EmOC	Emergency Obstetric Care
EOC	Essential Obstetric Care
FGM	Female Genital Mutilation
FHH	Female Headed Household
FHI	Family Health International
FP	Family Planning
GDP	Gross Domestic Product
Hb	Hemoglobin
HHLS	Household Livelihood Security
HIV	Human Immunodeficiency Virus
ICDDR,B	International Centre for Diarrheal Disease Research, Bangladesh
IEC	Information, Education and Communication
IGA	Income Generation Activities
IFA	Iron Folate Tablets
IMR	Infant Mortality Rate
INCAP	Institute of Nutrition of Central America and Panama
IU	International Units
IUGR	Intrauterine Growth Retardation
IV	Intravenous
LAC	Latin America and the Caribbean
LBW	Low Birth Weight
MC	Medical College
mcg	microgram
MCH	Maternal and Child Health
mg	milligram
MHH	Male Headed Household
MMR	Maternal Mortality Ratio
MOHFW	Ministry of Health and Family Welfare
MTCT	Maternal To Child Transmission of HIV
NGO	Non-Governmental Organization
NMR	Neonatal Mortality Rate
ORS	Oral Rehydration Salts
PEM	Protein Energy Malnutrition
PIH	Pregnancy Induced Hypertension
PLA	Participatory Learning in Action
PMM	Prevention Of Maternal Mortality Network
PNMR	Perinatal Mortality Rate
po	by mouth, orally
PPH	Post-Partum Hemorrhage
PRA	Participatory Rural Appraisal
RPR	Reactive Plasma Reagents
SGA	Small for Gestational Age
SP	Sulfadoxine-Pyrimethamine
STI	Sexually-Transmitted Infections
TBA	Traditional Birth Attendant
TFR	Total Fertility Rate
THC	Thana Health Complex
TT	Tetanus Toxoid
UNFPA	United Nations Fund For Population Activities
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VAD	Vitamin A Deficiency
VCTC	Voluntary and Confidential Testing and Counseling
VHW	Village Health Worker
VVF	Vesico-Vaginal Fistula
WHO	World Health Organization
WRA	Women of Reproductive Age
ZDV	Zidovudine

1

WHY WOMEN AND NEWBORNS DIE

Every day, at least 1,600 women die from complications of pregnancy and childbirth. That is 585,000 women – at a minimum – dying every year. The majority of these deaths – almost 90 percent – occur in Asia and Sub-Saharan Africa. Between 25 and 33 percent of all deaths among women of reproductive age in developing countries result from complications of pregnancy and childbirth. In addition, there are almost 8 million newborns (4.3 stillbirths and 3.3 neonatal deaths) that die late in pregnancy or shortly after birth.

– World Health Day Safe Motherhood Press Packet

I. MATERNAL MORTALITY, MATERNAL MORBIDITY, AND NEWBORN DEATHS

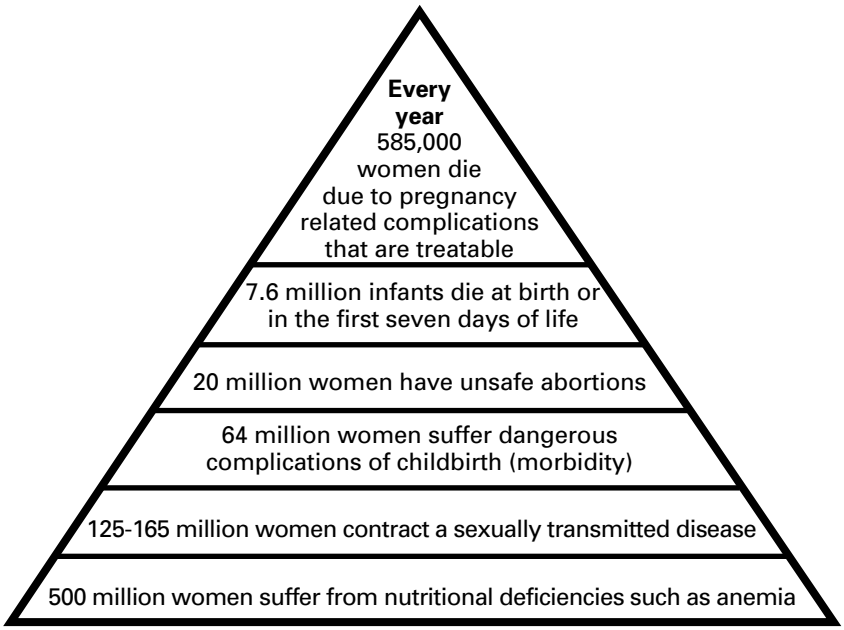
Pregnancy is usually considered a healthy state and a cause for joy in a family. The majority of pregnancies proceed without difficulties and many women do not even realize that pregnancy can be a potential risk to their health. ***However, 40 percent of pregnant women experience some form of pregnancy-related complication(s) and 15 percent of all pregnant women develop a life threatening complication(s) requiring obstetric care[(1)].*** Eighty-five percent of all maternal deaths result from five main causes: post-partum hemorrhage, unsafe abortion, sepsis, obstructed labor, and pregnancy-induced hypertension (PIH) disorders, such as pre-eclampsia. Indirect causes such as anemia and malaria account for about 15 percent of maternal deaths[(1)].

Therefore, the Safe Motherhood Initiative was launched a decade ago (1987) in Nairobi to promote awareness and bring the international community together to facilitate a plan of action to address this complex problem. This initiative has been greatly supported by other important international conventions. At the 1990 World Summit for Children, 166 countries signed a Declaration Plan of Action with one of the seven goals being to reduce maternal mortality by 50 percent by the year 2000. At the 1994 International Conference on Population and Development in Cairo there was general consensus that women need to be addressed in a holistic manner if human development objectives were to be achieved. The Programme of Action endorsed "the right of access to appropriate health care services that will enable women to go safely through pregnancy and childbirth as well as the woman's right to choose the number and timing of her children[(1)]".

Eight countries – Bangladesh, Ethiopia, India, Indonesia, Nepal, Nigeria, Pakistan and Uganda – account for the majority of maternal deaths worldwide.

Figure 1.1 outlines the magnitude of maternal and neonatal mortality and morbidity. If the statistics in Figure 1.1 are calculated for the last decade, ***6 million women*** have died from pregnancy-related complications and another ***640 million women*** have suffered significant illnesses/injuries (pregnancy-related morbidities). These women are not old or sick; they are in the prime of their lives and are the fabric of their culture. In addition, ***76 million infant*** deaths have occurred, largely due to poor maternal health and/or birth complications.

FIGURE 1.1:
MAGNITUDE OF MATERNAL AND NEWBORN HEALTH PROBLEMS



Source: MotherCare Matters, 1997; WHO, 1998

Maternal deaths result from a combination of social factors, medical causes, and systemic failures that lead to maternal and neonatal mortality and morbidity.

So why do so many women and newborns die? Some countries have been able to apply a combination of simple interventions that are available and affordable to reduce maternal deaths. Then, why are these practices not more widespread? ***"Because nobody knows…nobody cares…and nobody prepares[2]."*** **Not enough people know how serious the problem of pregnancy-related complications can be, or that there are effective solutions to address it.** This is true for both maternal and neonatal mortality and morbidity. Not enough people – policy makers, programmers, planners, and health providers – who have the power and resources to address the situation, think that reducing maternal and newborn deaths is a priority. Furthermore, not enough people – community leaders, household decision-makers – and women themselves – are aware of the danger signs and actions needed to access care. The need exists to plan for these complications and ensure that prompt actions are taken to seek health services, if complications occur[2].

Maternal deaths result from a combination of social factors, medical causes and systems failures that lead to maternal and neonatal mortality and morbidity. These factors, which vary by context and culture, are presented in Table 1.1 and are discussed further in Chapters 2 and 3.

TABLE 1.1
RELATIONSHIP BETWEEN FACTORS CONTRIBUTING TO MORTALITY AND MORBIDITY

MEDICAL CAUSES

MATERNAL DEATHS
Post-Partum Hemorrhage
Obstructed Labor
Unsafe Abortion
Sepsis
Pregnancy-Induced Hypertension

STILLBIRTHS
Syphilis

NEWBORN DEATHS
Sepsis
Tetanus
Birth Asphyxia

SYSTEM FAILURES

ANTENATAL
Inadequate Screening
Poor Record Keeping
Poor Birth Planning
Difficulty Identifying Danger Signs
Poor Counseling Skills

CHILDBIRTH
Poor Referral System
Inadequate Equipment
Untrained Staff
24 Hr. Services not Available
Lack Privacy
Culturally/Traditionally Insensitive Services

POST-PARTUM
Inadequate monitoring in the first week post-partum of mother and newborn.

MATERNAL AND NEONATAL MORTALITY

SOCIAL FACTORS

PROBLEM RECOGNITION
Lack of Accurate Information
Reliance on Traditional Medicine
Traditional Practices
Perceive Danger Signs as Normal

DECISION-MAKING
Low Women's Status
Lack of Birth Planning
Birth Attended by Unskilled Providers
Poor Perception of the Health Care System

ACCESS
Transport
Resources

Source: UNICEF, 1996; Jafarey

Progress in terms of maternal health, at the impact level, is usually discussed in terms of Maternal Mortality Ratio and/or Maternal Mortality Rate. There is often some confusion regarding these terms. Although both refer to the number of women who die while pregnant or within the first 42 days after pregnancy, the denominators are different. The rate is compared to women of reproductive age (WRA) while the ratio is compared to live births. Maternal mortality ratio is the more commonly used term. For the purposes of this report, MMR will refer to Maternal Mortality Ratio *(See Glossary)*.

Both Maternal Mortality Rate and Ratio are difficult to measure because they require large sample sizes to detect changes over time. Therefore, it is not practical for programs, especially small-scale programs, to be held accountable to this level. It may be appropriate for a country level exercise once every 4 or 5 years, to measure the sum of several efforts. Proxy measures can be used, such as unmet need for obstetric services, although better indicators are still needed. (See Chapter 4, Table 4.4, for illustrative indicators.)

Perinatal mortality rate (PNMR) is the number of deaths among fetuses late in pregnancy and newborns in the first seven days of life. Neonatal mortality rate (NMR) is the number of newborn deaths in the first month of life. These rates measure progress in terms of infant health *(See Glossary)*. It has been proposed that perinatal mortality might be a good proxy indicator of maternal mortality, however, this doesn't appear to be the case. Several other factors influence perinatal mortality that have no association with maternal mortality.

A. Maternal Mortality

Maternal deaths exemplify the large disparities between the developed and developing world (See Table 1.2). Excluding China, three countries – India, Bangladesh and Pakistan – account for 28 percent of the world's births and 46 percent of maternal deaths. Similarly, while only 11 percent of women of reproductive age live in Africa, they account for 40 percent of the world's maternal deaths. **In many developing countries, maternal deaths account for up to 25 percent of all deaths among women of reproductive age[1].**

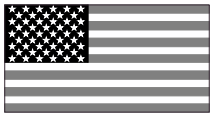
TABLE 1.2
MATERNAL DEATHS BY REGION

REGION	TOTAL DEATHS	MATERNAL MORTALITY RATIO (per 100,000 live births)
Europe	3,000	36
America	23,000	140
(Latin America)	(included in America)	270
Central Asia	14,000	560
Asia	291,000	390
Middle East and North Africa	35,000	340
Africa	219,000	1000
Total	**585,000**	**N/A**

Source: UNICEF/WHO, 1996

FIGURE 1.2

DIFFERENT WORLDS



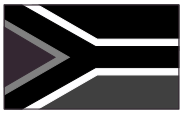
DEVELOPED WORLD

The average woman in the U.S. or Europe:

- ➔ attends at least 10 antenatal sessions with a skilled provider;
- ➔ maintains a healthy diet, and;
- ➔ plans her birth, including an institution-based delivery with a skilled provider.

Most women in the U.S. deliver in a health facility, so if a complication arises it is easy to treat. If she has not yet reached the health institution and a complication arises, most women:

- ➔ know the danger signs and can make the decision to get help;
- ➔ know where to go to get help and can call a taxi or an ambulance that will arrive in 30-45 minutes, and;
- ➔ when she arrives at the hospital she is treated promptly by trained personnel and a health care system that is well-equipped to deal with her emergency.



DEVELOPING WORLD

In contrast, the average African or Asian woman:

- ➔ attends one or two antenatal visits with a skilled provider;
- ➔ may not have money to eat a proper diet, and she works long hours in the field;
- ➔ may have an infectious disease that is not properly treated during her pregnancy (e.g., malaria); and
- ➔ usually does not plan much for the delivery.

Most women in the developing world will usually deliver at home with help from her mother-in-law or an older woman in the community.

If a complication arises, most women:

- ➔ do not know the danger signs and do not recognize them very early;
- ➔ do not know where to go to access care and will need their husband's permission to travel to a facility that may be hours away; and
- ➔ have difficulty finding transportation and funds to pay for obstetric services.

If she does make it to a health facility, she may have to wait many hours before they find a health provider who may or may not have the training or the medications to adequately manage a complication.

It is estimated that between 75 and 85 percent of all maternal deaths result from five main medical causes: post-partum hemorrhage (PPH); unsafe abortion; sepsis; obstructed labor; and pregnancy-induced hypertension (PIH) disorders, such as pre-eclampsia. Indirect causes such as anemia and malaria account for about 15 to 20 percent of maternal deaths[4].

Table 1.3 presents each condition with a range of its contribution to the overall number of maternal deaths, from several sources. In order to design and implement effective programs that address the primary causes of maternal mortality and morbidity, the focus needs to be on the relative importance of each condition (e.g., post-partum hemorrhage) rather than the numbers per se.

TABLE 1.3
MAJOR CAUSES OF MATERNAL DEATHS

CAUSE	ESTIMATED PERCENTAGES	ESTIMATED DEATHS/YEAR
Hemorrhage	25-31%	146,250 – 163,800
Unsafe Abortion	13-19%	76,050 – 111,150
(PIH) Hypertension	10-17%	58,500 – 99,450
Obstructed Labor	11-15%	64,350 – 87,750
Sepsis	11-15%	64,350 – 87,750
Other Obstetric Complications	6 - 8%	35,100 – 46,800
Indirect Causes	15-20%	87,750 – 117,000

Source : WHO, 1991; UNICEF, 1996

For years, the medical community has recommended a post-partum visit six weeks after delivery, and most programs are based on this recommendation. This visit is primarily for women to get information about family planning (FP) and begin their child's immunizations. It is too late to identify complications, for either the mother or the newborn, that lead to mortality.

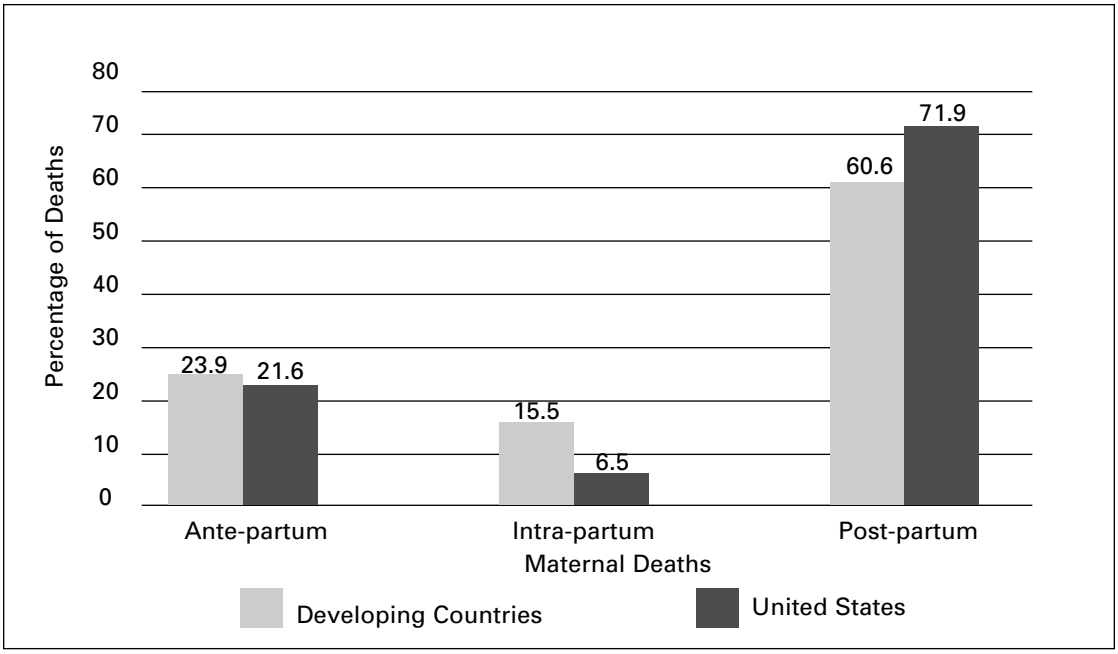
TABLE 1.4
INTERVAL FROM ONSET TO DEATH
FOR MAJOR OBSTETRIC COMPLICATIONS

COMPLICATION	HOURS	DAYS
Hemorrhage		
Postpartum	2	
Ante-partum	12	
Ruptured Uterus		1
Eclampsia		2
Obstructed Labor		3
Infection		6

Source: Li, F., 1996

Studies have recently found that the majority of maternal deaths (60%) occur in the first week after delivery. Forty-five percent of deaths occur within the first 24 hours after delivery, and an additional 23 percent occur two to seven days after delivery as shown in Table 1.4[3]. Unfortunately, care during this critical time period has been neglected in many parts of the world.

TABLE 1.5
MATERNAL DEATHS BY TIME PERIOD



Source: Li, F., et al, 1996

Researchers found that the highest MMRs for the post-partum period were for:

Women between the ages of 35-44 due to

- complications of abortion (268/100,000); and
- post-partum hemorrhage (224/100,000).

Women between 15-19 years of age with

- PIH (127/100,000)
- complications of abortion (119/100,000); and
- post-partum hemorrhage (110/100,000)[3].

This poses a major challenge to the health system, especially in settings where the majority of births take place at home. These women often die at home without ever seeing a skilled provider.

B. Maternal Morbidity

Maternal mortality is just the tip of the iceberg. In addition to the 585,000 women who die annually, about 64 million women are affected by debilitating injuries and chronic illnesses resulting from pregnancy-related complications[1]. Maternal morbidities vary in severity, and include fistulas, lacerations, anemia, uterine prolapse, damage to bladder or urethra, pelvic or urinary tract infections, and infertility.

It was previously thought that the worldwide ratio of maternal morbidities to mortality was about 30 to 1. However, a study conducted by Family Health International (FHI) demonstrated that maternal morbidities were much more common than previously thought. In Egypt, there were 1000 episodes of illness for every maternal death; 700 in Bangladesh; 600 in India[5].

Research has clearly documented that maternal morbidities, such as anemia, reduce economic and domestic productivity and compromise quality of life. Poor health reduces a woman's capacity to carry out her domestic, economic and reproductive responsibilities. Studies of Sri Lankan tea workers and Chinese cotton mill workers have documented a reduction in productivity resulting from iron deficiency anemia. These studies have also confirmed the positive effects of iron supplementation[6].

One of the most chronic injuries is vesico-vaginal fistula (VVF) where there is a tear between the vagina and the bladder, allowing urine to leak into the vagina rendering the women infertile and often resulting in a stillbirth.

An estimated 1.5 to 2 million women in Africa have VVF and about 50,000 to 100,000 new cases occur each year. These women, who are usually very young, are often social outcasts due to their infertility. In Nigeria they are forced to live in "urine houses", homes for women with fistulas, because their husbands or families no longer want them.

Another common injury is uterine prolapse, where the uterus protrudes into the lower part of the vagina as a result of weakening uterine ligaments. In rural Egypt, a community-based study found that at least half of all women suffered from uterine prolapse[6]. Both of these conditions are easily treated with surgical procedures. However, many women have to endure these conditions because they do not have access to quality reproductive services and/or because their families do not want them to be hospitalized for treatment.

C. *Effects of Poor Maternal Health Care on Infants, Children, and Families*

In developing countries, a mother's death in childbirth means almost certain death for the newborn and severe consequences for older children. When women die in childbirth or as the result of unsafe abortions, they leave behind an estimated two million children each year, whose chances for survival are greatly diminished.

The death of a mother is especially difficult on older daughters who must assume maternal responsibilities, regardless of their ages. They often have to leave school to run the household, tend to younger siblings, or look for paid employment. One study in Bangladesh found that the death rates of girls without mothers were higher than those of motherless boys. Death rates for girl children were about 40/1,000 if both parents were living, but rose to 175/1,000 when the mother died. In contrast, deaths of boys were 25/1,000 if both parents were living and 75/1,000 if the mother died[6].

Women's health and nutritional status is a national, family, and individual concern because it greatly affects the next generation. The death of a woman between the ages of 15 and 45 has significant economic and social consequences for her family and for society as a whole. In most societies, women manage the household, prepare the meals, maintain the living quarters and care for the children, grandparents and other family members. Women often work in the fields, tend to livestock and collect water and firewood. Many women also contribute directly to the household's monetary income. One study showed that 25 percent of households depend on the women for at least half of their income[6].

An estimated 4.3 million stillbirths and 3.3 million neonatal deaths occur annually. Three countries – India, Bangladesh, and Pakistan – account for 37 percent of the world's neonatal deaths.

D. *Perinatal and Neonatal Mortality*

Pregnancy involves a dyad of the mother and the fetus. Poor maternal health directly affects perinatal and neonatal mortality rates. Every year almost 8 million newborns die late in pregnancy, at birth, or soon after as a result of poor maternal care or inadequate management of pregnancy-related complications. An estimated 4.3 million stillbirths and 3.3 million neonatal deaths occur annually although this number is based on 40% underreport. Three countries – India, Bangladesh, and Pakistan – account for 37 percent of the world's neonatal deaths[7]**.** Perinatal mortality in Asia is due to three main factors:

1. poor maternal health and nutrition (37%);
2. poor management of obstetric complications (21%); and
3. unknown causes (22%)[7].

With the great achievements made in immunization and childhood disease control programs, postnatal deaths (2-12 months) have decreased while **neonatal deaths (first month) have increased, as a proportion of total infant deaths. For example, in Nepal, neonatal mortality accounts for 66 percent of all the infant deaths and the majority of these, two-thirds, occur in the first seven days of life[11].**

Ninety-six percent of neonatal deaths occur in the developing world. The highest neonatal mortality rate is 51 per 1,000 live births in South Asia where more than two million neonatal deaths occur annually[11]. Table 1.6 presents the regional differences in these rates. Table 1.7 presents the countries with the highest PNMR.

TABLE 1.6
PERINATAL AND NEONATAL MORTALITY BY REGION

REGION	PERINATAL MORTALITY	NEONATAL MORTALITY
Asia	53/1,000 Births	51/1,000
Africa	75/1,000 Births	42/1,000
LAC	39/1,000 Births	25/1,000

Source: Stoll, B., 1996

TABLE 1.7
HIGHEST PERINATAL DEATHS BY COUNTRY

PERINATAL DEATHS 70-90 PER 1,000 BIRTHS*	PERINATAL DEATHS 90-110 PER 1,000 BIRTHS*	PERINATAL DEATHS 110 OR HIGHER PER 1,000 BIRTHS*
Bangladesh	Angola	Guinea
Benin	Afghanistan	Liberia
Burkina Faso	Bhutan	Somalia
Cameroon	Central African Republic	
E. Guinea	Ethiopia	
Eritrea	Gambia	
Guinea Bissau	Mali	
Haiti	Mauritania	
Laos	Mozambique	
Malawi	Nigeria	
Nepal	Niger	
Pakistan		
Senegal		
Sierra Leone		
Togo		
Uganda		
Yemen		
Zambia		
Zaire		

*Births are stillbirths plus deaths in the first seven days of life.
Source: WHO, 1997

WHO estimates that 85 percent of newborn deaths are due to infections, including sepsis, pneumonia and tetanus, birth asphyxia, and birth injuries[9] (See Table 1.8). Maternal infections during pregnancy, such as malaria and sexually transmitted infections (STIs), especially syphilis and HIV, have a negative effect on neonatal outcomes. (See Chapter 1, Section IV for further discussion.)

TABLE 1.8
CAUSES OF NEONATAL DEATHS

CAUSE OF DEATH	NUMBER OF DEATHS	PERCENTAGE
Birth Asphyxia	840,000	21
Birth Traumas	420,000	11
Neonatal Tetanus	560,000	14
Sepsis	290,000	7
Pneumonia	755,000	19
Diarrhea	60,000	2
Prematurity	410,000	10
Congenital Anomalies	440,000	11
Other	205,000	5

Source: WHO, 1994

There are almost 500,000 cases of neonatal tetanus annually which occur mostly in 12 countries:

Bangladesh; China; Ethiopia; Ghana; India; Indonesia; Nepal; Nigeria; Pakistan; Somalia; Sudan; and Zaire.

The underreporting of perinatal and neonatal deaths is a serious problem in the developing world (at least 40%). Vital registration systems for documenting these events are inadequate in many countries, particularly where definitions are unclear and a stillbirth may be socially stigmatizing. Furthermore, in many countries, a newborn is not recognized until it survives a period of time which ranges from one week to forty days when traditional naming ceremonies take place. Perinatal and neonatal deaths decline slower than infant mortality because they are affected by socio-economic development or child survival interventions.

Newborns usually do not have access to a health worker or facility in the first month of life and they often die at home. However, even when they do go to a health facility they either arrive too late or the medical staff is not prepared to provide quality services. Many studies have shown high case fatality rates (CFR) for newborns being treated for a variety of infections, which indicates poor quality of the services being offered. (See Table 1.14.)

II. CAUSAL FRAMEWORK: A PATHWAY FOR HEALTHY MOTHERS AND NEWBORNS

Many conceptual frameworks articulate various aspects of the interrelationships that contribute to maternal mortality, morbidity, and newborn deaths. UNICEF's framework identifies pregnancy as the "risk factor" for developing an obstetric complication. **Therefore, if a woman doesn't get pregnant she will not develop a complication.**

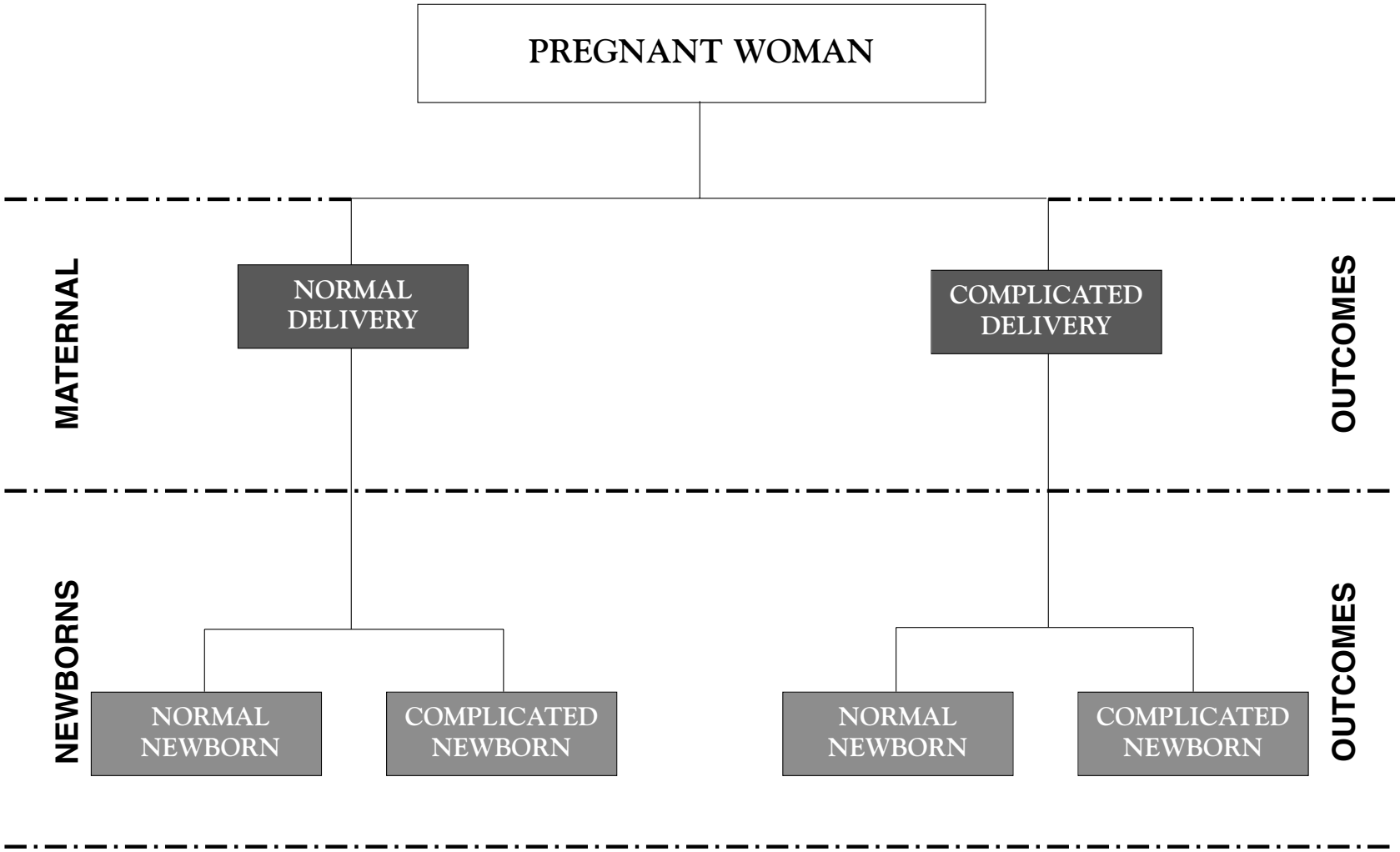
Other frameworks show that once a woman is pregnant and experiences a complication there are four main delays that contribute to and/or cause maternal mortality, and that can increase the severity of morbidity, including:

- ➔ ***Delay #1:*** ***Delays in problem recognition;***
- ➔ ***Delay #2:*** ***Delays in deciding to seek care;***
- ➔ ***Delay #3:*** ***Delays in reaching the health facility; and***
- ➔ ***Delay #4:*** ***Delays in receiving treatment at the health facility[14].***

These delays will vary by setting and they do not have to occur sequentially. In some settings only one delay will be a barrier while in others several interventions may need to be undertaken to address all of the delays. The delays provide a useful framework to initially assess the social and systemic factors that contribute to maternal and neonatal mortality in a particular setting.

Figure 1.3 outlines the types of maternal and newborn outcomes that can occur when a woman becomes pregnant. If the woman is pregnant she can either have a normal delivery or develop a complication. In either of those scenarios the newborn can be normal or suffer a complication **as presented in Figure 1.3. Maternal and newborn survival, as depicted in Figures 1.3 and 1.4, are intricately linked.**

FIGURE 1.3
MATERNAL AND NEWBORN OUTCOMES



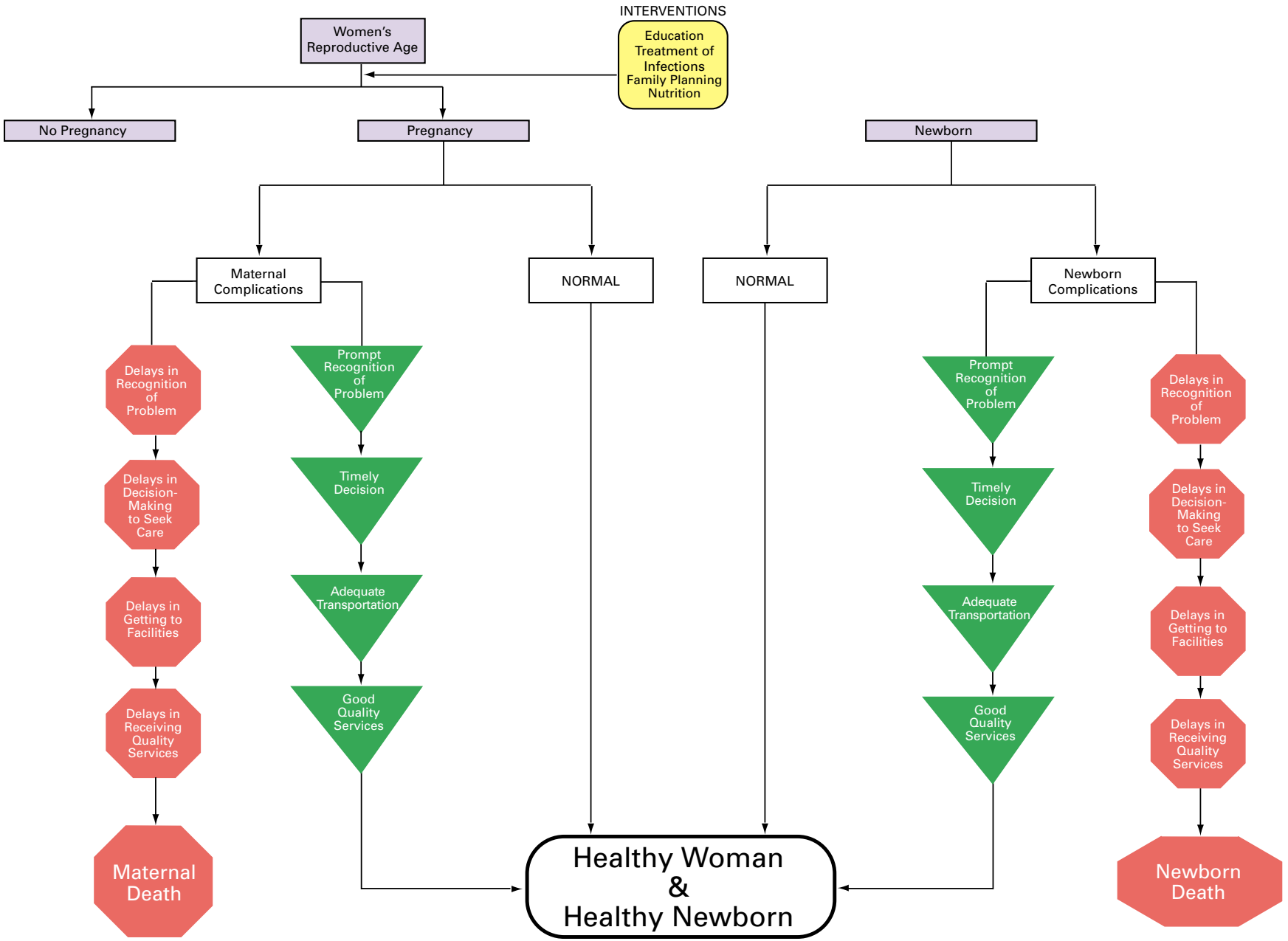
Experience has shown that there are several factors that can influence the type of outcomes that a woman and her newborn may experience. Figure 1.4 depicts several contributing factors that can affect these outcomes. For example, if a woman develops a complication and there are delays in recognizing the problem and/or receiving care, the woman is more likely to end up as a mortality. Conversely, if a timely decision is made to seek care and the woman is appropriately treated and managed, the greater her likelihood of survival. Similar barriers exist for ensuring that care is obtained and complications are appropriately managed in a timely manner for newborns. **Although Figure 1.4 is one-dimensional, as previously stated, we fully understand that maternal complications significantly affect newborn outcomes.**

Figure 1.4 depicts a "Pathway to Healthy Mothers and Newborns" which is a summary of several models that have been used to guide CARE's maternal and neonatal health programming. The pathway is based on the premises presented below.

1. If a woman does not get pregnant, she cannot develop an obstetric complication(s).
2. Interventions that delay the first birth (e.g., girls' education) or decrease the overall number of pregnancies (e.g., family planning) reduce the possibility of complications because the woman is not pregnant.
3. It is estimated that 15 percent of all pregnant women will develop life-threatening complications requiring some form of obstetric care.
4. Delays in problem recognition, decisions to seek care, getting to the health facility, and/or receiving quality, timely services all increase the risk of a maternal and/or newborn death.
5. Appropriate management of complications has a direct effect on the survival of both the mother and the newborn.
6. Good newborn care can significantly increase newborn survival.
7. Early detection, prompt referral and appropriate management of neonatal infections can significantly increase newborn survival.

The framework identifies pregnancy as the main factor for an obstetric complication, but there are several ways in which interventions can steer a woman and her newborn down the pathway to survival. It articulates two streams of actions that influence maternal and newborn outcomes. One pathway is more likely to result in a maternal and/or newborn death because there are delays in key actions to obtaining quality maternal and neonatal services. The other approach promotes essential behaviors that result in appropriate and timely management of maternal and neonatal complications, thus increasing women's and newborns' chances of survival.

FIGURE 1.4
PATHWAY TO HEALTHY MATERNAL AND NEWBORN CARE



III. WHY DO WOMEN AND NEWBORNS IN THE DEVELOPING WORLD EXPERIENCE A HIGHER RISK OF MORBIDITY AND MORTALITY?

Although it is estimated that 15 percent of all pregnant women will develop a pregnancy-related complication(s) and need obstetric services, the overwhelming majority of the deaths occur in the developing world[1]. **Why are women in the developing world more likely to endure chronic illnesses or die?** The lifetime risk of dying from a pregnancy-related complication accumulates over a woman's reproductive life and varies by region, as presented in Table 1.9. Sub-Saharan Africa has the highest lifetime risk, which is shown in Tables 1.9 and 1.10.

TABLE 1.9
WOMEN'S LIFETIME RISK BY REGION

REGION	LIFETIME RISK OF DYING
African	1 in 16
Asia	1 in 65
Latin America/Caribbean	1 in 130
All Developing Countries	1 in 48
All Developed Countries	1 in 1800

Source: WHO, 1997

There are 16 countries where women face a lifetime risk of 1 in 10 or less and another 19 countries with a lifetime risk of between 1 in 11 to 1 in 20 (See Table 1.10).

What is lifetime risk? Lifetime risk is a function of fertility and maternal mortality. Each time a woman becomes pregnant she risks dying from pregnancy-related complications. The risk is cumulative; the more times she becomes pregnant the greater her risk of dying. Maternal mortality is influenced by the social factors that inhibit access to care and/or the quality of the services. There is a direct relationship between the levels of maternal death and lifetime risk. The greater the numbers of maternal deaths; the higher the level of lifetime risk for a woman in that society. Even in areas that have relatively low MMR, the risks rise dramatically as fertility increases (See Table 1.11).

There are 16 countries where women face a lifetime risk of 1 in 10 or less. In another 19 countries women have a lifetime risk of between 1 in 11 to 1 in 20.

TABLE 1.10
HIGH LIFETIME RISK BY COUNTRY

LIFETIME RISK OF 1 IN 10 OR LESS		LIFETIME RISK OF 1 IN 11 TO 1 IN 20	
Afghanistan	(1 in 7)	Senegal	(1 in 11)
Guinea	(1 in 7)	Benin	(1 in 12)
Somalia	(1 in 7)	Nigeria	(1 in 13)
Sierra Leone	(1 in 7)	Gambia	(1 in 13)
Angola	(1 in 8)	Zaire	(1 in 14)
Yemen	(1 in 8)	Burkina Faso	(1 in 14)
Burundi	(1 in 9)	Cote D'Ivorie	(1 in 14)
Chad	(1 in 9)	Zambia	(1 in 14)
Ethiopia	(1 in 9)	Congo	(1 in 15)
Rwanda	(1 in 9)	Guinea-Bissau	(1 in 16)
Mozambique	(1 in 9)	Mauritania	(1 in 16)
Niger	(1 in 9)	Equatorial Guinea	(1 in 17)
Eritrea	(1 in 10)	Cambodia	(1 in 17)
Nepal	(1 in 10)	Haiti	(1 in 17)
Mali	(1 in 10)	Tanzania	(1 in 18)
Uganda	(1 in 10)	Laos	(1 in 19)
		Kenya	(1 in 20)
		Malawi	(1 in 20)
		Togo	(1 in 20)

Source: WHO, 1997

TABLE 1.11
LIFETIME RISK OF MATERNAL DEATH AT VARYING MATERNAL MORTALITY RATIOS AND PREGNANCIES PER WOMAN

	MMR = 500/100,000	MMR = 250/100,000
1 pregnancy	1 in 200	1 in 400
2 pregnancies	1 in 100	1 in 200
4 pregnancies	1 in 50	1 in 100
8 pregnancies	1 in 25	1 in 50

Source: Maine, 1991

Maternal deaths do not happen by chance. They result from a culmination of many interrelated factors to which women in the developing world are particularly vulnerable, including:

- ➔ low status of women;
- ➔ high fertility; and
- ➔ ill-equipped or inaccessible health services.

A. *Low Women's Status*

Women's status is an intersection between their productive (domestic and economic) and reproductive roles. In many cultures women are valued less than men. This may be manifested through female infanticide, limited access to food, lack of educational opportunities, restricted mobility, lack of participation in decision-making, expectation to bear many children, being subjected to female genital mutilation (FGM), prostitution and trafficking, heavy workloads, physical and emotional abuse, early marriage, and/or inadequate access to health services.

In many societies, a young woman is still trapped within a web of traditions that strongly promote early and frequent childbearing to gain respect within the society. The combination of these factors reinforces society's low value on women, resulting in delays in problem recognition, delays in decisions to seek care, unwillingness to spend money on women and delays in receiving care.

As a result, women in the developing world begin their pregnancies disadvantaged regarding their ability to:

1. secure adequate food for good nutrition;
2. reduce their heavy workloads;
3. access family planning services in order to choose the number and timing of their children; and
4. access health services during pregnancy and childbirth.

These factors all contribute to an increased risk of perinatal and neonatal mortality. Studies have shown that there is a dramatic rise in mortality when children are spaced closer than 24 months. Also, the combination of poor nutritional status and heavy workloads increases the likelihood of low birth weight (LBW) babies (See Chapter 2).

B. *High Fertility*

As stated previously, **every time a woman gets pregnant she runs the risk of developing a pregnancy-related complication which increases with each pregnancy. Thus, women in the developing world are at greater risk of maternal death.**

Although fertility rates have dropped, there are still 35 countries with total fertility rates (TFR) greater than 5[15, 16]. Sub-Saharan Africa has the highest lifetime risk because it has the highest fertility (See Tables 1.9 and 1.10). Worldwide, it is estimated that 15 million infants are born to adolescents every year, accounting for 10 percent of all births. Adolescents account for 21 percent of all maternal deaths[17].

Worldwide, 1 out of every 4 pregnancies is unwanted. Despite the fact that abortion is restricted or illegal in many countries, every day 50,000 women attempt or seek out abortions. Twenty million unsafe abortions are performed annually, resulting in between 80,000 to 100,000 female deaths each year [18].

Adolescents account for 21 percent of all maternal deaths.

C. *Quality of Obstetric Services*

The third factor determining the level of maternal mortality is access to quality maternal health services. The majority of births in the developing world occur at home. Of these, almost half are attended by an untrained caregiver. **This means that each year, about 60 million women give birth either alone, or assisted by a family member or an untrained attendant** [7] (See Chapter 3, Tables 3.3 and 3.4).

All pregnant women who develop complications (15%) need to have access to obstetric services. However, in most developing countries health facilities are not adequately equipped with skilled personnel, drugs, medical supplies, blood, anesthesia, and other inputs, such as electricity and water, to provide quality services on a 24 hour basis. The lack of skilled personnel places the newborn at particular risk. Mismanagement of normal as well as complicated deliveries is a major cause of birth asphyxia and trauma that can lead to death.

An African woman died in the hospital while giving birth to her fifth child. She had not gone too late to the hospital, but...

By the time, they struggled to get her admission card,
she was admitted and her file was found,
the midwife was called, finished eating and came,
the husband went to buy gloves and returned,
the midwife came and examined the woman,
the bleeding started.

By the time, the doctor was called and found,
the doctor arrived,
the husband went out to search for blood bags and other supplies,
the husband found the materials and pleaded with the drug seller to reduce the price,
the lab technician came and took the blood from the tired husband,
the woman continued to bleed.

By the time, the day and night nurses changed shifts;
the midwife and doctor were found and came again;
the admission forms were completed;
the husband signed the consent form for the transfusion,

the woman was dead.

Source: Feuerstein, 1996; Maine, 1989

IV. MEDICAL CAUSES OF MATERNAL MORTALITY AND MORBIDITY

A. Direct Causes

Direct causes refer to complications or diseases that occur only during pregnancy. Direct obstetrical causes, including post-partum hemorrhage, unsafe abortion, sepsis, pregnancy-induced hypertension (PIH) disorders, and obstructed labor, account for 75 to 85 percent of all maternal deaths.

1. **Hemorrhage:** Antenatal hemorrhage occurs between the 28th and 40th week of gestation and is usually due to premature separation of the placenta and/or abnormal placental position (placenta previa). Maternal death usually occurs within the first 12 hours. Intrapartum bleeding is usually due to uterine rupture during obstructed or prolonged labor[8].

   Post-partum hemorrhage (PPH) is the most prevalent type of hemorrhage and often begins immediately (30 minutes – 2 hours) after birth. It is primarily due to the failure of the uterus to contract and/or retention of the placenta for more than 30 minutes after delivery. Less severe bleeding can be caused by lacerations. Women who have had many pregnancies (multipara women) often have a higher risk of hemorrhage because their uteri have been over stretched but any woman can develop PPH. More than half of the PPH deaths occur in South and Southeast Asia[8].

EFFECTS OF HEMORRHAGE	
WOMAN	**INFANT**
Shock	Asphyxia
Cardiac Failure	Stillbirth
Severe Anemia	

Source: WHO, 1994

2. **Unsafe Abortion: According to UN figures, 20 million unsafe abortions are performed annually, resulting in 80,000 to 100,000 female deaths each year[1].** Table 1.12 presents abortion rates by region with Africa being the highest followed by Asia.

Abortion is illegal in many countries, but even where it is legal women do not have access to quality services. Potentially life-threatening risks do not deter women from seeking or using self-inducing methods to terminate a pregnancy. Many women are only successful in terminating their pregnancies after several attempts. It is estimated that 5 million teenagers worldwide have abortions each year and about half of these are unsafe [18].

TABLE 1.12
ABORTIONS BY REGION

	LAC	ASIA	AFRICA
UNSAFE ABORTIONS (MILLIONS)	**4.6**	**9.2**	**3.7**
ANNUAL DEATHS FROM ABORTIONS			
% OF MATERNAL DEATHS	25	12	13
NUMBERS	6,000	40,000	23,000
RISK OF DEATH FROM UNSAFE ABORTIONS	1 in 800	1 in 250	1 in 150

Source: Population Report, 1997; AGI, 1996

It is estimated that 5 million teenagers worldwide have abortions each year and about half of these are unsafe.

The two most common causes of death from unsafe abortions are hemorrhage and sepsis. Morbidities resulting from abortion complications can be severely debilitating. Complications of abortion consume enormous health resources. In Africa, women with abortion complications occupy between 46 and 64 percent of hospital gynecology beds[19] (See Chapter 3).

EFFECTS OF UNSAFE ABORTION ON WOMEN
Hemorrhage
Shock/Sepsis
Reproductive Tract Infections
Infertility

Source: WHO, 1994

3. **Pregnancy Induced Hypertension (PIH):** Pregnancy induced hypertensive disorders such as pre-eclampsia/eclampsia are not well understood. The onset of symptoms – rise in blood pressure, swelling in the hands and face, protein in the urine, overly sensitive reflexes – usually appear suddenly. If pre-eclampsia is not treated, it can rapidly escalate to eclampsia with convulsions that may cause brain or kidney damage and/or death of both the mother and the fetus. Some women do not exhibit the usual pre-eclampsia symptoms and develop eclampsia directly. This condition is most often seen in first pregnancies, but it can happen during any pregnancy[4, 20, 21].

EFFECTS OF PREGNANCY INDUCED HYPERTENSION	
WOMAN	**INFANT**
Shock	Asphyxia
Cardiac Failure	Stillbirth
Brain Damage	
Kidney/Liver Damage	

Source: WHO, 1994

4. **Obstructed Labor:** Obstructed labor is often initially diagnosed as "prolonged labor" but is usually caused by malpresentations of the fetus or disproportion between the head of the baby and the woman's pelvis Cephalopelvic Disproportion (CPD). If a Cesarean Section (C-section) is not performed, the woman will die from hemorrhage, infection, or sheer exhaustion, and the fetus will die from lack of oxygen. Although any woman can develop this complication, very young, physically immature women, those of small stature, those who are stunted from chronic malnutrition, and those who have had previous pregnancy-related complications are thought to be at greatest risk[20]. However, if a woman of small stature has delivered without difficulty in a previous pregnancy, she should not be considered high risk[4, 20].

EFFECTS OF OBSTRUCTED LABOR	
WOMAN	**INFANT**
Vaginal Fistula	Asphyxia
Uterine Rupture/ Hemorrhage	Stillbirth
Uterine Prolapse	Sepsis
Sepsis	Birth Trauma

Source: WHO, 1994

5. **Sepsis:** Women who experience ruptured membranes or prolonged labor for more than 24 hours are susceptible to infection. Sepsis usually occurs within 2 to 4 days after delivery. The main causes of infection/sepsis are unhygienic practices during the birthing process, such as:

   - unclean delivery environment;
   - multiple vaginal examinations;
   - artificial rupture of membranes in early labor;
   - insufficient hand washing by health workers during the birthing process;
   - introduction of foreign objects into the vagina during the birthing process (e.g. leaves, oil, earth);
   - use of unclean instruments, including hands, during the birthing process and cutting the cord; and
   - use of dirty rags and cloths as sanitary pads during the post-partum period[4, 20].

EFFECTS OF SEPSIS	
WOMAN	**INFANT**
Shock	Sepsis
Premature Labor	Premature Birth
PID	Eye Infections
Infertility	Blindness

Source: WHO, 1994

B. Indirect Causes

Indirect causes of maternal mortality include diseases, such as anemia or malaria, that may already exist but are exacerbated by pregnancy. They are thought to cause 15-20 percent of maternal deaths. A woman can have several conditions existing simultaneously, which increases her overall risk of morbidity and mortality.

Maternal anemia (hemoglobin levels below 11g/dl) affects about 500 million women of reproductive age (half of the WRA) worldwide.

1. **Anemia:** Maternal anemia (Hb below 11g/dl) affects about 500 million women of reproductive age (half of the WRA) worldwide. Anemic women are more prone to disease and infection and do not tolerate even small amounts of blood loss well. There are several causes of anemia including iron and folate deficiencies, malaria, intestinal parasites, and deficiencies of Vitamins A and C. The fetus is able to secure adequate iron stores at the expense of the mother's reserves, increasing the severity of the mother's anemia. These factors increase an anemic woman's risk of morbidity and mortality[23,24,25] (See Chapters 2, 3 and 5).

EFFECTS OF ANEMIA	
WOMAN	**INFANT**
Shock	Asphyxia
Cardiac Failure	Stillbirth
	Low Birth Weight

Source: WHO, 1994

2. **Malaria:** Malaria weakens nutritional status and destroys red blood cells, resulting in severe anemia. Resistance to malaria among pregnant women, first developed during childhood, begins to break down around the 14th week of gestation. This seems to be the most pronounced in the first pregnancy, and to a lesser degree, the second pregnancies. These women are also more susceptible to plasmodium faliciparum malaria. About 22 million pregnant women live in malaria endemic areas of Africa. Malaria is believed to contribute to 5-10 percent of infant deaths associated with LBW[4] (See Chapter 3 and Chapter 5).

About 22 million pregnant women live in malaria endemic areas of Africa. Malaria is believed to contribute to 5-10 percent of infant deaths associated with LBW.

EFFECTS OF MALARIA	
WOMAN	**INFANT**
Severe Anemia	Premature Birth
Stroke	Miscarriage
	Low Birth Weight

Source: WHO, 1994

3. **Hookworm:** Hookworms are parasites that attach to the lining of the small intestines and ingest blood, resulting in the loss of red blood cells leading to anemia. Measures to prevent hookworm include improved sanitation and wearing shoes[4] (See Chapter 3 and Chapter 5).

EFFECTS OF HOOKWORM ON WOMEN
Severe Anemia
Anorexia/Decreased Food Intake
Fatigue

Source: WHO, 1994

V. CAUSES OF NEWBORN DEATHS

Every year almost 8 million fetuses/newborns die late in pregnancy, at birth or soon after, as the result of poor maternal care and/or inadequate management of pregnancy-related complications.

TABLE 1.13
MATERNAL COMPLICATIONS AND PERINATAL OUTCOMES

PROBLEM	MOST SERIOUS EFFECTS ON FETUS/NEWBORN
Severe Anemia	LBW, asphyxia, stillbirth
Hemorrhage	Asphyxia, stillbirth
Hypertensive disorders of pregnancy	LBW, asphyxia, stillbirth
Puerperal Sepsis	Neonatal sepsis
Obstructed Labor	Asphyxia, stillbirth, sepsis, birth trauma
Infection during Pregnancy (SITs, HIV)	Premature delivery, neonatal eye infection, blindness, pneumonia, stillbirth, congenital syphilis, vertical transmission of HIV/AIDS
Hepatitis	Hepatitis
Malaria	LBW, prematurity, intrauterine growth retardation
Unwanted pregnancy	Increased risk of morbidity from abuse, neglect
Unclean delivery	Neonatal tetanus, sepsis

Source: UNICEF, 1998

WHO estimates that 85 percent of newborn deaths are due to infections, birth asphyxia, and birth injuries, presented in Table 1.14[8]. Maternal infections during pregnancy, such as malaria and sexually transmitted infections (STIs), especially syphilis and HIV, have a negative effect on neonatal outcomes[4, 7, 9, 10, 20].

TABLE 1.14
CAUSES OF NEONATAL DEATHS

CAUSE OF DEATH	NUMBER OF DEATHS	PERCENTAGE
Birth Asphyxia	840,000	21
Birth Traumas	420,000	11
Neonatal Tetanus	560,000	14
Sepsis	290,000	7
Pneumonia	755,000	19
Diarrhea	60,000	2
Prematurity	410,000	10
Congenital Anomalies	440,000	11
Other	205,000	5

Source: WHO, 1995

Most neonatal deaths, and at least half of the stillbirths, are due to problems during pregnancy, delivery and the postpartum period. **More than two-thirds of newborn deaths are among fully-developed babies born at term and apparently well-equipped for life.** These children would have been healthy if appropriate care had been taken. Helping these children grow up healthy does not require expensive technology; rather, it calls for a set of simple preventive measures and prompt newborn care[4, 7, 9, 10, 20].

A. Low Birth Weight

One of the major contributing factors to perinatal and neonatal mortality is low birth weight (LBW) – weighing less than 2,500 grams. Every year 22 million LBW babies are born who fall into two categories: those that are premature (born before 37 weeks) or those with intrauterine growth retardation (IUGR) – babies who are full-term but small for gestation age (SGA). Most LBW babies in developing countries are due to IUGR which results from women with poor nutritional status, anemia, malaria, and sexually transmitted infections (STIs) either before conception or during pregnancy[26].

Birth weight is crucial to the survival of the infant. Studies have shown that normal infants in the developed world have a mortality rate of 2/1,000 live births while LBW babies have a mortality rate of 86/1,000 live births. If LBW babies survive they have greater rates of illness, which may result in death and delayed neurological development (e.g., poor vision, decreased educational attainment)[12].

B. Infections

Every year, 30 million newborns will acquire a neonatal infection and one to two million will die as a result of these infections. These infections include; sepsis, pneumonia, and tetanus. There are also about 500,000 cases of neonatal tetanus, primarily in 12 countries[12].

Every year there are an estimated 333 million new cases of sexually transmitted infections (STIs) worldwide[27]. The consequences of STIs on the fetus/newborn can be devastating, causing blindness, LBW, spontaneous abortions and congenital abnormalities. The effects of maternal syphilis are particularly harsh on newborns, resulting in large numbers of premature births and stillbirths[28] (See Chapter 3).

Worldwide, approximately 500,000 infants are perinatally infected with HIV[27]. Research indicates that HIV positive women can transmit the virus to their fetus/newborn – known as vertical transmission or Mother-to-Child Transmission (MTCT) – through three mechanisms. First, the mother can infect the fetus during pregnancy since the virus can pass across the placenta. Second, the virus can be transmitted during delivery. This is the most likely means of transmission because the woman has a "high viral load" and there is a greater opportunity of exposure to the mother's blood from trauma during childbirth. Third, HIV can be transmitted through breastmilk to the infant[27].

As previously stated, malaria is believed to contribute to 5-10 percent of infant deaths associated with low birth weight (LBW) in Africa. These babies have a death rate that is 5 to 30 times higher than that of normal weight babies[20].

Other reproductive tract infections, such as urinary tract infections during pregnancy, also increase a woman's risk of developing puerperal sepsis. If the woman develops sepsis, the newborn should be closely monitored and treated if necessary[12].

C. *Hypothermia*

Newborns have a relatively large surface area, poor thermal insulation, and a small body mass to produce and conserve heat, so they are vulnerable to heat loss. Infants are most sensitive to hypothermia in the first 12 hours after birth, although this condition can occur at any time. Hypothermia can occur quickly if the infant is left wet or exposed, especially while waiting for the placenta to be delivered[9].

VI. CONCLUSION

This Chapter attempts to articulate a variety of factors that contribute to the high rates of maternal and neonatal mortality and morbidity in the developing world. The complexity of this problem forces us to re-think our approach, challenging the status quo, and highlights the need to better understand the beliefs, practices and values of the women and families that are not able to access maternal health services. Table 1.15 presents a summary of the factors affecting maternal health. Table 1.16 provides a synthesis of the factors that effect perinatal and neonatal mortality.

TABLE 1.15
REASONS FOR MATERNAL MORTALITY/MORBIDITY

Combination of socio-cultural factors such as:

- ➔ Harmful Practices (e.g. FGM);
- ➔ Poor Nutrition and Associated Factors;
- ➔ Low Women's Status/Empowerment/Decision-Making;
- ➔ Frequent Pregnancies/High Fertility Rates/ Short Birth Intervals;
- ➔ Early Marriage and Adolescent Pregnancies;
- ➔ Heavy Workload;
- ➔ Reliance on Traditional Medicine and Healers;
- ➔ Desire for Small Babies; and
- ➔ Emotional Abuse/Violence.

Unmet need for family planning services due to:

- ➔ Traditional Beliefs/Practices;
- ➔ Lack of Knowledge; and
- ➔ Inaccessible or Poor Quality Services.

Delay in problem recognition due to:

- ➔ Traditional Beliefs;
- ➔ Low Perceived Risk;
- ➔ Low Knowledge of Causes of Death, Danger Signs, and Complications; and
- ➔ Inadequate Screening Programs.

Delay in deciding to seek care due to:

- ➔ Low Women's Status/Participation in Decision-Making;
- ➔ Lack of Birth Planning/Preparedness;
- ➔ High Rates of Unattended Home Births and Untrained Attendants; and
- ➔ Poor Quality (Perceived or Actual) of Health Services.

Delay in reaching the health facility due to:

- ➔ Geographic Distance;
- ➔ Lack of Resources to Pay for Services;
- ➔ Inadequate Communication/Transportation Systems; and
- ➔ Inadequate Knowledge of where to seek care and how to get to a facility.

Delay in receiving quality treatment at the health facility due to:

- ➔ Lack of Medicine, Supplies, Blood, and Equipment to Treat Complications;
- ➔ Cumbersome Administrative Processes;
- ➔ Lack of Competent, Motivated Personnel;
- ➔ Lack of Adequate Supervision and Management Information Systems; and
- ➔ Lack of Outreach and Follow-up Mechanisms.

TABLE 1.16
REASONS FOR NEWBORN DEATHS

Combination of socio-cultural factors such as:

- ➔ Frequent Pregnancies/High Fertility Rates/Short Birth Intervals;
- ➔ Young Pregnancies;
- ➔ Desire for Small Babies; and
- ➔ Gender Discrimination Beginning in Infancy.

Delay in problem recognition due to:

- ➔ Traditional Beliefs;
- ➔ Low Knowledge of Danger Signs;
- ➔ Maternal Death; and
- ➔ High Rates of Unattended Home Births with/without untrained attendants.

Delay in deciding to seek care due to:

- ➔ Traditional Beliefs; and
- ➔ Low Knowledge of Medical Conditions/Consequences.

Delay in reaching the health facility due to:

- ➔ Lack of Resources to Pay for Services;
- ➔ Inadequate Communication and Transportation Systems; and
- ➔ Low Knowledge of where to seek care and how to get there.

Delay in receiving quality treatment at the health facility due to:

- ➔ Lack of Trained Personnel to Deal with LBW and Neonatal Infections;
- ➔ Lack of Supervision and Information Systems;
- ➔ Lack of Outreach and Follow-up Systems; and
- ➔ Lack of Medicines and Supplies to Properly Treat Complications.

2

PREPREGNANCY FACTORS

I. LOW WOMEN'S STATUS

Many factors affect girls and women before they become pregnant, including the rubric conditions described as low women's status encompassing socio-cultural conditions, traditional beliefs and practices, (i.e., selective abortion and female infanticide), poor nutrition, high fertility, and abuse and/or violence.

"It is the unfortunate man who loses his cows; the fortunate one loses his wife."
(Bengali proverb)

As the Bengali proverb indicates, despite women's important role in managing the household and contributing income, many cultures value women less than men. This may be manifested through less access to food, limited educational opportunities and access to health services, restricted mobility, lack of participation in decision-making, expectation of large families and son preference, prostitution and trafficking, female genital mutilation, heavy workloads, physical and emotional abuse, and early marriages. (Note: These values and practices vary by context and culture.)

Many of these practices begin at birth and continue throughout a woman's life. Girls often have less access to food than their brothers. Research in Bangladesh found that five-year-old boys were given 16 percent more food than girls of the same age[6]. A study in India found that boys were more likely than girls to be given fatty foods and dairy products. As a result, girls were four times as likely to suffer from malnutrition than boys. The study also found that girls were forty times less likely than boys to be taken to the hospital[6]. (Note: These practices are most common in South Asia and to a lesser extent in parts of Africa.)

Women's status remains low because they are denied or have limited educational opportunities. ***Of the 130 million children who are not attending primary school in the developing world, 60 percent are girls.*** Although more girls are entering primary school than before, the dropout rates for girls remain high in many countries[17]. ***Of the estimated 960 million people who are illiterate, 66 percent are women.*** This significantly restricts their earning potential and involvement in decision-making about family resources.

Source: Feuerstein, 1993

In addition, there is well-documented evidence showing a positive correlation between women's higher education and lower infant mortality. This association is also shown between higher levels of female education and lower rates of maternal morbidity and mortality rates, as well as increased family planning use.

Religion, culture, superstitions, past experiences, and education all influence perceptions. These factors strongly color people's beliefs, understanding and acceptance of traditional and Western medical practices. In many parts of the world, health – physical, emotional, and spiritual – is considered to be a state of balance. This attitude affects and often dictates normal interactions and use of medical treatments[29].

FIGURE 2.1: LOW WOMEN'S STATUS
Some connections between women's status and maternal-mortality

Society/Culture/Community

- Fertile woman provides male with status.
- Offspring provide family work force.
- Woman's status may be lower than livestock.
- Infertile woman may be divorced.
- Women usually has little voting/political power.

Economic

- Cannot afford to hire transport in obstetric emergency.
- Cannot purchase blood for transfusion or antibiotics for infection.

Labor

- Heavy physical labor throughout reproductive age and pregnancy.
- Illness ignored until too sick to work, (e.g., bad headaches).

Education

- Girls less likely to go to school.
- Leave school early to help family.
- Hard to attend literacy/adult education classes due to status/workload.

Mobility

- Cannot travel without permission of husband/family.
- Cannot afford fares.

Family/Marriage

- Early marriage leads to teenage pregnancy.
- Attendance for antenatal care may depend on mother-in-law.
- Only husband can permit journey.
- Low status means depending on others to get health care.

Fertility

- High fertility increases status – and risk of death.
- Pregnancies are too soon, too many, too often/close and too late.
- FP decisions made mostly by men.
- Lack of FP services increases unwanted pregnancies and abortion.

Health

- Girl children receive less health care than boy children.
- Late or no antenatal care prevents early detection of complications.

Nutrition

- Girl children receive less food than boy children.
- Poor nutrition can result in pelvic contraction and obstructed labor.
- Anemia may cause hemorrhage.
- Depletion of body reserves from frequent pregnancies and lactation.

Source: Feuerstein, 1993

A. Early Marriage

In many countries, girls are married shortly after or even before menarche to ensure that babies are not born out of wedlock, bringing shame to their families.

> **"Society will condemn us if our daughters are not married by the age of 15," say women in an Indian village. Thousands of miles away, mothers in Burkina Faso agree. "She has to be married as soon as possible, otherwise she will give birth to an illegitimate baby." (UNFPA 1992)**

Early marriage limits educational and economic opportunities and often leads to early pregnancy. A 1995 review of selected countries by the Alan Guttmacher Institute (AGI) found that 50-75 percent of all first births among married women occurred within the first two years of marriage[18].

B. Female Genital Mutilation

In several cultures, female genital mutilation (FGM) is an accepted practice. **An estimated 130 million women and girls have undergone some form of FGM and at least two million girls are at risk of mutilation each year, mostly in 28 African countries. Egypt, Ethiopia, Kenya, Nigeria, Somalia, and Sudan account for 75 percent of all the FGM cases.** The age at which FGM is carried out varies, but is most common between 4 to 10 years of age. The procedure is usually performed by untrained older women in the community, with various instruments (scissors, knives, razors) and often treated with herbal pastes[30]. Female genital mutilation encompasses a range of procedures (See Table 2.1).

TABLE 2.1
WHO CLASSIFICATION FOR FGM

TYPE I	Excision of the prepuce with or without excision of part or all of the clitoris.
TYPE II	Excision of the prepuce and clitoris together with partial or total excision of the labia minora.
TYPE III	Excision of a part or all of the external genitalia and stitching/narrowing of the vaginal opening (infibulation).
TYPE IV	Unclassified, including: ■ pricking, piercing, or incision of the clitoris and/or labia prepuce; ■ stretching the clitoris or the labia; ■ cauterization by burning the clitoris and surrounding tissues; ■ scraping (cutting) of the vagina; and/or ■ introduction of corrosive substances into the vagina to cause bleeding or herbs to tighten the vaginal passage.

Source: WHO, 1995

Most (80%) women experiencing FGM undergo excision of the clitoris or the clitoris and labia. Infibulation, the most extreme form, involves the complete removal of the clitoris, labia minora, inner surface of the labia majora, and then the two sides of the vulva are stitched together, mostly in Somalia, Djibouti, Sudan, and Ethiopia[30]. The damage done to the female genitalia and their functions is extensive and irreversible. Since an infibulated woman is stitched, sexual intercourse is very painful. At childbirth the woman has to be cut to allow passage of the baby and then she is re-sutured after giving birth.

Women who have undergone FGM suffer serious complications, such as urinary tract and pelvic infections, difficulty with urination and menstruation, tetanus, fistulas, sepsis, infertility, and prolonged labor leading to the death of the mother and often the newborn as well. While there may be significant maternal mortality and morbidity associated with FGM, there have not been any studies to conclusively demonstrate the associations.

II. LOW SOCIO-ECONOMIC STATUS/ POVERTY AMONG WOMEN

Women are responsible for up to 75 percent of food production in the developing world. They constitute one-third of the world's wage labor force and one-fourth of the industrial labor force[6]. Yet, poverty is becoming increasingly feminized as a result of worldwide economic crises, civil conflicts, environmental degradation and changes in traditional values. This is reflected in male migration, desertion, erosion of the extended family systems, and single motherhood. It is estimated that 20 to 30 percent of households in the developing world are female-headed. In India, female-headed households (FHH) comprise 30 percent of the families below the poverty line[6]. These households are not poor because they work less, but rather these women work harder to fulfill both their domestic and economic roles. They own less land, fewer animals and other assets, and they have less education and access to credit. One study in Latin America found that women often choose to work fewer hours in order to attend to child care and other domestic chores[28]. Unfortunately women's domestic responsibilities are often undervalued. It is estimated that if domestic work was "valued" in economic terms, the gross domestic product (GDP) of many countries would need to be increased by 25 percent.[6]

Women constitute one-third of the world's wage labor force and one-fourth of the industrial work force, yet, poverty is becoming increasingly feminized.

Although female-headed households (FHHs) are associated with poverty, children from these households often fare better than those in male-headed households (MHH). In Brazil, child survival rates were 20 percent higher in female-headed households (FHHs) than in male-headed households (MHHs), while in Chile and Kenya, children in FHHs showed less stunting than those in MHHs. It seems that poor women may use their resources more wisely than poor men to invest in their children's well being, but not necessarily their own health and welfare [31, 32].

Frequent pregnancies and poor health not only drain a woman's productive energy but also contribute to her poverty. An Indian study found that maternal morbidities, as measured by the Disability Adjusted Life Years (DALYs); reduced the female labor force by 22 percent, and illness was found to be the second highest cause of indebtedness[6]. Reducing fertility and improving women's health can improve individual productivity and family well-being, particularly when combined with education and access to jobs. Improving women's health and nutritional status can also accelerate a nation's economic development.

III. NUTRITION

Healthy pregnancies and lactation require a diet with adequate caloric intake as well as a diversity of foods to ensure appropriate nutritional intake. If a pregnant woman is overworked and underfed, she is more likely to have a low birth weight (LBW) baby who is more susceptible to disease and death. In addition, the repetitive cycle of childbearing in the developing world takes a great toll on women. It is estimated that women in developing countries spend 60 percent of their lives being either pregnant or breastfeeding[6].

The World Bank defines food security as access by all people at all times to sufficient food for an active, healthy life. ***In Africa, 40 percent of the population is food insecure, followed by 25 percent in both South Asia and Latin America[6].*** Food insecurity results in loss of fat stores, micronutrient deficiencies, chronic malnutrition, and decreased work capacity[23]. CARE's household livelihood security (HHLS) framework expands the World Bank definition to incorporate the concepts of adaptability/resilience. To be truly secure, households must be able to access food and adjust to threats to their livelihood, such as sickness and drought. There are four key factors that affect food security and place women, particularly pregnant women, at greater risk of inadequate nutrition.

- **Limited economic opportunities:** To secure an adequate diet, a household must be able to grow or produce its own food or have access to resources to buy food in the market.

- **Seasonal fluctuations in food availability:** A variety of foods must be available in the market throughout the year for an adequate diet. For example, if green leafy vegetables are only grown during certain seasons, pregnant women may not get critical nutrients when they need them. The cost of food also increases during certain seasons, influencing their availability.

- **Distribution of food within the household:** In many cultures women eat least, and last, despite their heavy workloads.

- **Cultural beliefs and customs:** There are many dietary taboos around pregnancy and lactation. Some foods that are high in protein are only eaten at festivals, or women are not permitted to eat them during pregnancy. In many societies, pregnant women are advised to eat less in order to keep the baby small and ensure an easier delivery.

Malnutrition of women and girls is closely linked with low women's status and societal norms. These practices have their roots in behaviors started during infancy and continued throughout the woman's life. **An estimated 450 million adult women in the developing world are stunted** (short for their age) resulting from chronic protein-energy malnutrition (PEM) throughout their lives. The highest levels of malnutrition among women of reproductive age are found in South Asia, where 60 percent are underweight, 60 percent are anemic and 15 percent are stunted[5].

As stated previously, **the combination of low prepregnancy weight and pregnancy weight gain has detrimental effects on infant outcomes,** but this relationship is less clear in terms of maternal outcomes. Women with low prepregnancy weights need larger pregnancy weight gains to effectively lower their risk of an unfavorable outcome. However, these weight gains (up to 18kgs) may be unrealistic for women in the developing world to attain.

Equal emphasis should be placed on improving prepregnancy weights so that women do not enter pregnancy in a nutritionally disadvantaged state[31].

Micronutrient deficiencies: Micronutrient deficiencies are directly related to poor diet quality and quantity. The most common deficiencies are iron, folic acid, Vitamin A, and iodine.

Iron deficiency diminishes the ability to fight infection and causes anemia. Maternal anemia affects about 500 million women of reproductive age (WRA) worldwide. Anemia often has several causes, but the main causes are inadequate diet, low absorption of iron, or iron loss. Other nutrient deficiencies of folic acid and Vitamins A and C also contribute to anemia. If these nutrients are available in adequate amounts, they enhance iron absorption. Diseases such as malaria and hookworm also significantly contribute to anemia. Supplementation of adolescent girls' diets before they are pregnant can greatly increase their iron stores (See Chapter 5, Table 5.8).

Vitamin A is needed for a strong immune system and prevention of night blindness. Several studies in South Asia have found that women who have night blindness consume a poor diet in general and suffer from protein energy malnutrition (PEM), are more likely to be anemic, and are more susceptible to infections. This once again stresses the importance of working with women to get adequate Vitamin A sources in their diets before they get pregnant (See Chapter 5, Table 5.8).

Iodine is needed for adequate physical and mental development of the fetus. Children born to iodine deficient mothers have an increase in mental retardation and a loss of IQ even in mild cases (See Chapter 5, Table 5.8).

Emphasis should be placed on improving prepregnancy weights so that women do not enter pregnancy in a nutritionally disadvantaged state.

IV. HIGH FERTILITY/UNINTENDED PREGNANCY

Higher fertility inherently provides more opportunities for obstetrical complications to arise. Women in the developing world suffer higher lifetime risks. Although fertility rates have dropped significantly over the past few decades, in many countries they remain high. Sub-Saharan Africa has the highest fertility rates (TFRs), ranging from 4.8 to 7.3, followed by Asia with 3.7 to 5.1 and Latin America with 3.1 to 4.6[16]. Large families have traditionally been considered desirable because they provide labor for family agriculture and a social security net for parents in their old age due to lack of retirement pensions.

A. Adolescent Pregnancies

Fertility is kept high by early marriages and lack of access to FP. If a woman can delay pregnancy until she is physically mature, or if she can space her pregnancies at least two years or more apart, then she is less likely to have a complication.

It is estimated that over 120 million women worldwide would like either to space their children at least 2 years apart or limit their family size, but they are unable to do so.

Girls become fertile years before their bodies are ready to cope with pregnancy and childbirth. At menarche girls have approximately four percent more height and 12 to 18 percent of their pelvic growth ahead of them[20]. **Adolescent pregnancy threatens the health and nutritional status of the mother and fetus, with both competing to meet their own growth needs.** In addition, babies born to teenagers suffer higher rates of premature birth, stillbirth and LBW. A Nigerian study found that the MMR of girls below the age of 15 was seven times greater than that of 20- to 24-year-olds[20].

Worldwide, it is estimated that 15 million infants are born to adolescents every year, accounting for 10 percent of all births. Adolescents account for 21 percent of all maternal deaths[17].

B. Inadequate Family Planning Services

It is estimated that over 120 million women worldwide would like either to space their children at least 2 years apart or limit their family size, but they are unable to do so. These women express a desire to use FP, yet they are not using a method, indicating an unmet need. India has the most women, 31 million, with an unmet need for FP services, followed by Pakistan with 5.7 million, Vietnam with 5.2 million, Indonesia and Bangladesh with 4.4 million each, Nigeria with 3.9 million, Mexico with 3.1 million, Brazil with 3 million, Philippines with 2.5 million and Egypt with 1.8 million[33].

The reasons for not using FP vary by context but may include:

- ➔ difficulty accessing quality family planning services;
- ➔ concerns about side effects from FP methods;
- ➔ misinformation or lack of information;
- ➔ opposition from the husband, family or community; and
- ➔ insufficient understanding of the risks associated with pregnancy.

It is estimated that about one third of maternal deaths, or 175,000 annually, might be avoided by improving access to family planning services[1, 3].

C. *Increased Parity and Age*

Many studies show that the second and third pregnancies are the most trouble-free, while complications and maternal deaths significantly increase after the third child. In Jamaica, a woman giving birth to her fifth or higher order child was 43 percent more likely to die than a woman giving birth to her second child[34].

The risk also rises with increasing age. Women over 35 years old make up a sizable portion of all women giving birth. For example, in Bangladesh these women constitute 25 percent of all pregnancies, in Nigeria 15 percent, and in the United States 21 percent[20]. In developing countries, women age 35 and older are more likely to develop complications largely due to the fact that they have had more pregnancies and many have not adequately spaced their pregnancies.

A Honduran study found that women with birth intervals of less than a year were twice as likely to die, compared to women with longer intervals[35]. Mortality is also much higher among infants/children with birth intervals less than two years. Several demographic and health surveys show that if the birth interval can be increased to 36 or 48 months there are significantly added benefits to the mother (e.g., lower anemia) as well as to the infant/child.

V. ABUSE AND VIOLENCE AGAINST WOMEN

Gender-based violence that crosses ethnic, cultural and economic lines is closely linked to low women's status, and affects millions of women worldwide. In many countries, violent acts against women are ignored, tolerated or even sanctioned by law or custom.

The United Nations (UN) Declaration on the Elimination of Violence Against Women defined violence against women as "any gender-based violence that results in, or is likely to result in, physical, sexual or mental harm or suffering to women". It includes:

- ➔ female feticide and infanticide;
- ➔ female genital mutilation;
- ➔ physical violence, including wife battering, burning, and acid throwing;
- ➔ emotional abuse, such as paying attention to other women, using abusive language, restricting movement, snatching away belongings, scolding, coercion, or refusal to talk; and
- ➔ sexual abuse, including rape by family members[36].

Studies reveal that 20 to 50 percent of women worldwide are beaten some time in their lives by their male partners. These studies also show that 50 to 60 percent of women who are abused by their partners are also raped[36]. It is estimated that 13.5 million refugees are women who live in conditions that make them vulnerable to violence and abuse.

The main reasons for domestic violence, which vary by context, may include: suspected infidelity, failure to obey commands, marital disputes and economic problems. **Persons known to the women – fathers, husbands, male family members and friends – commit most violent acts.** It is common for violence to begin at a young age and continue throughout a woman's life[37]. Abuse and the fear it engenders affect women's lives in many ways, including self-injury, depression, mental anguish, anxiety, post traumatic stress syndrome, homicide, and suicide[37].

UNICEF estimates that there should be 60 million more women in the world today, but they have been killed or have died through violence directed at their gender.

(UNICEF 1996)

The reproductive consequences of violence are:

- ➔ sexual abuse/rape beginning at a young age;
- ➔ injuries to the genital tract;
- ➔ high rates of unwanted pregnancies, often resulting in abortion;
- ➔ sexually transmitted infections, including HIV/AIDS;
- ➔ battering during pregnancy, which leads to low birth weight babies, premature births, and miscarriages[37].

VI. CONCLUSION

Interventions that can avert or delay pregnancy until a time when a girl or woman would be less likely to suffer an injury or death (e.g., education, FP) are effective because they reduce the overall number of pregnancies and those that may occur at a high risk period (e.g. birth interval less than 2 years). These interventions address the maternal mortality rate but not the ratio, because they don't influence the number of live births.

This Chapter has attempted to identify the important factors that need to be addressed in the prepregnancy period. Interventions during this period can make a difference in a women's life – enhancing her abilty to have a healthy pregnancy from the start – before a woman gets pregnant.

3

PREGNANCY RELATED FACTORS

I. ANTENATAL PERIOD

Pregnancy is a special time. There are many factors that will be discussed in this section highlighting the importance of a healthy antenatal period and factors that influence outcomes for both the mother and the newborn. These areas include beliefs and practices, nutrition during pregnancy, birth planning, and effective neonatal services.

A. *Beliefs and Practices During Pregnancy*

In many parts of the world, good health depends on maintaining a balance between "hot and cold"[29]. Pregnancy is considered a "hot" state, like the ripening of fruit. Overheating is dangerous, however swelling of hands and feet is considered a normal occurrence. Western medicine is believed to be "heating for the body" and thus dangerous. Therefore, if any conditions arise during pregnancy, they are treated with herbal (traditional) medicines to cool the body, rather than with Western medicine[24]. Many women do not seek regular (antenatal) check-ups since pregnancy is considered a normal state. Others do not admit that they are pregnant for fear of attracting evil spirits[29].

Many cultures do not understand reproduction, anatomy, or the birthing process. There is also confusion about the length of the gestation period. The Wan tribe in the Ivory Coast believes that infants are born at 10 months, 12 months, or even 18 months[29]. These beliefs significantly affect any discussions about expected delivery dates and have a substantial impact on provision of antenatal care, especially during the first trimester.

In many societies, pregnant women are advised to modify their diets by reducing their overall intake, usually to ensure an easier delivery. In an Indian study, most women expressed a preference for a small baby (under 2.6kg), as they thought it would be healthier[29]. In other cultures, women are told not to eat certain types of food and consume others. If these taboos restrict vital nutrients, they can negatively affect both the mother and baby.

Some cultural norms dictate that women be secluded in their homes or their mobility limited during certain times, such as menstruation, pregnancy, or the first 40 days after giving birth. This severely limits women's access to health care services, because they must get their husband's permission and be accompanied.

B. Nutrition During Pregnancy

It is estimated that 20 to 45 percent of women of reproductive age do not get the WHO recommended 50 kcal/kg a day, let alone the 300 additional calories required during pregnancy. Both cultural beliefs and economic resources influence this idea of limiting intake. A study in India found that higher-income women consumed about 2,500 calories a day during pregnancy and gained an average of 12.5 kg. Poor women only consumed 1,400 calories a day and gained just 1.5 kg on average[21].

Caloric consumption is closely tied to energy expenditure. In one study pregnant women who continued to undertake heavy activity gained an average of 6.5 kg and their infants weighed an average of 3,068 grams, while those with low levels of physical activity gained 9.2 kg and their infants weighed an average of 3,270 grams[21]. Another study in West Africa found that women given food supplements during the wet season, when energy expenditure is low, had babies with higher birth weights, while women given supplements in the dry season, when energy expenditure is high, saw no increase in birth weights. **The combination of reducing energy expenditure and increasing caloric consumption is the most effective strategy for increasing birth weight[21].**

The combination of reducing energy expenditure and increasing caloric consumption is the most effective strategy for increasing birth weight.

Micronutrient deficiencies: Micronutrient deficiencies are directly related to poor diet quality and quantity. The most common deficiencies are iron, folic acid, Vitamin A and iodine.

Iron deficiency diminishes the ability to fight infection and causes anemia. ***Maternal anemia (Hb below 11g/dl) affects about 500 million women of reproductive age worldwide.*** Anemia often has several causes, but results primarily from inadequate diet, low absorption of iron, or iron loss. Other nutrient deficiencies in folic acid and Vitamins A and C also contribute to anemia. If these nutrients are available in adequate amounts, they enhance iron absorption. Diseases such as malaria and hookworm also significantly contribute to anemia[38]. Iron supplementation for adolescent girls before they are pregnant can greatly increase their iron stores. (See Chapter 5 , Section IV, for treatment protocols.)

Vitamin A is needed for a strong immune system and prevention of night blindness. Several studies in South Asia have found that women who have night blindness consume a poor diet in general and suffer from protein energy malnutrition (PEM); they are more likely to be anemic; and they are more susceptible to infections. This once again stresses the importance of working with women to get adequate Vitamin A sources in their diets before they get pregnant[39]. (See Chapter 5, Table 5.6, for treatment protocols.)

Iodine is needed for adequate physical and mental development of the fetus. Deficiency in iodine also increases the chances of miscarriage, stillbirth, and premature birth. A child born to an iodine-deficient mother is more likely to suffer from mental retardation, cretinism, and poor muscle coordination. **About 250 million women suffer the effects of iodine deficiency and nearly one third of Africans (181 million) live in iodine deficient areas** [20, 40]**.**

C. *Birth Planning/Pregnancy Preparedness*

Planning for births is not a common concept in most developing countries. Pregnancies are often not acknowledged until there are visible physical signs (6-7 months). This lack of planning leads to the "four delays" discussed earlier in this manual that contribute to illness and death. It is important to encourage women and their families to think about the practical aspects of seeking obstetric care prior to an emergency. Young adolescents, especially primagravidas, first pregnancy, are often vulnerable because of their immature physiology, lack of access to accurate information, and antenatal services, and limited decision-making abilities. Services need to be designed to meet the special needs of this population.

TABLE 3.1
KEY ELEMENTS OF BIRTH PLANNING/PREGNANCY PREPAREDNESS

- ✔ Inform women on what they should expect during pregnancy, including their expected date of delivery and self-care during pregnancy (e.g., nutrition and reduction of workload).
- ✔ Know and recognize danger signs for the mother during pregnancy, childbirth, and the post-partum period.
- ✔ Promote the importance of having a skilled provider attend their delivery.
- ✔ Know which health facility to go to if a complication arises.
- ✔ Know how to get to that facility.
- ✔ Encourage the development of a plan to pay (savings/loan) for those services.
- ✔ Understand the importance of immediate and exclusive breastfeeding.
- ✔ Educate women and their families to recognize the danger signs for newborns.
- ✔ Educate women about their return to fertility and FP options available to them.

D. Antenatal Care Services

The literature debates how effective antenatal care is in reducing maternal and neonatal mortality and morbidity. It appears that antenatal care can make the biggest contribution through birth planning, providing iron and folic acid (IFA) to women with mild and moderate anemia, detecting pregnancy-related complications and making prompt referrals, and treating common illnesses such as malaria, hookworm, viral hepatitis, and STIs.

1. Do Screening Programs Work?

In the past, women were screened to determine who was at ***high risk*** of developing complications. Criteria, referred to as the "four toos", presented below, was used to screen women for this purpose. Women who were:

- ➔ too young (less than 15 years);
- ➔ too old (greater than 35 years);
- ➔ too often (birth interval shorter than 24 months); and/or
- ➔ too many (greater than five pregnancies).

In many countries, 50 to 60 percent of pregnancies are considered ***"high-risk"*** using these screening parameters. However, we know that studies have shown that usually 15 percent of pregnant women will develop complications requiring emergency obstetrical care.

Pregnancy-related complications cannot be predicted or prevented but they can be treated.

Classifying the majority of the population as "high risk" does not help identify those women who will require obstetric care. If all of these women actually sought services, the hospitals would be overwhelmed. In addition, some "low risk" women will need these services, but in many countries they are not given adequate information because they are not considered "at risk".

Studies have found that the majority of screening programs are not sensitive enough to successfully identify the majority of women who will need specialized obstetrical services.

An antenatal care program in Kasongo, Zaire used previous history of obstetric complication as a screening parameter to identify which women would develop obstructed labor. Women with a history of obstructed labor were considered "high risk" and women without such a history were classified as "low risk". The program identified 156 women out of a total of 3,614 as being at a "high risk" for developing obstructed labor[41] (See Table 3.2).

TABLE 3.2
ANTENATAL PROGRAM IN KASONGO, ZAIRE

	BAD HISTORY (HIGH RISK)	GOOD HISTORY (LOW RISK)	TOTAL
All Women	156	3,458	3,614
Obstructed Labor	15	36	51
No Complication	141	3,422	3,563

Source: Maine 1993

Many conditions defined as "risk factors" are in fact complications that required treatment (e.g., anemia, STIs, or high blood pressure). Therefore, a risk approach should not be used to determine whether women need maternal care. All women need access to good maternal health services.

When the women gave birth, 51 women developed obstructed labor. Although this is a small percentage of the total numbers of births (1.4%), this is only one of the obstetrical complications that can arise. Of those women that developed obstructed labor, 36 had good histories and the other 15 had been identified as being high risk. **This means that the majority of women who developed a complication were considered low risk. In addition, the majority of women (90%) who were considered "high-risk" delivered without difficulty.** Therefore, this screening program correctly identified less than a third of the women (29%) who ended up needing obstetric service[41].

Although the overall percent of women who developed complications in this study is quite low (1.4%), of those that did develop complications a large number (36/51) came from those women identified as "low risk."

This example highlights the fact that pregnancy-related complications cannot be predicted. It also stresses the importance of providing ALL pregnant women with adequate information about the danger signs and actions required if a complication should arise, regardless of their risk level.

Although there is some consensus on risk factors such as age, parity, previous pregnancy history, and birth interval, there is less agreement on the cut-off points of these factors. For example, the internationally recognized standard for short stature is 145 cm, but this may be inappropriate in some settings. Research needs to continue to identify better screening parameters to more accurately determine which women might develop complications (See Chapter 5).

The literature strongly suggests that risk screening be shifted to focus on educating women, men and family members on the danger signs and actions required to access maternal health services if complications arise.

Pregnancy-related complications cannot be predicted. ALL pregnant women need adequate information about the danger signs and actions required if a complication should arise.

2. Antenatal Procedures

Pregnancy histories are important because they can (if properly done) identify previous pregnancy-related complications that may increase a woman's risk of developing another complication. However, studies have found that at least 25 percent of significant obstetrical complications are missed when histories are taken. In one study, retained placenta was only correctly noted in 68 percent of all the women who actually experienced this complication[21].

Millions of women in the developing world are undernourished and/or suffer from micronutrient deficiencies[17]. There is quite a bit of debate in the literature concerning the correlation of the mother's weight gain in relation to the birth weight of the newborn. Pregnant women are often weighed as an indicator of poor nutritional status and then counseled if the required amount of weight is not gained. **The factors that affect birth weight the most are the woman's nutrition level (including iron stores), quantity and quality of calories consumed, and energy expenditure (workload). (See Chapter 5 for further discussion.)**

STIs, including HIV/AIDS, are the second most prevalent cause of morbidity for women in the developing world, as measured by the DALYs[5].

Blood pressure is usually taken to monitor the onset of pre-eclampsia or eclampsia, although women with current hypertension should be monitored closely. Pre-eclampsia and eclampsia are not well understood conditions, but they are associated with a rise in blood pressure, generalized swelling (edema) and protein in the urine. Although research has found that blood pressure and edema only identify about half of all women with these conditions, they are still sensitive enough to warrant monitoring[4, 20] (See Chapter 5).

3. Screening For Sexually Transmitted Infections

Limited awareness of sexual health, poor health seeking practices, inadequate partner identification treatment programs, and lack of quality reproductive health services for management of STIs leads to many complications. The impact of these infections on women's health and fertility can be severe due to ascending infections from the cervix, and an increased risk of cervical cancer and HIV.

STIs affect up to 10 percent of people of reproductive age. STIs, including HIV/AIDS, are the second most prevalent cause of morbidity for women in the developing world, as measured by the DALYs[5]. While HIV/AIDS has received the majority of attention (5.85 million cases in 1997) we know that the consequences of STIs can also be severe, causing blindness in newborns, spontaneous abortion in pregnant women, and infertility in both men and women.

In many regions, prevailing attitudes and norms of gender power hinder women's ability to demand safe sex or to protect themselves from unwanted or risky sexual relations. More than 80 percent of women are infected by a male sex partner ,and a woman's risk of acquiring an infection during unprotected sex is two to four times higher than a man's. Additionally, younger women's physiology puts them at greater risk of contracting HIV infection. In many developing countries, particularly sub-Saharan Africa, infections in adolescent girls outnumber those in adolescent boys by a ratio of two to one. It is estimated that between 50 and 80 percent of STIs in women go unrecognized and untreated[98].

Of all those who are HIV positive, 45 percent are women and half of all new infections are among persons between 15 and 24 years of age[19]. Research clearly indicates that when either partner has an STI there is a dramatic rise in the transmission of HIV/AIDS (See Newborn Section IV for a discussion on vertical transmission).

Few programs have been successful in implementing large scale interventions for screening and treatment of STIs among pregnant women and their partners. Some programs have worked on a small scale, which has significantly improved women's health and birth outcomes.

The combination of these factors make women, particularly adolscent girls, especially vulnerable to acquiring an STI and potentially HIV.

II. CHILDBIRTH

A. *Beliefs and Practices during Childbirth*

Typically women are not confined to bed during childbirth. They walk around, use a chair or tie a rope to a roof beam for support. A survey of 76 non-Western societies revealed that women in 62 societies assumed a sitting or squatting position during childbirth. The use of herbal medicine and abdominal massage to relax the laboring woman is considered beneficial in many settings[29].

Some cultures think that organs can become displaced, particularly the placenta, that can rise up and choke the woman. Others believe the uterus will move, thus a binder is worn to stabilize the uterus[24]. Feeding the woman oil or putting her hair or fingers in her mouth to induce gagging or vomiting seem to be fairly widespread practices, especially during prolonged labor or if the placenta has not been delivered[24]. In many traditional cultures, prolonged labor is believed to be caused by external forces or evil spirits. For example, in West Africa it is thought that prolonged labor occurs because the woman had an affair[20].

Heavy bleeding, on the other hand, is considered a cleansing process and not viewed as a problem. Many birth attendants lubricate the vagina with butter or coconut oil to make it more slippery[29].

The placenta is very important in many cultures and is thought to have a special relationship with the infant. Some people believe that the cord should not be cut until after the placenta is delivered. Once the cord is cut however, the mother and child may be considered polluted and must be isolated.

B. Unattended Home Births

As stated in Chapter 1, **the majority of births (63%) in the developing world occur at home with a large proportion (47%) being assisted by untrained personnel.** High rates of home deliveries with untrained providers is the most pronounced in Africa, followed by Asia[6] (See Table 3). This means that 60 million women annually give birth with an untrained attendant, family member, or alone. In rural Nepal, self-delivery is preferred because women avoid ritual debt and embarrassment[11].

TABLE 3.3
HOME BIRTHS AND TRAINED ATTENDANTS BY REGION

REGION	ANNUAL BIRTHS IN MILLIONS	AT HOME	BY TRAINED ATTENDANT
Developed	17(12%)	05%	99%
Developing	125(88%)	63%	55%
Africa	28(20%)	66%	42%
Asia	85(60%)	67%	56%
LAC	12(08%)	34%	76%

Source: WHO Factbook

Although giving birth at home is not a risk factor per se, the list of factors below all contribute to delays in: 1) recognizing the problem; 2) deciding to seek services; and 3) reaching the health facility.

- Many TBAs and women in developing countries are not able to recognize danger signs indicating a complication.
- Many women do not know where to go if complications do arise.
- Many women live far away from facilities and lack transportation.
- Many women have insufficient resources to access services.
- Many women perceive services as inhumane or useless.

There is often distrust and suspicion between nurses, midwives, TBAs, and the communities which hinder the establishment of an effective referral system. In addition, in most developing countries, there is a shortage of nurses/midwives to provide quality care to all the women in a particular area who may need those services (See Table 3.4).

TABLE 3.4
SKILLED ATTENDANTS AT BIRTH BY COUNTRY

20% OR LESS OF BIRTHS WITH SKILLED ATTENDANTS		36%-21% OF BIRTHS WITH SKILLED ATTENDANTS	
Somalia	(02%)	Cambodia	(21%)
Chad	(15%)	Mali	(24%)
Equatorial Guinea	(05%)	Burundi	(24%)
Eritrea	(06%)	Sierra Leone	(25%)
Ethiopia	(08%)	Rwanda	(26%)
Nepal	(08%)	Mozambique	(30%)
Bhutan	(12%)	Laos	(30%)
Bangladesh	(14%)	Nigeria	(31%)
Guinea Bissau	(16%)	Guinea	(31%)
Niger	(16%)	India	(35%)
Yemen	(16%)	Guatemala	(35%)
Angola	(17%)	Indonesia	(36%)
Pakistan	(18%)		
Haiti	(20%)		

"Skilled" means attended by nurse, midwife or doctor trained in life-saving skills.
Source: WHO Maternal Health Around the World, 1997

C. Delays in Problem Recognition

In general, millions of women in the developing world are illiterate. They also have not been educated about danger signs, the causes of maternal death, and/or the risks associated with childbirth. This lack of knowledge significantly contributes to the delay in recognizing the danger signs indicating a problem.

TABLE 3.5
DANGER SIGNS FOR WOMEN

SEEK IMMEDIATE ATTENTION		
PREGNANCY	**CHILDBIRTH**	**POSTPARTUM**
Bleeding	Heavy Bleeding	Heavy Bleeding
Convulsions	Convulsions	Convulsions
Pale, Labored Breathing	Fevers, Chills, Discharge	Fever, Chills,
Headache	Labor Longer than 12 Hours	Discharge
Swollen Hands/Face	Malpresentations	
High Fever	Placenta Not Delivered	
Severe Abdominal Pain	in 30 Minutes	

Source: WHO, 1994

Women, their families and some community workers also do not know all the signs indicating that newborns are in danger. Several demographic and health surveys have shown that many women do not know the signs and symptoms of pneumonia, dehydration, or other infections for their older children, therefore it is unlikely that they would know what to do for their newborns. Newborns have a very small window of opportunity to receive care. This fact is exacerbated by lack of caretaker knowledge of danger signs and treatment, distance from facilities, cultural taboos, and inadequately trained and equipped health providers.

TABLE 3.6
DANGER SIGNS FOR NEWBORNS

SEEK IMMEDIATE ATTENTION	
AT BIRTH	**FIRST 7 DAYS**
Not Breathing	Hypothermia/Fever/Chills
Skin Color is Yellow (jaundice)	Jaundice
Skin Color, Palm and Soles of Feet are Blue (Hypothermia)	Labored Breathing (greater than 60)
	Convulsions
Unable to Suck	Unable to or Poor Sucking/Not Active
	Rigidity
	Diarrhea/Constipation
	Red Swollen Eyes with Discharge
	Redness and Discharge around the Cord

Source: WHO, 1996

Newborns have a very small window of opportunity to receive care, which is exacerbated by lack of caretaker knowledge, distance from facilities, cultural taboos, and inadequately trained and equipped health providers.

Families are often reluctant to take the baby out of the house. In some societies, if the baby is sick it is due to evil spirits and not conditions that can be treated by Western medicine. In Muslim countries, the mother and baby are secluded for the first forty days after the birth while in other cultures they don't take the baby out until after the naming ceremony in the second or third week of life. Lastly, the newborn often does not come in contact with a health provider until his/her first immunization, which may be at two to three months of age, so they are not being monitored during the crucial first week of life[9, 29].

D. Delays in Decision-Making

In many cultures, women have limited ability, if any, to influence decision-making in the household. This is closely associated with their low status in the family and society as a whole. Several studies have found that women are often subjected to or influenced by the beliefs of their mothers, mothers-in-law, or other female relatives. In addition, they usually need their husband's permission or that of other male family members before they can obtain care.

DECISION-MAKING

Fatima, 27, who lived in a remote Yemeni village, delivered her sixth child, but her placenta did not follow. An hour later she was bleeding heavily. Her husband was away and she could not go to the hospital without the permission of a male relative. By the time her uncle was found and Fatima was carried by stretcher 15 km to the nearest highway, she was dead.

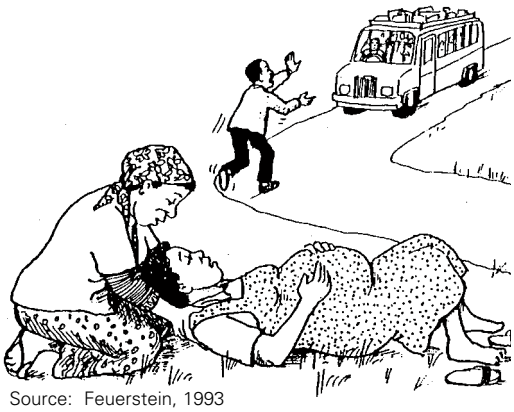
Family Health International Network, 1995.

The community's perception of the health system, both its infrastructure and providers, is based on past experience. If some women are seen promptly, given privacy and otherwise treated well, and if supplies are available and affordable, other women will usually attend. However, if some women are treated poorly and medicines are not available, then the other women will usually wait until they are close to death before going to the health facility. Other reasons why women hesitate to use health facilities are:

- health facilities are far away and it means leaving their family;
- women do not want to be examined by male doctors and there are no female health workers;
- hospitals are perceived as places to die;
- there is less privacy; and
- costs are higher.

E. Delays in Getting to the Health Facility

Getting women to the nearest appropriate referral site is an arduous task in many countries. A study in India found that 1 out of every 10 women who died as the result of pregnancy-related complications died on the way to the hospital[43]. Sometimes families do not know how to contact a transport worker, no transport is available, it is expensive, or security might be an issue (e.g. traveling at night).



Source: Feuerstein, 1993

Women often need to take several different modes of transport to reach the health facility. For example, in some communities in Bangladesh, a woman has to be carried in a homemade stretcher to the river, get a boat to the other side, and then find a vehicle to take her to the hospital. Delays can occur at any or all of these junctions.

In many countries, health services are supposed to be free. However, when there are no drugs available in the health facility, families must buy medicines and supplies from the private sector, often at very high prices. Then there are the additional costs of having a family member accompany the woman to the facility, return transportation, food and incidentals that have to be paid for by the family. Most families do not have liquid assets or money put aside for emergencies, so they must sell livestock, jewelry and other valuables. If this is not possible, families have to obtain loans at huge interest rates, causing yet another delay in access to services. In order to reduce the delay, families need to be taught how to plan, before the delivery, to deal with complications, should they arise.

Source: Feuerstein, 1993

F. Delays in Receiving Quality Maternal and Newborn Care Services

There are not enough trained midwives to reach the goal of reducing maternal mortality by 50 percent by the year 2000 set at the 1990 World Summit.

In most developing countries, health facilities are not adequately equipped to provide quality services. Institutions are useless in providing obstetric care if trained personnel, emergency medicines, supplies (IV fluids, needles, and antiseptics), blood, anesthesia, as well as electricity and running water, are not available on a regular basis.

The International Confederation of Midwives, WHO and UNICEF have determined that there are not enough trained midwives to reach the goal of reducing maternal mortality by 50 percent by the year 2000 set at the 1990 World Summit[44] (See Table 3.4). In many parts of Africa and Asia there may be only one midwife for every 300,000 people, meaning one midwife for every 15,000 births. According to international standards the recommended ratio is one midwife for every 5,000 people.

Many health personnel, even doctors, have not received adequate education or supervised practical experience to enable them to deal competently with life-threatening obstetrical emergencies. To make matters worse, health workers are frequently transferred and many have to work in environments where basic medicines and equipment are either non-existent or not functioning.

SITUATION ANALYSIS

In Bangladesh, Medical College Hospitals (MC) and District Hospitals (DH) are supposed to be equipped to provide comprehensive obstetrical services while Thana Health Complexes (THC – health centers), provide basic obstetrical services. In 1995 BIPHERT conducted a baseline study and found the following:

Personnel: An appropriate person was the head of the OB/GYN department in (100%) of the MC, (50%) of the DHs, and (25% of the THCs).

Drugs: MCs had drugs to meet 5% of patients' needs..

Manual removal of placenta: could be performed in (100%) of the MCs, (90%) of the DHs, and (16%) of THCs.

Anesthesia was available in (100 %) of the MCs, and (45%) of the DHs.

Blood banking was available in (100 %) of the MCs, and (65 %) of the DHs.

Separate labor wards were available in (100%) of the MCs, (90 %) of the DHs, and (62%) of the THCs.

Baby scales were available in (100%) of the MCs, (56%) of the DHs, and (48%) of the THCs.

Case Fatality Rates (CFR) were 2.1 percent for the MCs, 3.3 percent for the DHs and 1.7 percent for the THCs.

Source: BIRPERT, 1995

The results of the Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies (BIRPERT) study indicates that although the MCs have adequate staff who can perform the procedures, there is a serious shortage of medications. The DHs have shortages of personnel, some supplies, and even simple equipment such as baby scales. The THCs lack both trained personnel and simple equipment.

The BIRPERT study presented that lack of trained health workers, especially female physicians in rural areas, remained one of the main constraints to the provision of obstetrical services, despite a large training program undertaken by the government and UNICEF[45].

When health providers are not well-trained in diagnosis and treatment of life-threatening obstetric complications, services can be further delayed or even mismanaged. **A study in Mexico found that poor physician management was the primary cause of 83 percent of all the maternal deaths.** Misdiagnosis accounted for about 20 percent of deaths, and another 25 percent were due to surgical mismanagement[46].

Many studies have found that it is not enough to train staff and provide drugs and equipment. Maintenance and continuous feedback, such as case reviews, are needed in institutions and communities to ensure that essential systems that support obstetrical services, such as information management, inventory control, and counseling services, are operational.

Case Fatality Rate (CFR) is a useful indicator of quality of care because it compares the number of women admitted to hospitals to the number of women who die. The CFR reflects such factors as:

- ➔ the severity of the woman's condition upon admission;
- ➔ waiting time;
- ➔ workload and competency of the providers;
- ➔ availability of medicines, equipment, and supplies; and
- ➔ administrative systems.

In the BIRPERT study, the case fatality rates indicate that the THCs are probably referring most of their complications, which keeps their CFR lower. Higher CFRs in MCs and DHs are probably due to women arriving late, making management of complications more difficult[45].

An acceptable level for CFR is one percent of women admitted for complications to die. If the figures are above one percent, then it raises questions about the quality of care. Oftentimes, referral or district hospitals have higher rates because referrals are delayed and they get the most complicated cases, which are more difficult to treat. The PMM Network found case fatality rates ranging from 1.2 percent in Ghana to 14 percent in Nigeria[47].

DROP IN CASE FATALITY RATE, ZARIA, NIGERIA

In Zaria, a surgical theater was renovated, physicians were trained in life-saving skills, and emergency drug package and community blood donation systems were instituted. As a result, the mean time before treatment dropped from 3.7 hrs. in 1990 to 1.6 hrs. in 1995 and the CFR dropped from 14 to 11 percent in the same time period.

PMM Network

III. POST-PARTUM CARE

A. *Beliefs and Practices During the Post-Partum Period*

Women often receive more attention, better family support and are able to eat more in the post-partum period than during pregnancy, especially if the infant is a son[29]. Women are considered "cold" after childbirth and during lactation, so heat may be applied. In Mexico and Guatemala, new mothers take sweat baths, while in many parts of Southeast Asia, the practice of "mother roasting", where women have a small fire underneath their bed for the first few days after delivery, is common[29].

The majority of maternal deaths occur in the post-partum period, yet few programs target women during this time.

Where new mothers are considered polluted, especially in Muslim cultures, they are usually secluded for the first 40 days after delivery. This is also seen as a time when the woman is especially vulnerable to physical and spiritual forces. Protective measures include prayers, amulets and herbal baths. They may also be told to avoid interactions with people, the cold, and water. Breastfeeding right after birth, and for the first few days, is usually discouraged because of beliefs that colostrum is not fit for the baby[29].

Traditional beliefs guide and dictate practices during pregnancy and lactation. If health workers ignore traditional beliefs and practices, they may loose credibility and clients may only use health services in dire emergencies. Health care services must be provided in a culturally appropriate manner.

B. *Post-Partum Care*

As stated earlier, the majority of maternal deaths occur in the post-partum period, yet few programs target women during this time. If a complication arises during the post-partum period, the "four delays" discussed earlier also limit health seeking practices. Programs must do a better job in trying to reach women during this critical period, especially in areas where the majority of births occur at home. Women, household members and communities need to understand the importance of monitoring the woman in the early post-partum period and they must know what danger signs to monitor. Households and communities can play a key role, especially where home deliveries are common, because they have access to women and can encourage them to seek care if required. Women should be informed about their return to fertility and what contraceptive choices are available to allow them to safely space their pregnancies.

C. *Post-Abortion Care*

It is estimated that over 120 million women worldwide would like either to space their children at least 2 years apart or limit family size, but are not able to do so[33]. These women indicate a desire to use family planning, yet they are not using a method, indicating an unmet need. As a result many of these pregnancies are unwanted and result in abortions (See Table 3.7).

TABLE 3.7
PREGNANCY OUTCOME BY REGION

REGION	WANTED	MISTIMED	UNWANTED	ABORTION
Africa	76%	3%	11%	10%
Asia	63%	10%	9%	18%
LAC	38%	15%	19%	28%
U.S.	43%	19%	9%	29%

Source: Alan Guttmacher Institute, 1995

Neonatal mortality is rising as a proportion of overall infant deaths.

According to UN figures, 20 million unsafe abortions are performed annually, resulting in 80,000 to 100,000 female deaths[1]. Abortion is illegal in many countries, but even where it is legal this doesn't ensure access to quality services. Potentially life-threatening risks do not deter women from seeking or even self-inducing abortion. Many women are only successful in terminating their pregnancies after several attempts. A study in the Philippines found that on average women try three different methods before aborting: self-induction, hilots (traditional birth attendant) using heavy abdominal massage, or a practitioner who may or may not be skilled. Unsafe abortions often result in hemorrhage and sepsis, leading to death. (See Chapter 5 for more informaiton on Post-Abortion Care.)

IV. NEWBORNS

As stated in Chapter 1, every year almost 8 million fetuses/newborns die late in pregnancy, at birth, or soon after as the result of poor maternal care and/or inadequate management of pregnancy-related complications. Neonatal mortality is rising as a proportion of overall infant deaths – WHO estimates that 85 percent of newborn deaths are due to infections, birth asphyxia, and birth injuries (See Table 1.14). Maternal infections during pregnancy, such as malaria and STIs, and especially syphilis and HIV, have a negative effect on neonatal outcomes[12].

Many infections, such as malaria, anemia and STIs during pregnancy result in LBW babies. In addition, many studies have found that children are not taken for health care in a timely manner. The "four delays" described in Chapter 1 also apply to newborn care. In several studies, health workers have identified newborns as being sick (e.g. pneumonia), but the family refused to take them to the health facility because of traditional beliefs[9].

A. Infections

The organisms associated with neonatal infections vary by geographic region. Although Beta-Strep is the major organism that causes neonatal sepsis in the developed world, this is not the case in the developing world. **Most studies have found that gram-negative bacteria (e.g. Klebisella and Staphylococcal disease) are the most prominent causes in developing countries.** This finding has significant treatment implications. Many infections are preventable with vaccinations, while others can be minimized by timely identification and proper management [12].

TABLE 3.8
ESTIMATED GLOBAL BURDEN OF DISEASE: NEONATAL DEATHS

CAUSE	NO. OF CASES	NO. OF DEATHS	CFR
Birth Asphyxia		840,000	
Birth Traumas		420,000	
Neonatal Tetanus	600,000	560,000	85
Sepsis	750,000	300,000	40
Meningitis	126,000	50,400	40
Pneumonia	2,500,000	750,000	30
Diarrhea	25,000,000	150,000	
Premature Birth		410,000	
Congenital Anomalies		440,000	
Other		205,000	

Source: Stoll, 1996

As seen in Table 3.8, the CFR is quite high for tetanus, meaning that out of all the cases identified, 85 percent died as a result of tetanus. While neonatal sepsis has a higher caseload than tetanus, the fatality rate does not seem to be as bad. For all those cases of sepsis identified, 40 percent died. Acute Lower Respiratory Infections (ALRI), or pneumonia, contributes the largest amount of cases and deaths, however its fatality rate (40%) is not as high as that of tetanus.

Therefore, while it is more likely that newborns will acquire a case of pneumonia, their chances of survival are better. If a newborn contracts tetanus, they have a greater chance of dying. While it is useful to analyze the data this way, we must remember that these figures are probably unrealistically low because **the majority of newborn deaths occur at home and never get reported.**

The newborn is at risk for developing complications if quality services are not available on a timely basis. In many settings, the health staff is often not prepared to deal with a sick newborn brought to them. In India, Pakistan, Malaysia, and Thailand, the CFR for children brought to the hospital with neonatal sepsis ranged from 27 to 69 percent, which is very high. (NOTE: normal CFR is one percent.) This means that between one-fourth and two-thirds of the newborns admitted to these institutions died. These high rates indicate that training on correct diagnosis and identification with prompt, appropriate case management could make significant progress in saving newborn lives[12].

There are almost 500,000 cases of neonatal tetanus annually, the majority of which occur in 12 countries:

Bangladesh	**China**
Ethiopia	**Ghana**
India	**Indonesia**
Nepal	**Nigeria**
Pakistan	**Somalia**
Sudan	**Zaire**

Source: Stolls, 1996

Studies have found that there is a **4- to 10-fold increase in the risk of HIV transmission to the newborn in the presence of existing syphilis,** chancroid, and herpes infections, and a 2- to 4-fold increase in the presence of gonorrhea and chlamydia infection[28]. Maternal syphilis has devastating effects on the newborn (See Table 3.9).

TABLE 3.9
RESULTS OF SYPHILIS ON NEWBORNS

The effects on newborns for 40,000 pregnant women with a syphilis sero-prevalence rate of 5% are presented below.

2,000 pregnant women would be infected with syphilis

RESULTING IN

→ **400** spontaneous abortions

→ **600** stillbirths

→ **500** cases of congenital syphilis

→ **250** premature newborns

→ **250** healthy newborns

Source: Van Dam, 1996

The infant can be infected with HIV during pregnancy or at delivery (20%) and an additional 14 percent can be infected through breastfeeding[39] (See Chapter 5 for further discussion.) It appears that HIV positive women with Vitamin A deficiencies are more likely to transmit HIV to their children (MTCT)[22].

B. Low Birth Weight

Every year 22 million LBW babies are born who fall into two categories: those that are premature – born before 37 weeks – or those with Intrauterine Growth Retardation (IUGR) – babies who are full-term births but Small for Gestational Age (SGA). Most LBW babies in developing countries are due to IUGR, resulting from women with poor nutritional status, anemia, malaria, and sexually transmitted infections (STIs), either before conception or during pregnancy. Birth weight is crucial to the survival of the infant. Studies have found that normal infants in the developed world have a mortality rate of 2/1,000, while LBW babies have a mortality rate of 86/1,000. If LBW babies survive, they have greater rates of illness which may result in death or delayed neurological development (i.e., poor vision, decreased educational attainment)[9].

Worldwide, of the estimated 10 million women infected with HIV/AIDS each year, two million women become pregnant – the majority of these women do not know their HIV status. Pregnancy can aggravate the infection, drain strength and energy, reduce their immune system and make women more susceptible to anemia and multiple infections.

Each year, HIV/AIDS is transmitted (MTCT) to approximately half a million infants – **1400 every day** – in the developing world by HIV infected women. **Sixty-seven percent of these infants are born in Africa and 30 percent in East Asia and India.** The IMR and CMR is expected to double or triple in certain countries in Eastern and Southern Africa (Zimbabwe, Botswana, Zambia, and Malawi) due to MTCT between now and the year 2010[98].

V. CONCLUSION

This Chapter has tried to describe the various factors that influence maternal and neonatal mortality and morbidity during pregnancy, childbirth, and the post-partum period. In the antenatal period this encompasses understanding the beliefs and practices of the local culture, adequate nutrition, promotion of planning for childbirth, and a review of antenatal procedures and their effectiveness. The factors that play a role in childbirth include delivery practices, the proportion of home deliveries and institutional deliveries, types of providers that attend deliveries, and the delays in problem recognition, decision-making, obtaining services, and receiving services. The post-partum period has two main components: post-partum and post-abortion care. Chapter 3 also tried to discuss the major factors that affect newborn outcomes, primarily infections and low birth weight. In summary, it is clear that there are a multitude of factors that influence maternal and neonatal outcomes.

4

PROGRAM DESIGN, MONITORING, AND EVALUATION

I. BACKGROUND

Less than a century ago, there was little that the medical profession could do to prevent or treat pregnancy-related complications. Looking back at England in the 1930s, one would find maternal mortality ratios as high as those in the developing world today.

Many countries have Safe Motherhood policies, but they may not be comprehensive or fully implemented. These policies may include components that address age of marriage, availability of medical termination of pregnancy, access to family planning services, divorce and inheritance laws, women's education, and female circumcision. In the past, most maternal and child health (MCH) programs have focused more on children's health and to a lesser degree on the maternal component. Table 4.1 shows the difference between the traditional MCH approach and the new Safe Motherhood approach, ensuring a maternal health as well as child health focus.

TABLE 4.1
DIFFERENCE IN APPROACHES TO MATERNAL HEALTH

THE OLD APPROACH	THE NEW SAFE MOTHERHOOD APPROACH
✔ Neglected the "M" in MCH. ✔ More emphasis on child health. ✔ Narrow view of maternal health. ✔ Saw maternal health as antenatal care, delivery, TBA training and FP. ✔ Technically-based, mostly improving health provider practices. ✔ MCH part of preventive care. ✔ MCH often separate from FP. ✔ Poorly defined referral mechanism, especially for obstetric emergencies. ✔ Social context of maternal health neglected. ✔ Not enough midwives/supervisors. ✔ Vast list of high risk factors and indicators ("at risk" approach). ✔ Tendency to "sit and wait" for mothers/women to come to health services. ✔ Neglected problems of abortion. ✔ Neglected maternal morbidity. ✔ Used didactic "top down" approach.	✔ More balanced view/practices for both maternal and child health. ✔ Broader view of maternal health. ✔ Emphasizes idea of "reproductive health" including intrapartum, postpartum, post-abortion, and STIs. ✔ Technical side also linked to education/involvement of women. ✔ Maternal care better linked to obstetric services in the hospital; FP seen as integral part of maternal health services. ✔ Established low cost, referral mechanisms. ✔ Stresses social context (poverty). ✔ Trains more midwives to be practitioners and supervisors. ✔ Selects a list of manageable risk factors ("danger signs" approach). ✔ Faces the fact that unsafe abortion causes maternal mortality/morbidity. ✔ Participatory approaches used to enable health staff, mothers and communities.

Source: Feuerstein, 1996

Programs that "listen to women" by eliciting their opinions and preferences before the service interventions are designed, have proven to be more effective. There is often a lack of understanding about the daily realities which these women face. A wide gap also exists between the Western-oriented perceptions of health and the traditional beliefs held by women.

Source: Feuerstein, 1993

We need to understand that people's medical decisions are often based on non-medical rationales; people do not think of what is medically sound, but what is culturally appropriate. The medical community needs to understand that their services are in competition with alternative health services. Understanding and designing programs that reflect the realities expressed by women is critical to ensure that the services will be utilized.

Increasing access to maternal health services does not have to be costly. The PMM (Prevention of Maternal Mortality Network) found that most interventions required small amounts of resources, for example, fixing an outlet so the generator could work, to improve services. Most of the projects undertaken by the PMM were co-financed by the U.S. government and cost less than U.S. $25,000, including minor renovations and equipment[45].

Today, the continued toll on maternal health is even more unacceptable because cost-effective and efficacious methods to prevent them are known and used throughout the industrialized world. **An investment of U.S. $3 per person per year can prevent the overwhelming majority of maternal deaths, half of all infant deaths, and often life-long disabilities that affect millions of women in developing countries[6, 7].** This $3 amount includes the cost of basic antenatal care and nutrition, assistance at delivery with a skilled provider, neonatal care, promotion of family planning during the post-partum period, and special care for complications[98]. WHO has developed a tool for estimating the cost of implementing the Mother-Baby Package.

A balanced approach of reducing the distance between women and health services requires two complementary strategies – bringing care closer to women and bringing women closer to care.

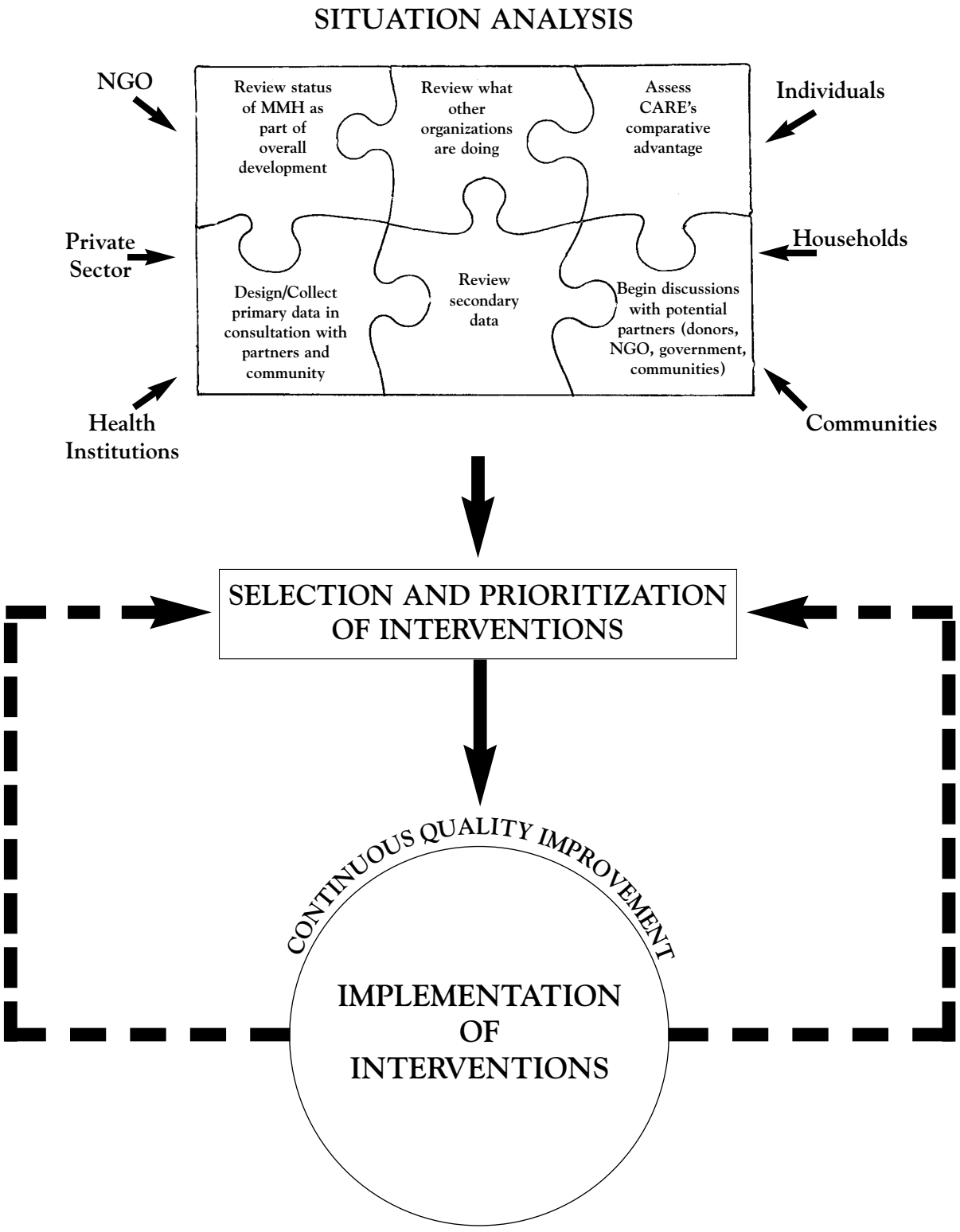
A balanced approach of reducing the distance between women and health services requires two complementary strategies – bringing care closer to women and bringing women closer to care[8, 13]. Experience has shown that there needs to be balance between upgrading services and mobilizing the community. **If one is done without the other or if activities are mistimed, the efforts will be unsuccessful.** It is vital that program interventions address the most important aspects of these issues.

CHALLENGES FOR THE NEXT DECADE

- ➔ **Improve women's participation in decision-making,** including the number and timing of children, access to health care services, and control of resources.
- ➔ **Empower women and their families to adopt healthy behaviors,** plan for births and complications if they arise, (including knowledge of danger signs), and offer information on location of obstetric services, how to get there, and resources to pay for services.
- ➔ **Encourage men** to support and promote women's access to reproductive health services.
- ➔ Continue to support successful family planning and maternal health programs, and **scale up small pilot projects to the national level.**
- ➔ Work to ensure that all the **essential linkages needed for an effective referral system** are in place, including adequate transportation systems and resources to pay for transportation and obstetric services.
- ➔ Communicate specific messages to promote and sustain **behavior change** in a culturally acceptable manner. Messages should empower women and their families to demand that services be available and reflective of the communities' needs.
- ➔ **Ensure access to "Mother Friendly" obstetric services 24 hours a day** with adequate drugs, supplies, equipment, and skilled personnel that can provide quality services in a culturally and women-sensitive manner.
- ➔ Work to ensure that services meet the special needs of **adolescents** and women that suffer from abuse and violence, and that there are provisions for complications from unsafe abortions.
- ➔ Develop **better indicators** and measuring systems to document progress in reducing maternal deaths, morbidities and newborn deaths.
- ➔ Increase/sustain **government and political support/ resources** for maternal health programs.

The challenges for the next decade are diverse and complex. In order to ensure that we have effective maternal health programs that can achieve impact – reduced maternal and neonatal mortality and morbidity – a strategic, comprehensive approach is needed. In many settings, we have not been systematic enough in our data collection or analysis. Additionally, we often do not select interventions based on our analytical assessment. Therefore, the following sections describe approaches that may be taken for data collection, analysis and selection of effective interventions with an explicit understanding that these steps need to be created through an iterative process, as depicted in Figure 4.1.

FIGURE 4.1
PROGRAMMING FRAMEWORK



II. ASSESSING THE MATERNAL HEALTH SITUATION

When designing a maternal health program, one needs to examine the magnitude and causes of maternal death, the level of infrastructure, accessibility and use of health services, and other efforts to address this problem. In addition, there should be an environmental analysis to understand the role of government, private providers and NGOs in the area, and what donors are supporting to foster effective partnerships. This section describes several ways to collect maternal health data including some questions to use when appraising the maternal health situation in a specific context and a framework to analyze the data.

A. Environmental Assessment

An environmental assessment, a broad review of the operating environment, can be done as part of data collection, or it can be done initially to get a sense of the situation and then done more in-depth during the data collection phase. This will depend somewhat on the understanding of the situation and the secondary data available. For example, it was easy for CARE in Bangladesh to do an initial environmental assessment because we have a long history in Bangladesh and there is ample data. Regardless of when you decide to do the assessment, it is important and can give valuable insight into where your organization can be the most effective.

The first step of the assessment is to understand your own organization's strengths and weaknesses.

CARE is engaged in a broad-based effort to reduce poverty through programs in agriculture, natural resource management, income generation, education, health and emergency relief. These diverse efforts are unified through the Household Livelihood Security Framework, which is the organizing construct for CARE's programming. This holistic approach helps CARE bring together programs at the household level to work towards poverty reduction.

A fundamental feature of CARE's current and future health programming is the foundation provided by the Health Security Framework, which is defined below.

Health security is achieved when households are able to identify, prevent and manage significant risks to their health.

The second step of the assessment is understanding the essential components needed for effective programming.

Health security is a useful framework when looking at what essential components are needed to ensure good maternal and neonatal programming. In terms of maternal and neonatal health, this means assessment of the health risk to mothers and newborns utilizing qualitative and quantitative methods. This data needs to be reviewed in terms of the following components, which we believe are essential to address the complex problems of maternal and neonatal deaths.

- ➔ **Optimal health interventions:** Experience and research tell us what are the optimal health interventions, which may be either preventive or curative, for each major cause of mortality/morbidity. For example, there have been major advances in our understanding of the role of emergency obstetrical care in maternal health. Where effective technical packages exist, then the task is to promote the use of optimal health technologies. CARE focuses much of its effort on bringing simple, effective technologies to bear. However, clear technical solutions are not always apparent; then CARE can play a useful role in testing alternatives.
- ➔ **Healthy behaviors within the household:** Many of the risks experienced by poor households can be mitigated at low cost through behavior change at the individual and household level. Maternal health outcomes could be improved dramatically through increased use of family planning, and preparing for the possibility of complications during birth.
- ➔ **Community empowerment:** Conventional approaches to improving health status have focused largely on the supply side (e.g., increasing the capacity of health providers to deliver services). Community empowerment can play a key role in behavior change and demand generation. Of particular importance is strengthening the influence of community health organizations controlled by women and focused on the health priorities of women.
- ➔ **Institutional capacity:** The management of health risks also requires that health institutions have the requisite capacity. The term "institutions" must be understood broadly, covering the range of suppliers of health services, including public, private not-for-profit, traditional and private for-profit providers. Capable institutions possess the following skills: facilitate access to the services and commodities needed to address the principal health risks; ensure the quality of services consisting of the technical competence of providers, client counseling, respect for the dignity and confidentiality of the client, client follow-up, and the physical setting of care; effective management systems such as planning, human resource management, monitoring and evaluation, drug and commodity supply, equipment and facilities management, and financial management.

➔ **Appropriate public health policies:** Public policy may or may not support the application of appropriate health technologies and/or the promotion of appropriate health behaviors relative to the greatest risks to health. Where local policy is hindering the application of appropriate technologies, systems and behaviors, dialogue among the concerned parties should be fostered to help move public policy towards support of optimal and sustainable technologies and behaviors.

The third step is knowing what other organizations are doing in the local context.

As stated previously, no one organization can adequately address the problems of maternal and neonatal deaths. Thus, partnership is key to dealing with this complex problem. A "mapping" exercise, both geographic and technical, can be very useful to determine gaps and identify potential partners for strategic alliances. "Technical mapping" can be done by reviewing the operating environment, undertaking a SWOT analysis, learning about what other organizations are doing, and understanding donor priorities.

EXAMPLE OF ENVIRONMENTAL ASSESSMENT

After a review and analysis of the data in Bangladesh, a technical mapping exercise, CARE/Bangladesh found that:

1. USAID has a $300 million project for FP.
2. SIDA has a large project to do abortion and post-abortion care.
3. UNICEF is working in 11 districts at the district hospitals and a few thana health complexes to upgrade the EOC services.
4. ICDDR,B has done some small successful pilot projects, but it has not gone to scale.
5. The Government of Bangladesh is very supportive of all the initiatives.
6. Several donors, such as CIDA are interested in supporting community interventions.
7. Few organizations are working at the community level to mobilize use of services.

As a result of this process, we developed the program depicted in Figure 4.3.

B. Data Collection

Since maternal and neonatal deaths are not solely a medical problem it is important to collect data from many different perspectives to be able to identify barriers to maternal health services (See Table 1.1). While quantitative data can be useful in identifying the magnitude of the problem, it is less effective in capturing attitudes and practices. Therefore, it is necessary to collect both qualitative and quantitative data to fully understand the situation and select the most effective interventions for that context. Both

quantitative and qualitative data can be collected in the community as well as in health institutions. **Since the majority of women and newborns die at home, it is essential to collect data from the community.** Hospital-based surveys significantly underestimate the problem and are not able to capture many of the barriers to care that occur outside of the health institution.

Quantitative data collection: This can be primary or secondary data. It usually includes gross indicators of health status (e.g., MMR, IMR, TFR, CPR, coverage rates) and a reflection of the availability and accessibility of the health infrastructure (e.g., available equipment, health facilities per population, use of facilities).

Quantitative data collection tools in the health institutions may include; structured record reviews, structured interviews with clients, and health facility assessments. Instruments to be used in the communities usually consist of Knowledge, Attitude and Practice (KAP) surveys or some adaptation. There are many surveys available (e.g., DHS module on maternal mortality, WHO Health Facility Assessment, ACNM Assessment) that have been tested and can be adapted. These tools are characterized by closed-ended questions.

Qualitative data collection: In many countries there is less qualitative data available, so secondary data is less of an option. While quantitative data gives you a general idea of the magnitude of the problem, qualitative information helps one understand the "whys."Qualitative information can include:

- birthing beliefs and practices;
- women's perception of health facilities and staff;
- reasons why women do not want to go to the health facilities;
- decision-making processes; and
- medical belief systems.

Instruments to collect qualitative data encompass focus groups, participatory approaches (e.g., PRA, PLA), and verbal autopsies.

Focus groups, guided discussion groups, can provide more in-depth information on many topics, particularly in regard to beliefs, perceptions and issues that affect quality of care. They are useful to further explore trends seen in the quantitative data to better understand the reasons behind these trends.

Participatory approaches, such as participatory rural appraisals (PRA) or participatory learning in action (PLA), are another alternative to collecting qualitative data to gain insight into the "whys" of the problems that may be identified. These methodologies are concerned with the transformation of existing activities to try to improve people's conditions. These approaches involve the community more than focus group discussions, through community group analysis and interaction. Therefore, these approaches are usually able to collect richer data. Typically, there is involvement from sev-

eral parts of the community (e.g., men, women, elders, providers) to collect a diversity of information. Since data is collected from several sources, it is important to triangulate this data (cross-reference through the use of different tools that collect the same data in different ways) to ensure its validity. A variety of tools (e.g., village mapping, reproductive life cycling) can be used to assist the community in describing their situation and beliefs. The aim of these approaches is to enhance the learning of all the participants.

Verbal autopsies can be done in the institutions, sometimes called case reviews, and in the community. They allow more data to be collected to glean why a woman or newborn died. In many countries the majority of maternal and newborn deaths occur at home, so this type of approach, that delves into what role delays in identifying the problem, deciding to seek care and getting transportation contributed to the death is important. If the verbal autopsy is only done in the hospital, this type of information will probably be overlooked.

QUESTIONS TO USE WHEN APPRAISING THE MATERNAL HEALTH SITUATION

(Source: Campbell, et al. Off to a Rapid Start. International Journal of Obstetrics and Gynecology, Vol. 48)

SOCIAL AND ECONOMIC STATUS

What aspects of women's social and economic status adversely affect safe motherhood? What are the social and economic consequences of a mother's illness or death? What happens to her children?

POPULATION AND FERTILITY

What population is at risk? Does the fertility pattern contribute to unsafe motherhood? What, if anything, is being done to reduce fertility and prevent unwanted pregnancy?

HEALTH POLICY

What is the present commitment to Safe Motherhood? What resources are available to reduce maternal mortality and related morbidities? What is needed for a functioning referral system? What resources are available for getting the messages on maternal health to women and their families? What laws, health sector policies, and customs affect maternal health (abortion, delegation of responsibility, age of marriage, and women's mobility)?

MATERNAL MORTALITY AND MORBIDITY

What is the maternal mortality ratio or rate? What are the main causes of maternal death? Do these include indirect causes? If representative maternal mortality indicators do not exist, how might they be obtained? What is vital registration coverage and completeness? What is the number of female deaths in the age group 15 to 49? What is the number of maternal deaths? What percentage of births are registered? What percentage of births take place in hospitals? What are the major causes of maternal morbidity? What is the level of maternal malnutrition? What are other possible indicators of maternal health?

QUESTIONS TO USE WHEN APPRAISING THE MATERNAL HEALTH SITUATION (cont.)

(Source: Campbell, et al. Off to a Rapid Start. International Journal of Obstetrics and Gynecology, Vol. 48)

PERINATAL AND NEONATAL MORTALITY

What is the neonatal mortality rate? What are the main causes of neonatal death? How many stillbirths are there in a year? Do these include indirect causes? If representative neonatal mortality indicators don't exist, how might they be obtained[50]?

COMMUNITY OUTREACH, PROMOTION AND EDUCATION

What perceptions, beliefs and practices affect health status and use of services? What avenues are available to reach women and their families with messages about maternal health and care?

- ➔ What type of community (agricultural, peri-urban)? What is the location of community, access (distance) to health facilities, seasonal barriers such as flooding, available transport? What are the views of village leaders about health services? What are the common health problems (malnutrition, anemia, malaria, hookworm, STIs)?
- ➔ What is the role of women in the community? Are they educated? Do they have mobility or do they have to be escorted? What is their livelihood? How many children do women have?
- ➔ Who are the decision-makers in the household? In the community? What are the traditional beliefs? And practices? What do women think about the health care system (antenatal care, delivery, newborn care)? Do women use health services? Why/why not? Which ones?
- ➔ Who are the health providers in the community (TBAs, village doctors, private providers)? Have they had women die? Do they refer them to the health facilities? Why? Why not?
- ➔ Where do deliveries occur (husband's house, mother's house, cow shed)? Who attends them? Do they attend the whole delivery or only cut the cord? How long does this person stay with the woman? What is used to cut the cord? When is breastfeeding initiated?
- ➔ What practices do people use if a woman experiences a complication? Who makes the decision about seeking services? Do women and their family members know the danger signs? What are the main barriers to accessing and receiving care[50]?

QUESTIONS TO USE WHEN APPRAISING THE MATERNAL HEALTH SITUATION (cont.)

(Source: Campbell, et al. Off to a Rapid Start. International Journal of Obstetrics and Gynecology, Vol. 48)

CHARACTERISTICS OF SERVICE ORGANIZATIONS AND THEIR USE

Who delivers the woman and where is she delivered? Who can handle obstetrical complications, especially emergencies, and where can they be managed? What formal linkages exist between the provider who delivers the woman and these services for managing obstetric complications? What are barriers to use of these services?

- ➔ What is the type of institution (catchment area and services to be provided)? Current number of deliveries? What is the percentage of complications that the institution delivers? Estimated number of pregnancy-related complications?
- ➔ What is the relationship between the institution and the community? Do the health providers know the village health workers? How are they treated if a woman is referred to the institution?
- ➔ Are there adequate personnel to provide services? Are the health providers adequately trained to manage life-threatening complications? Are services available 24 hours a day? Are adequate medicines (including antibiotics, oxytoxics, anti-convulsants), medical supplies, blood, anesthesia, and equipment available on a regular basis?
- ➔ Do administrative procedures (such as admission, blood type/cross) facilitate women receiving prompt treatment? Does the record keeping system keep track of women admitted with complications? Are records sent with the woman if she is referred? How long do women with complications stay in the facilities? Are there any mechanisms for follow-up in the community? Are there regular supervisory visits? Is there a mechanism for case reviews with the staff[50]?
- ➔ What type of institution (catchment area and services to be provided) is it? What are the current number of deliveries? What is the percentage of complications? What is the estimated number of pregnancy related complications?

C. *Analysis of Data*

Once the data is collected, then the questions are: How do you analyze it? and What does it mean? Some interventions may have greater levels of impact in certain settings. The World Bank has classified countries into three general categories. CARE has refined this framework by using specific indicators to classify settings based on similar characteristics[6,48,49,51]. These settings can be either at the national level or an area (e.g., region, state, district) with these similar conditions.

Table 4.2 attempts to provide a framework to assist program managers in the analysis of second data, mostly from national demographic and health surveys. We believe that this can be useful as a filter or first cut to analyze available secondary data. It may assist managers in identifying: 1) if there is a maternal health problem; 2) the magnitude of the problem; 3) key areas of weakness; and 4) where more data may need to be collected to better understand the problem and design effective interventions. This tool is much better at identifying problems with access to maternal health services than quality of those services. This is due to the fact that many aspects of quality of care are difficult to measure through quantitative methods.

We realize that many countries may not have all this data. Other indicators may be substituted as proxies for the indicators presented in Table 4.2. For example, in many countries syphilis prevalence among antenatal women may be difficult to obtain, but STI prevalence may be used as a proxy.

This table is not meant to be totalled. It is very likely that a country may be doing well in FP and not in MH, or 77 coverage is good and IFA consumption is low. It is more useful to llok at the indicators across the columns to see if there is a problem in this area. It must be stressed that this is only to be used as a filter, more through analysis is needed for quality project design.

TABLE 4.2
RISK ASSESSMENT TOOL FOR MATERNAL AND NEONATAL HEALTH

PROBLEM NEED	DATA	VERY POOR SETTING	POOR SETTING	MODERATE SETTING	HIGH SETTING	VERY HIGH SETTING
	Environment					
Inadequate/unsupportive policies	Policy	SM policy passed in the last year	SM policy passed in the last 2 years	SM policy passed in the last 3 years	SM policy passed in the last 4 years	SM policy passed in the last 5 years of more
Low Women's Status Limited education	(% of female literacy)	Less than 20%	21% - 35%	36% - 50%	51% - 65%	More than 65%
Limited access to resources reducing access to care	Access to resources	No access to resources	Limited access to resources	Some access to resources		Access to resources
Limited participation in decision-making inhibiting seeking and obtaining care	Women's participation in decision-making	No decision-making	Limited participation decision-making	Some participation decision-making	Some independent decision-making	Independent decision-making
Limited mobility hindering access to care	Mobility	Isolated	Mobile with male relatives only	Mobile with others	Mobile with permission	Mobile alone
	Infrastructure					
Poor access	Average distance/time to health source	More than 12 kms	11 - 8 km	7 - 5 km	4 - 2 km	Less than 1 lm
Poor access	Doctors per 10,000 population (All)	1 - 5	6 - 15	16 - 30	31 - 45	More than 45
Poor access	Number of health facilities per 500,000 that provide B-EOC/C-EOC	1 None	2 1	3 1	4 1 - 2	5 or more More than 2
	Health Status					
Poor access to quality MH services	Maternal Mortality Ratio	More than 650	649 - 500	499 - 350	349 - 200	Less than 200
Poor access to quality MH services, newborn care	Infant Mortality Rate	More than 100	99 - 80	79 - 65	64 - 50	Less than 50
Poor access to quality FP services	Total Fertility Rate	More than 6	5.9 - 5.0	4.9 - 4.0	3.9 - 3.0	Less than 3

Source: Adapted from the World Bank, Tinker, 1993; Prepared by Susan Rae Ross, CARE RTA, Nov., 1998; SM = Safe Motherhood
Note: this table is still in draft format and will continue to be tested in the next year.

TABLE 4.2 (cont.)
RISK ASSESSMENT TOOL FOR MATERNAL AND NEONATAL HEALTH

PROBLEM NEED	DATA	VERY POOR SETTING	POOR SETTING	MODERATE SETTING	HIGH SETTING	VERY HIGH SETTING
	Health Infrastructure					
Poor access to MH services	% of women that attend at at least 3 antenatal care visits	Less than 20%	21% - 35%	36% - 50%	51% - 65%	More than 65%
Preference, poor perception or poor access to MH	% Home births	More than 60%	60% - 45%	44% - 30%	29% - 15%	Less than 15%
Inadequate number of trained staff, deployment and access to competently trained providers	% of women who have a skilled provider attend their birth	Less than 20%	21% - 35%	36% - 50%	51% - 65%	More than 65%
Poor access	% of overall institutional deliveries	Less than 20%	21% - 35%	36% - 50%	51% - 65%	More than 65%
Beliefs, access to and quality of MH services	% of women with complications that deliver in an institution (met obstetric need)	Less than 3%	4% - 6%	7% - 10%	11% - 13%	More than 13%
Poor access	% of women who receive a post-partum visit in the first 24 hours	Less than 20%	21% - 25%	36% - 50%	51% - 65%	More than 65%
Poor access and distribution	% women who receive PP Vitamin A supplementation	Less than 20%	2% - 35%	36% - 50%	51% - 65%	More than 65%
Misinformation, poor access to and quality of FP services	Contraceptive prevalence rate of modern methods	Less than 10%	15% - 25%	26% - 35%	36% - 45%	More than 45%
Poor access to and quality of FP services	Unmet need for FP both limiting/spacing	More than 30%	30% - 25%	24% - 20%	19% - 15%	Less than 15%
Inadequate nutrition, poor access to health services and distribution of systems	% pregnant anemic women	More than 60%	60% - 45%	44% - 30%	29% - 15%	Less than 15%
Poor access to identification and treatment services	Syphilis prevalence among antenatal women	More than 9%	Between 9% - 7%	Between 6% - 4%	Between 3% - 1%	Less than 1%

Source: Adapted from the World Bank, Tinker, 1993; Prepared by Susan Rae Ross, CARE RTA, Nov., 1998
Note: this table is still in draft format and will continue to be tested in the next year.

TABLE 4.2 (cont.)
RISK ASSESSMENT TOOL FOR MATERNAL AND NEONATAL HEALTH

PROBLEM NEED	DATA	VERY POOR SETTING	POOR SETTING	MODERATE SETTING	HIGH SETTING	VERY HIGH SETTING
	Neonatal Health Status					
Poor access and distribution	% of TT coverage	Less than 25%	26% - 40%	41% - 55%	56% - 70%	More than 70%
Poor access to quality maternal and newborn services	Neonatal deaths as a proportion of IMR	More than 50%	49% - 40%	39% - 30%	29% - 20%	Less than 20%
Poor maternal nutrition	% of LBW	More than 40%	39% - 30%	29% - 20%	19% - 10%	Less than 10%
	IE&C					
Poor education levels, health education, and counseling	% of women who know of a FP source	Less than 20%	21% - 35%	36% - 50%	51% - 75%	More than 75%
Poor education levels, health education, and counseling	% of couples with birth plans	Less than 5%	6% - 15%	16% - 25%	26% - 40%	More than 40%
Poor education levels, health education, and counseling	% of women who know danger signs	Less than 20%	21% - 35%	36% - 50%	51% - 75%	More than 75%
Poor education levels, health education, and counseling	% of caretakers who know a source for newborn care	Less than 20%	21% - 35%	36% - 50%	51% - 75%	More than 75%

Source: Adapted from the World Bank, Tinker, 1993; Prepared by Susan Rae Ross, CARE RTA, Nov., 1998
Note: this table is still in draft format and will continue to be tested in the next year.

III. PROGRAM DESIGN CONSIDERATIONS

Once the data have been collected and analyzed, then managers can begin the process of designing their programs, including selection and prioritization of interventions, formulation of a monitoring and evaluation plan, and implementation of project strategies and activities.

Evaluation of successes in low-income countries such as Sri Lanka, Kerala State in India, Malaysia, Cuba and China has shown that interventions implemented to reduce maternal mortality were:

- improved access to basic health services and nutrition before, during and after childbirth (including family planning);
- attendance at birth by skilled professional providers (midwives, nurses, doctors);
- access to essential obstetric care when complications arise; and
- policies that raise women's social and economic status and their access to property and other resources[98].

In these countries, the toll of maternal mortality and morbidity was reduced through the synergistic effect of combined interventions. In 1990, MMR in Sri Lanka was 30 per 100,000 live births, while Ivory Coast was 830 per 100,000 live births, but both countries had a gross national product (GNP) of about U.S. $700[98].

We hypothesize that as countries evolve (e.g., communications, infrastructure, capacity of health institutions, education of women, mobility of women, and overall health status) so do the types of interventions that they can implement. This section attempts to establish linkages between the maternal health settings described in Table 4.2 and the most effective interventions. **The process described below is aimed towards assisting program managers in prioritizing the key interventions that can be undertaken and the identification of key areas where strategic alliances are required.**

Note: While we are still learning, we believe that the level of general and health infrastructure, which is also usually reflected in the health status, influences the interventions and maternal health programs that can be undertaken. Although this has been discussed in the literature, it is still at the hypothesis level. We encourage and highly support experimentation and adaptation of this approach.

In this manual, we are promoting the concept of essential obstetric services which includes comprehensive antenatal care, management of complications, and post-partum care as opposed to emergency obstetric care which usually only refers to appropriate management of complications. Also, in this manual, "skilled providers" refers to professional health staff (physicians, nurses, and midwives) with adequate training in life-saving skills. This does not include trained TBAs, however, this does not mean that TBAs cannot play a role in promoting maternal and newborn health.

A. *Very Poor Maternal Health Setting*

In areas where the maternal health setting is very poor, women's status is very low with high rates of illiteracy, restricted mobility, limited, if any, participation of women in household decision-making processes or access to resources. These areas have very high fertility, with rates greater than six, low contraceptive prevalence (CPR: less than 10%), high maternal deaths with MMRs of 650 or greater, and less than 20 percent of births are assisted by a trained provider.

These settings, due to their lack of general and health infrastructure, trained personnel, functioning health systems, and supportive health policies, need to focus on **EXPANDING ACCESS** to all health services, including family planning, maternal health and children's health. This does not mean that quality is not important, but in many of these settings the services are not available due to distance and lack of staff, drugs, and equipment. The main interventions are basic training on health services and beginning management information and logistics systems.

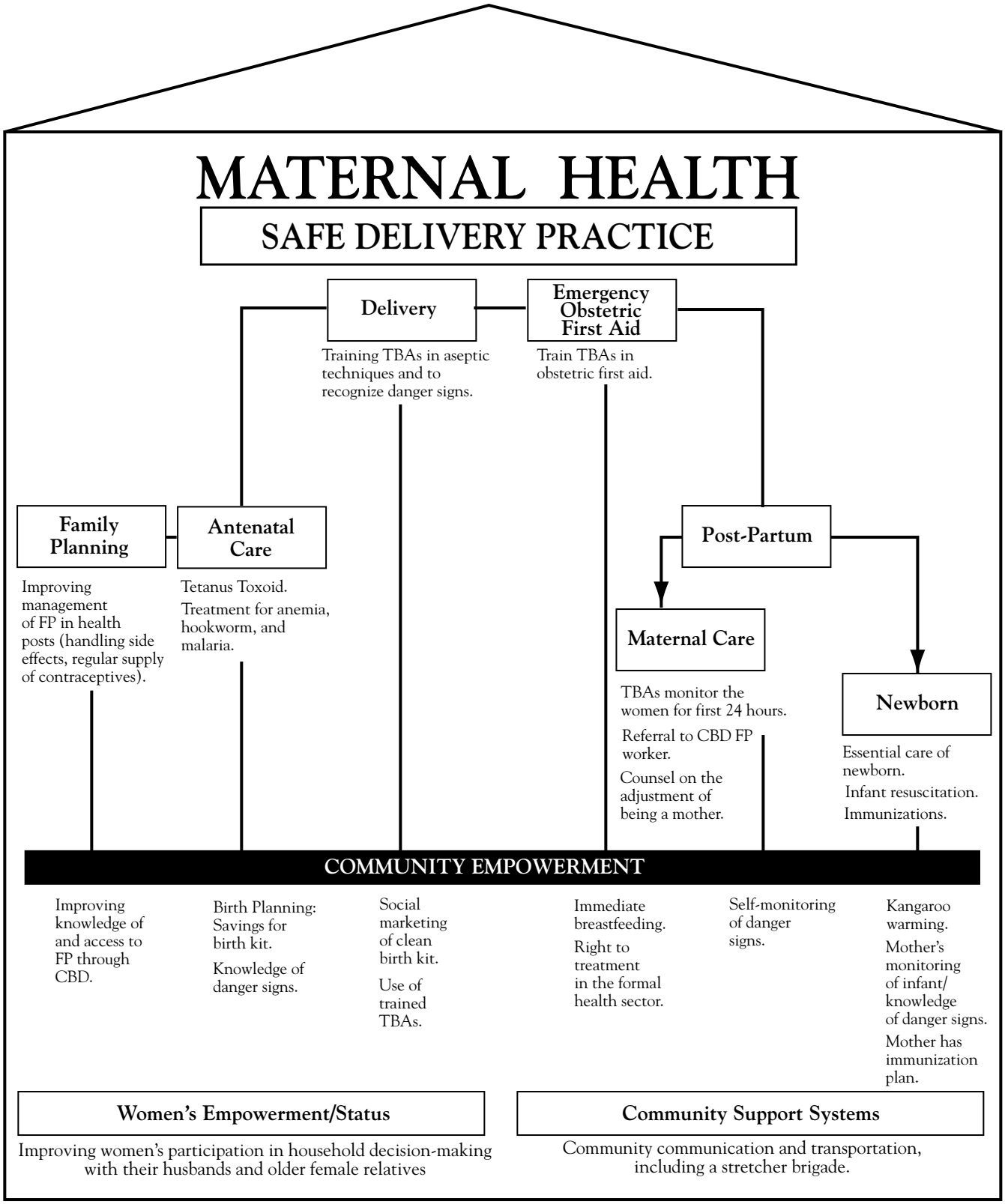
Some interventions that have had a significant impact on reducing maternal and neonatal deaths in these settings include:

- increasing access to TT vaccination, treatment of anemia and malaria through antenatal care;
- improving access to quality FP services, especially outreach services/community-based distribution and counseling on what FP is and what methods are available;
- supporting child survival interventions (breastfeeding, immunization) to reduce infant mortality and encourage birth spacing;
- training of TBAs and midwives, particularly on the "six cleans";
- encouraging essential newborn care;
- encouraging the use of materials (or purchase of a clean birth kit) for a clean birth; and
- providing or facilitating health education and communication strategies to educate women and their families on all the above topics.

Figure 4.2 depicts CARE Mozambique's Maternal Health Program. It was developed after a thorough environmental assessment of the local needs and CARE's strengths. It is drawn in a linear way to reflect the main thrust of the program.

The primary focus of the project is to enhance safe delivery practices with the practicing TBAs. (Note: delivery and emergency obstetric first aid are the highest priority.) The second priority is to enhance access to FP services (which is also supplemented by another CARE reproductive project in the area), as well as, strengthening antenatal care and post-partum services. A fundamental foundation of the project is community mobilization, particularly empowering women, through the activities listed below the solid bar.

FIGURE 4.2
CARE MOZAMBIQUE'S PROGRAMMING FRAMEWORK



B. Poor Maternal Health Setting

In areas where the maternal health situation is poor, women's status is low, but there may have been some progress. Still, many women are illiterate, have restricted mobility, and limited, if any, participation of women in household decision-making processes or access to resources. These areas have high fertility, with rates between five and six, low contraceptive prevalence (CPR: less than 25%), high maternal deaths with MMRs of 550 to 650, and less than 35 percent of births are assisted by a skilled provider.

These settings, due to some advancements in infrastructure, need to focus on **continuing to EXPAND ACCESS while beginning to address QUALITY of SERVICES.** The basic services that have been established still need to expand their reach while consolidating the quality of the services provided. Interventions may include strengthening counseling skills, expanding the number of trained staff, and enhancing all the interventions previously stated under the Very Poor Maternal Health Setting. Interventions that have had a significant impact on reducing maternal and neonatal deaths in these settings include:

- increasing access to antenatal care, including information about complications, if services are available, and birth planning;
- increasing access to quality FP services, including training on clinical methods, counseling on choice of methods, side effects, and rumors;
- developing appropriate curriculums for life-saving skills training;
- supporting child survival interventions (management of ALRI and diarrhea) outreach services to reduce infant mortality, introduction of IMCI, and encourage birth spacing;
- training TBAs and midwives, particularly on appropriate obstetric first aid measures; and
- providing or facilitating health education and communication strategies to educate women and their families on all the above topics.

C. Moderate Maternal Health Setting

In these settings, the status of women is somewhat better with illiteracy about 50 percent; they enjoy some mobility, participate in some household decision-making, and they have some access to resources. Women are beginning to control their fertility with TFRs between four to five and use of modern FP methods is between 26 - 35 (CPR) percent. However, there is still a significant unmet need for FP services (25%). These areas have somewhat lower MMRs, ranging from 500 - 300 and IMRs between 80 - 65.

In these settings, there are other underlying factors that may need to be addressed in order to continue to reduce maternal mortality. These may be more difficult socio-economic or cultural conditions such as early marriage, girls'/women's education, nutrition, harmful practices such as FGM, unsafe abortion or systematic issues such as lack of medicines and trained personnel. If these critical factors are not addressed, progress will be unlikely.

Due to advancements in general infrastructure and investments in the health sector resulting in greater availability of health services, these settings need to focus on **IMPROVING QUALITY** of all health services. There will still be underserved and/or hard-to-reach populations where access will be a problem, but for the majority of the population quality is the main issue. Interventions to emphasize include enhancing counseling skills, focusing on client satisfaction, strengthening the MIS system, utilizing the data for decision-making purposes, and improving both basic and comprehensive obstetric care. New services may be able to be decentralized to lower levels of the health system (e.g., health center) including; screening pregnant women for syphilis and treatment of sick newborns. Another main concern for this setting is the cost of services and ways to generate or recover some funds. Interventions to consider may include:

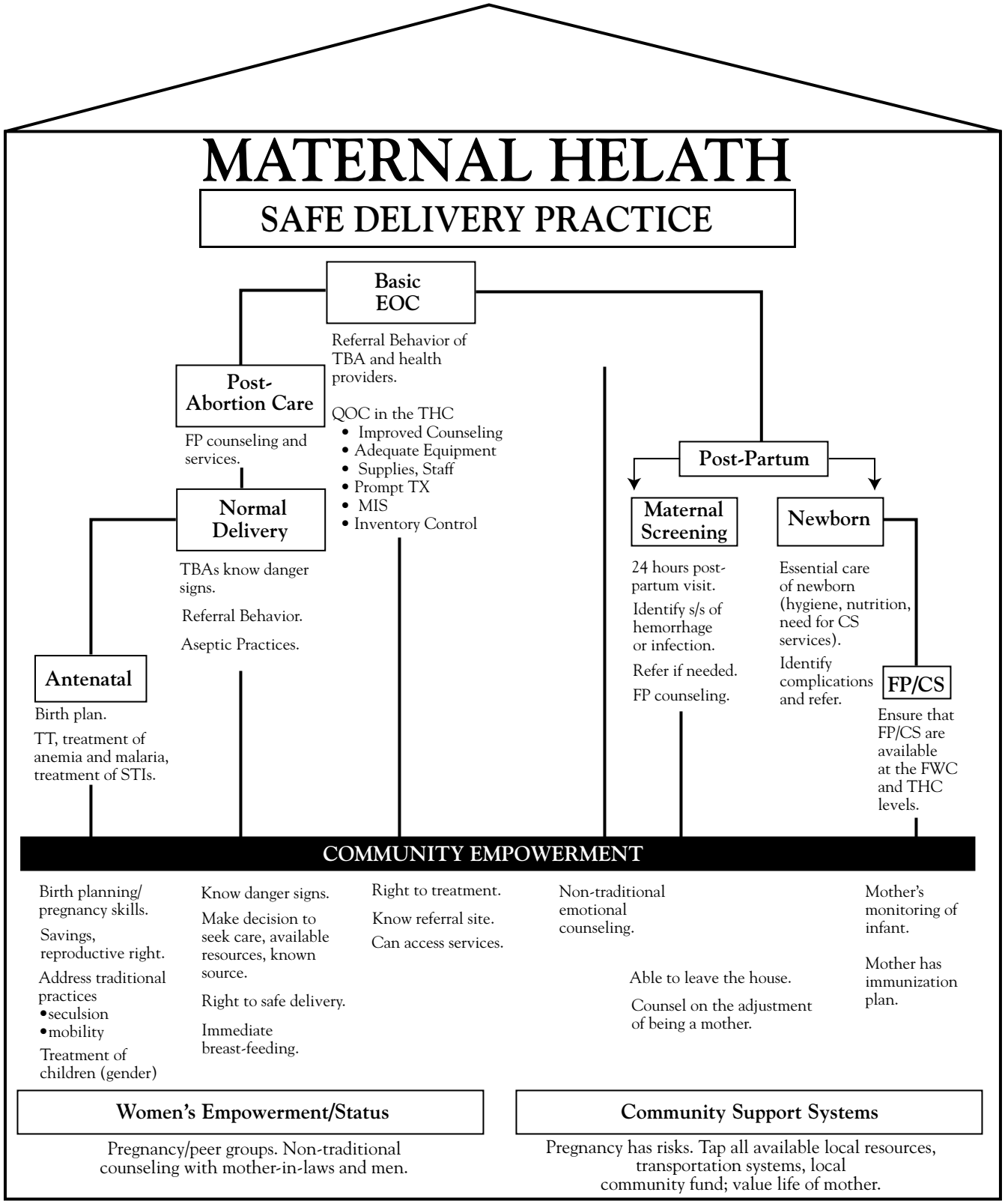
- establishing and strengthening facilities to provide quality basic/comprehensive obstetric services on a regular basis (medicines, equipment and personnel);
- addressing key issues of women's status/empowerment;
- working with communities to address transportation and financial barriers to accessing services;
- improving access to post-partum and newborn care;
- improving management of the sick newborn in the community and institutions;
- improving management information, logistics and inventory control systems;
- creating and promoting cost-recovery approaches; and
- training midwives and physicians, particularly on life-saving skills; and providing health education and communication strategies to educate women and their families on all the above areas.

Figure 4.3 portrays CARE/Bangladesh's maternal health program. The program was developed after:

1. a thorough environmental assessment;
2. comprehensive review of qualitative and quantitative secondary data available in Bangladesh; and
3. a participatory rural appraisal in the project area was conduted and analyzed.

As a result of this process, CARE/Bangladesh decided to focus on strengthening the ability of the Thana Health Complex (THC) to provide quality basic EOC services, particularly enhancing the referral system. At the same time, the project is heavily directed towards working with the community (household decision-makers, women, community leaders) to develop systems to improve access to these services as well as to understand the magnitude of the problem. Therefore, EOC and post-abortion care are the primary focus of the project reflected by the height of the bar in Figure 4.3, followed in descending order of priority by post-partum care, normal delivery, antenatal care and post-partum FP and child survival.

FIGURE 4.3
CARE BANGLADESH'S PROGRAMMING FRAMEWORK



D. High Maternal Health Setting

In high maternal health settings, there have been improvements in women's status as demonstrated by low rates of illiteracy (40% or less), unrestricted mobility, participation of women in decision-making, and women's access to resources. With fertility rates at four or below, and CPR rates greater than 35 percent, women are generally able to determine the number of children they will bear and when. There may still be an unmet demand for FP services (less than 20%), but in general the services are accessible. These countries have MMRs less than 300 and IMRs less than 65.

Since these areas have a well developed health infrastructure, it is more a question of maintaining the successful programs and identifying critical elements that still need to be addressed to reduce maternal mortality; such as unsafe abortion or adolescent pregnancies. These programs need to focus on **Programmatic, Technical, Institutional and Financial SUSTAINABILITY** of health services. Some interventions to be considered are:

- targeting underserved groups;
- decentralizing services to lower level health care facilities;
  - → HIV counseling and testing at health centers;
  - → screening for syphilis among pregnant women at health post health centers;
  - → screening for anemia with hemocrit at the health centers; and
- working with communities to address financial barriers to CARE (e.g., insurance schemes).

E. Very High Maternal Health Setting

In very high settings, there have been great strides in women's status and health care is viewed as a right. With fertility rates at three percent or below, and CPR rates greater than 45 percent, women are generally able to determine the number of children they will bear and when. There may still be an unmet demand for FP services (less than 15%), but in general the services are accessible. These countries have MMRs less than 200 and IMRs less than 50.

The challenge for very high resource settings is to ensure that: 1) women and their families are educated about the various interventions described above; and 2) quality services are accessible and affordable to promote and sustain behavior change.

Table 4.3 tries to present a summary of interventions that could be undertaken in the various maternal health settings. This **DRAFT** table is only included to give program managers some ideas of what interventions may work well in their settings. Each intervention is different and may require more infrastructures and supplies to be carried out than others, so they may be more difficult to implement initially. Much more work needs to be done on this concept.

TABLE 4.3
DRAFT EXAMPLES OF INTERVENTIONS BY SETTING

	VERY POOR	POOR	MODERATE	HIGH	VERY HIGH
PRECONCEPTION	Community-based Family Planning	Clinical Family Planning (IUD, Depo-Provera).	Focus on quality of clinical and CBD methods.	Expand the health workers that can provide FP services.	
	Counseling on different FP methods.	Counseling on side effects and overcoming rumors.	Involve other providers (e.g., pharmacists).	Cost recovery systems in place.	
			Male involvement.	Begin insurance schemes	
		Begin programs to supplement nutrition of adolescent girls where that is a problem.			
		Begin discussions about age of marriage.	Begin discussions about legal rights and inheritance.		
			Introduce other FP methods (NORPLANT).		
ANTENATAL CARE AT HEALTH POST LEVEL	TT, IFA, Malaria	Information on danger signs if services are available.	Screening and TX for STIs. Syndromic approach.	STI screening and Treatment (RPR). Lab testing.	HIV counseling/ testing
		Birth planning. Encourage the presence of a skilled provider at birth.		women.	AZT treatment for HIV-infected pregnant
		Involve other family members in communi-cation strategies.			
COMMUNITY CHILDBIRTH	Train TBAs and community members on the "six cleans."	Training on obstetric first aid. Build rapport between TBAs and formal health sturcture.		Build rapport between TBAs and formal health structure.	
	Encourage the development of birth kits.	Distribute birth kits.	Socially market birth kits.		
		Transportation systems.	Emergency loan programs.		

Note: This is NOT a comprehensive list, but is meant to provide a guide for program managers.

TABLE 4.3 (cont.)
DRAFT EXAMPLES OF INTERVENTIONS BY SETTING

	VERY POOR	POOR	MODERATE	HIGH	VERY HIGH
INSTITUTIONAL CHILDBIRTH		Develop appropriate policies and protocols.	Expand the health care cadres that can provide life-saving skills.	Enhance curriculum so that life-saving skills are included in pre-service training.	
		Upgrade health facilities to provide EOC at the district hospital level.	Upgrade health facilities to provide EOC at the health center level.		
POST-PARTUM	Importance of monitoring women during the post-partum period.	Train midwives and doctors on life-saving skills if infrastructure is available.	Work with the community to refer post-partum women to health facilities.	Ensure PP Vitamin A supplementation.	
		Train health providers on post-partum services.	Ensure adequate stay (24 hours) in institutions.	Promote rooming-in.	
		Training community workers on danger signs.	Training families on danger signs.		
NEWBORN	Increase TT coverage and use of clean blade.	Expand practice to include the six cleans and essential newborn care.	Train health workers on appropriate management of the sick newborns.	Tracking of LBW babies. Introduction of IMCI for newborns.	

Note: This is NOT a comprehensive list, but is meant to provide a guide for program managers.

IV. MONITORING

It is difficult to measure maternal mortality because the number of maternal deaths in a year is relatively small, making it difficult to determine whether fluctuations in mortality are due to program interventions or chance. In addition, large sample sizes are needed to detect these changes. Therefore, for most programs, measuring maternal mortality or morbidity (impact indicators) is neither feasible nor desirable.

"Process" (program activities) and "Output" (results of those activities) indicators can measure changes in the steps leading to the outcome on an annual basis. Program outcome level indicators have a strong association with impact indicators and can be measured every two to three years. Impact indicators provide information on the end result, but they don't provide insight into how the outcome was achieved, which output indicators reflect. If this information is not available, programmers may continue to support less effective interventions[8, 53].

TABLE 4.4
KEY FEATURES OF PROGRAM DESIGN, MONITORING, AND EVALUATION

- ➔ Use of existing data for assessment and baselines (when feasible).
- ➔ Integration of program design and evaluation (other reproductive health interventions).
- ➔ Use of process and output indicators to monitor progress based on service utilization.
- ➔ Collection of cost data.
- ➔ Use of qualitative and quantitative methods.
- ➔ Regular program review.

Source: Maine, 1998.

In order to evaluate programs, we need to understand the "causal chain" linking program activities to maternal deaths. There are several conditions that must exist before a maternal death can occur:

1. the woman must become pregnant;
2. she must develop an obstetrical complication; and
3. there must be inadequate treatment of the complications which may be due to a combination of delays in deciding to seek care, reaching the facility, receiving care at the health facility or mismanagement at the health facility.[51]

For most programs, measuring maternal mortality or morbidity (impact indicators) is neither feasible nor desirable.

CARE uses the Monitoring and Evaluation Framework presented in Table 4.5. As stated previously, it is unrealistic to expect that the maternal mortality ratio or rate can serve as a feasible indicator for most programs. However, many programs may be able to monitor changes in outcome levels or behavior change over several years, and all programs should be able to monitor changes at the output and process level.

TABLE 4.5
CARE MONITORING AND EVALUATION FRAMEWORK

LEVELS OF EVALUATION	ILLUSTRATIVE INDICATORS
Impact (functional change)	Maternal Mortality Ratio
Effect (behavioral or systems change) skills	% of women with complications who deliver in a facility % of providers technically competent to provide life-saving skills
Output (knowledge change)	% of women who know at least one danger sign % of providers who know the basic counseling principals
Process (project activities)	# of women counseled # providers trained
Inputs	Funds, staff, supplies, materials

As stated previously, the timing of activities is also important and there needs to be a balance between community mobilization (demand generation) and strengthening of the health facility and personnel to ensure that quality services are available. Program monitoring can use a combination of process and output indicators to track the progress of the selected interventions on a monthly or quarterly basis. The references for monitoring and evaluating maternal health programs are presented below.

BEST REFERENCES

UNICEF/WHO (1996) **Maternal Mortality: Guidelines for Monitoring Progress.** Published by UNICEF.

Maine, D. et al (1998) **The Design and Evaluation of Maternal Health Programs.** Published by UNDP.

WAYS TO OBTAIN MATERNAL HEALTH INFORMATION

Verbal Autopsies (maternal and neonatal) are used to obtain information about maternal and/or newborn deaths that occur at home. It can be used to help determine the medical as well as the non-medical aspects of maternal and/or newborn deaths. It can also be conducted at the hospital level to assess administrative systems and management of the complications.

Antenatal Records can cover all pregnancies of a woman and is an invaluable instrument in improving health information. It can provide information on a woman's history, complications that she may have experienced and treatment provided. It may also be used to track pregnancy outcome and maternal complications.

Labor/Delivery Ward Book is an important document for evaluating the quality of obstetric care. It can provide a comprehensive review of the medical management of all pregnant women which is key to assessing quality of care. The Ward Book may also be used for calculating the perinatal mortality rate at the health institution.

Case Reviews provide a forum to review all aspects of maternal and newborn deaths. Cases are selected and critiqued to assess any delays in care or mismanagement of complications that contributed to the death. In order for this to be effective, the review needs to be done in a non-judgmental environment where a team of providers is willing to learn from their experiences and incorporate new behaviors into their practice. It is often useful to also examine "near misses," which are women/newborns who survived but were very close to death, as well as mortalities[98].

Table 4.6 shows an illustrative list of indicators that can be selected based on the interventions chosen[8, 53].

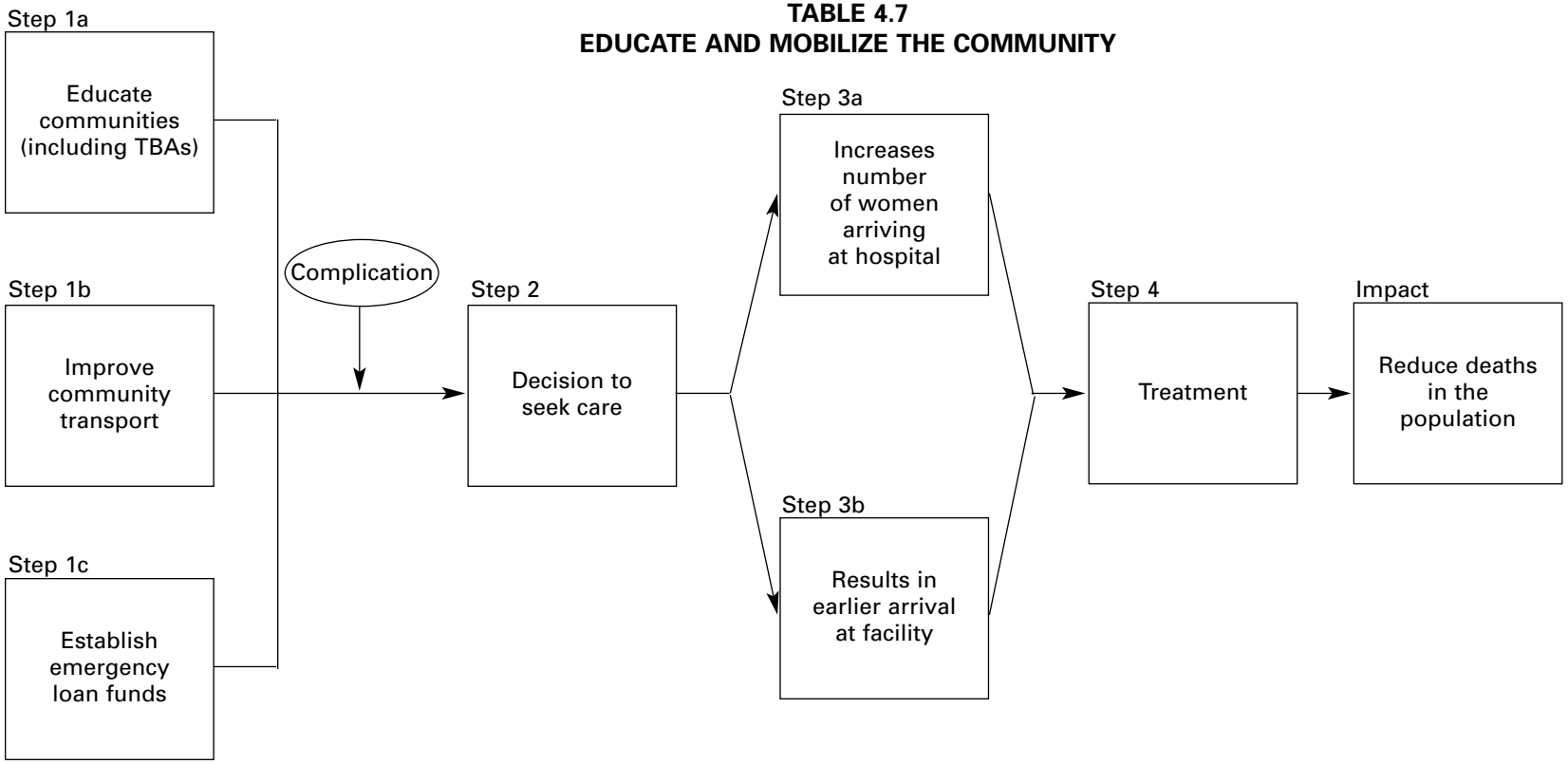
Tables 4.7, 4.8, and 4.9 provide illustrative examples of interventions that might be selected and their corresponding indicators. The monitoring plans should be kept as simple as possible. **Programs need to decide what pieces of information are required and only collect data that will be useful for assessing progress and program planning.** The overall objective of data collection is to use the data, at the lowest level, for decision-making to improve the program[8, 53].

TABLE 4.6
ILLUSTRATIVE LIST OF INDICATORS

INDICATOR	DATA SOURCE	LEVEL OF INDICATOR
% of pregnant women that receive ANC (1,2,3 visits).	Service Records	Effect
% of pregnant women that receive 2 Tetanus vaccines.	Service Records	Effect
% of pregnant women that receive iron tablets.	Service Records	Effect
% of pregnant women that receive FP counseling during ANC visits.	Service Records/Survey	Effect
% of pregnant women that have a birth plan.	Survey	Effect
% of pregnant women that know at least 2 danger signs.	Survey/FGD	Output
% of husbands or in-laws that know at least 2 danger signs.	Survey/FGD	Output
% of TBAs that know at least 5 danger signs.	Post-test	Output
% of pregnant women and families that know how to get to the nearest health facility if a complication arises.	Survey	Output
% of pregnant women that deliver at home with a trained attendant.	Service Records/Survey	Output
% of pregnant women that deliver at home using a clean birth kit/materials.	Service Records/Survey	Output
% of pregnant women who have complications that deliver in the facility.	Service Records	Effect
% of providers that have adequate knowledge on how to manage complications.	Post-test Scores	Output
# of facilities that are equipped to provide basic obstetric care.	Facility Records	Output
# of facilities that are equipped to provide comprehensive obstetric care.	Facility Records	Output
# of facilities that have at least one month of supplies to treat obstetrical complications on a regular basis.	Inventory Records	Input
case fatality rates (% of pregnant women with complications that die compared to the total number of cases).	Service Records/ Case Reviews	Effect
% of TBAs that know the 5 elements of good newborn care.	Post-test	Output
% of women who begin breast-feeding within the first hour.	Service Records/Survey	Effect
% of pregnant women and their families that know at least 2 danger signs for newborns.	Survey	Output
% of women that are visited by a trained attendant in the first 48 hours.	Survey	Effect
% of women that receive post-partum FP services.	Survey	Effect

Source: Maine, The Design and Evaluation of Maternal Health Programs, 1998; UNICEF Maternal Mortality Guidelines, 1996

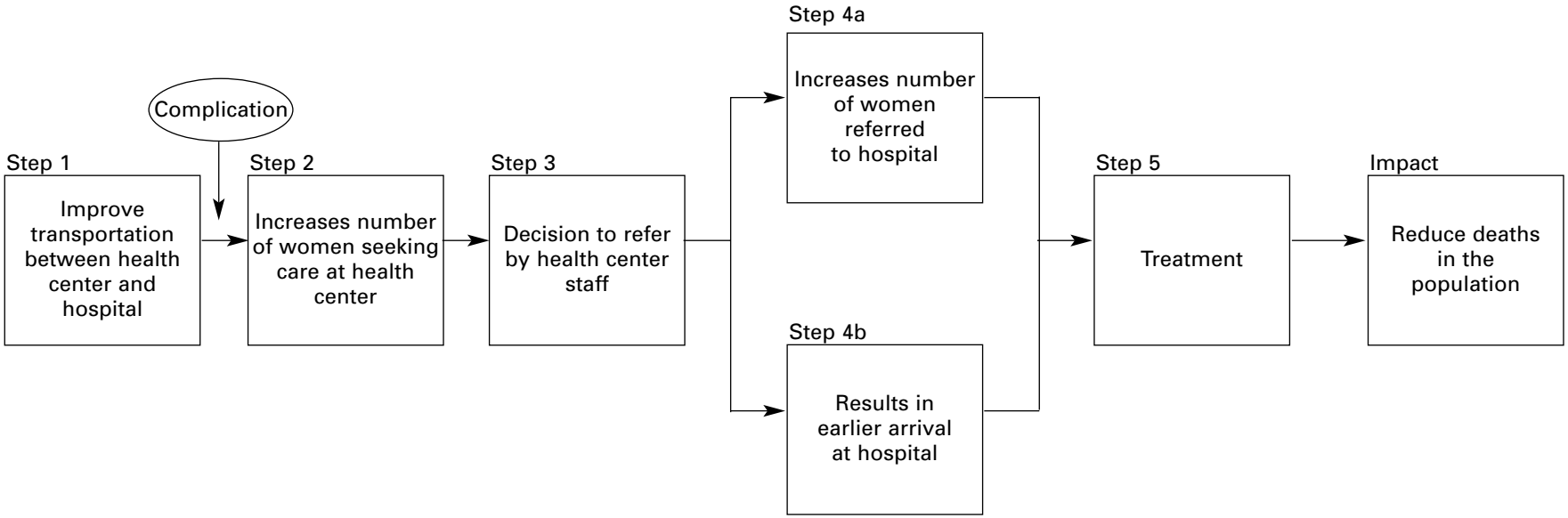
TABLE 4.7
EDUCATE AND MOBILIZE THE COMMUNITY



STEP	PROCESS/OUTPUT INDICATORS	DATA SOURCES
1a	Number of sessions held; number of people educated Knowledge of danger signs of complications	Project staff reports; attendance lists Pre- and post-tests/mini-surveys
1b	Availability of community transport Utilization of community transport	Village leader interviews; project staff reports Patient interviews; transport records
1c	Availability of emergency loans Utilization of emergency loans	Village leader interviews; project staff reports Village leader interviews; fund records
2	Decision to seek care	Community focus groups; mini-surveys
3a	Number of women with complications arriving at facility	Health facility data
3b	Condition on arrival	Health facility data
4	Case fatality rate	Hospital data

Source: Maine, 1997

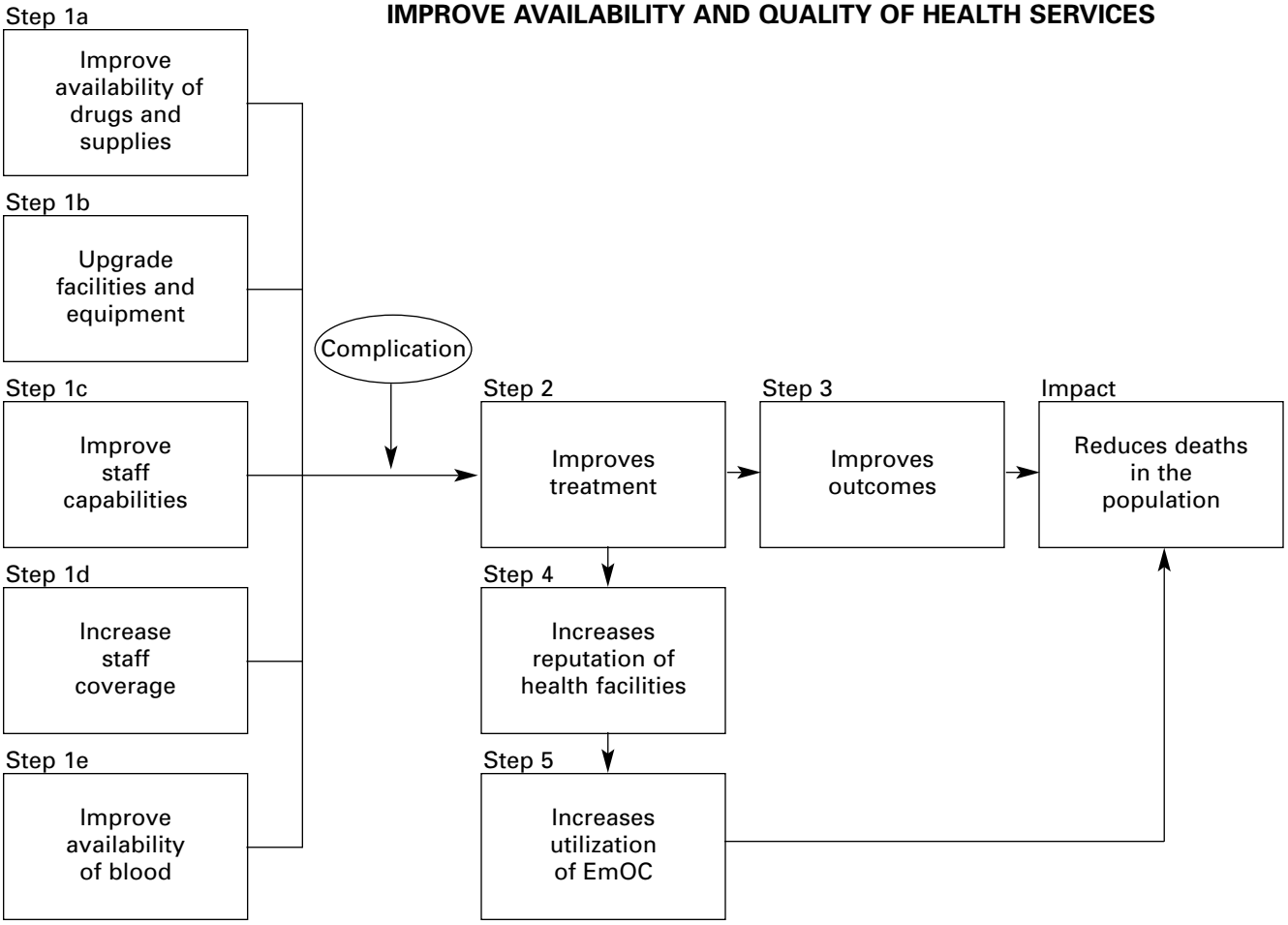
TABLE 4.8
IMPROVE TRANSPORTATION BETWEEN THE HEALTH CENTER AND HOSPITAL



STEP	PROCESS/OUTPUT INDICATORS	DATA SOURCES
1	Availability of transport Utilization of transport	Checklist data; project staff reports Transport vehicle log; interviews with community and leaders
2	Number of women with complications arriving at health center	Health center data
3	Decision to refer	Interviews with health center staff; health center data
4a	Number of completed referrals	Health center and hospital data
4b	Condition on arrival Time from referral to arrival at hospital	Case reviews; health center and hospital data; vehicle log Hospital data
5	Case fatality rate	Hospital data

Source: Maine, 1997

TABLE 4.9
IMPROVE AVAILABILITY AND QUALITY OF HEALTH SERVICES



STEP	PROCESS/OUTPUT INDICATORS	DATA SOURCES
1a	Availability of drugs and supplies Utilization of drugs and supplies	Checklist data Health facility data
1b	Availability of upgraded EmOC facilities/equipment Utilization of upgraded EmOC facilities/equipment	Project staff reports; staff interviews Health facility data
1c	Number of staff trained Improved staff capabilities	Project staff reports Pre- and post-tests; case reviews
1d	Proportion of hours per week with skilled person on call Proportion of hours per week with skilled person on site	Staff schedule; project staff reports Staff schedule; project staff reports
1e	Availability of blood Utilization of blood	Checklist data Blood bank log
2	Time from arrival to definitive treatment Number of C-sections (or other procedures) performed	Case reviews; time-motion studies Operating theater log
3	Case fatality rate	Health facility data
4	Reputation of health system in community	Pre- and post-tests; mini-surveys
5	Number of women with complications admitted to facility	Health facility data

Source: Maine, 1997

V. EVALUATION

How do you know success when you see it? Programs can measure outcome level indicators through baselines, mid-term evaluations and final evaluations. Although the strategic framework presented in Table 4.10 is not quantitative, it will be useful in guiding our program designs and implementation strategies. For each project, quantitative indicators can be added to the interventions selected for that setting.

Our goal is to:

1. select appropriate interventions reflective of the local needs;
2. build on lessons learned from other countries;
3. implement them according to current best practices; and
4. monitor their progress.

We are striving to influence changes in the behaviors of individual women, household decisionmakers, communities, health workers, and systems with which we work. We hope that by doing the activities present above we will see significant changes in our strategic framework presented in Table 4.10.

VI. CONCLUSION

This Chapter has attempted to provide a framework to undertake an assessment of the local maternal health setting, so that a strategic approach can be utilized in data collection, analysis, and selection of effective interventions. It also discussed the influence that different settings may have on the selection of various interventions.

As stated in the introduction, design, monitoring, and evaluation were included in the same chapter to encourage the development of monitoring and evaluation plans during the design phase. While there is little consensus on the best indicators to use for monitoring maternal health programs, some options were provided that can be adapted to the local needs of a specific setting. Lastly, CARE has shared its strategic framework for maternal health programming. Although it is not quantitative, we believe that it can be used to guide our programming over the coming years and help us reach our goal of improving women's lives.

TABLE 4.10
STRATEGIC MATERNAL HEALTH FRAMEWORK FOR 1997-2003

INDIVIDUAL WOMEN

who can make an informed and timely decision independently or have an equal say in the decision-making process about their health.

WOMEN OF REPRODUCTIVE AGE	ANTENATAL	CHILDBIRTH	POST-PARTUM
THE GIRL CHILD Adequate nutrition Educational opportunities **WRA** Maximize the use of beneficial practices and overcome harmful practices to have healthy reproductive lives. Men and women know about menstruation, conception, contraception, ways to prevent/identify/treat STIs, adequate nutrition and hygiene. Can access reproductive health services for FP, Tx of STIs and maternal care. Participation in household decision-making processes.	Plan for a healthy pregnancy; know danger signs; expected date of delivery; know why they should seek care; know where to seek care; how to get care; and how to mobilize resources to pay for care. Attend antenatal services; comply with recommended practices (e.g., TT); secure adequate nutrition; and reduce workload. Choose a skilled provider to attend delivery and organize/purchase materials for a clean delivery. Use home-based maternity records. Know essential elements of newborn care; can identify danger signs of a sick newborn; and know where to seek care.	Access a skilled provider to attend delivery. Encourage skilled provider to use materials for a clean delivery. Know danger signs and can participate/make the decision to access services, transportation and resources, as needed. Immediately begin breast-feeding. **NEWBORNS** Know and act on essential elements of newborn care, can identify danger signs and know where to seek care.	**MOTHER** Self-monitor complications, especially the first 24 hours, and seek services if needed. Use clean/hygienic practices after delivery (e.g., clean sanitary pads). Receptive to a home visit by a health worker or community resource person within the first 24 hours after delivery. Receive PP Vitamin A supplementation in the first month. Secure adequate nutrition and continue exclusive breast-feeding for 6 months. Know about their return to fertility, know about different FP methods available, seek contraception when desired. **NEWBORNS** Can identify danger signs and know where to seek care. Immunizations as soon as possible.

TABLE 4.10 (cont.)
STRATEGIC MATERNAL HEALTH FRAMEWORK FOR 1997-2003

HOUSEHOLDS

are decision-makers, such as husbands or mothers-in-law, who encourage women to seek services to protect their well-being as well as the health of their children.

WOMEN OF REPRODUCTIVE AGE	ANTENATAL	CHILDBIRTH	POST-PARTUM
THE GIRL CHILD Adequate nutrition Educational opportunities **WRA** Maximize the use of beneficial practices and overcome harmful practices to have healthy reproductive lives. Couples discuss choice of number/timing of children and use of FP. Encourage women's and men's access to reproductive health services throughout their lives. Increase support for women to access resources for health care services. Supportive of income generating activities for women.	Encourage women to attend antenatal services, comply with recommended practices (e.g., Tx malaria), reduce workload and secure adequate nutrition. Play an active and positive role in birth planning, including knowledge about danger signs, identify skilled provider, organize/purchase materials for a clean birth, know where to receive care, how to get care, and how to pay for services. Practice saving regularly for health services.	Redistribute household chores, such as child care, fetching water. Inform chosen skilled attendant about the onset of labor and use of clean materials. Know/identify danger signs, encourage woman to be referred, know where to get care and how to mobilize transportation and resources for referral. Encourage immediate breast-feeding. Arrange for a blood donor if needed. **NEWBORN** Know and practice essential elements of newborn care. Can identify danger signs and support referral if needed.	Identify appropriate persons to monitor woman/baby for complications in the first week, especially in the first 24 hours, and take action. Encourage the use of clean/sanitary practices after delivery. Encourage adequate nutrition, reduced workload, exclusive breast-feeding for 6 months. Encourage women/couples to seek post-partum FP services. Encourage women with complications to stay in hospital for 24 hours. Receptive to a home visit by a health worker or community resource person within the first 24 hours after delivery. Encourage PP Vitamin A supplementation in the first month. **NEWBORN** Can identify danger signs and support referral if needed. Support immunizations as soon as possible.

TABLE 4.10 (cont.)
STRATEGIC MATERNAL HEALTH FRAMEWORK FOR 1997-2003

COMMUNITIES

support women's access to reproductive health services by maintaining essential systems such as community-based services or functioning transportation mechanisms while adopting healthy behaviors.

WOMEN OF REPRODUCTIVE AGE

THE GIRL CHILD
Adequate nutrition
Educational opportunities

WRA
Maximize the use of beneficial practices and overcome harmful practices.

Encourage couples to plan the timing and number of children they desire and when they want to use FP.

Serve as active partners in planning and managing community reproductive health services to assure accountability and quality.

Support access through community-based reproductive health services, such as:
✔ antenatal care;
✔ family planning;
✔ child health;
✔ transportation systems;
✔ community waiting huts;
✔ community loan funds;
✔ post-partum care; and
✔ newborn care.

Strengthen community mechanisms to support vulnerable groups such as a adolescents and single women.

ANTENATAL

Provide in-kind and/or logistical support to visiting health workers.

Encourage antenatal women to attend antenatal care, comply with regimens, secure adequate nutrition and reduce workload.

Utilize community workers to identify pregnant women, refer for antenatal care and provide a range of services to pregnant women in the community.

Disseminate information and encourage birth planning – use a skilled provider, six cleans, know about danger signs, know where they need to seek care, and how they can get to the service sites.

CHILDBIRTH

Encourage the use of a skilled provider at delivery who uses clean practices.

Utilize resource persons in the community who can identify danger signs and promptly organize referral.

Encourage/support women to be referred out of the village to the nearest appropriate facility.

Maintain systems to expedite transportation and payment of medical costs.

Support immediate breast-feeding.

OBSTETRIC FIRST AID
Community resource person able to provide obstetric first aid.

NEWBORN
Support essential newborn practices.

Utilize community (resource) person who can identify danger signs for the newborn and can facilitate referral.

Community supports a sick newborn being referred to a health facility.

POST-PARTUM

MOTHER
Support hygienic practices (e.g. bathing, sanitary pads).

Encourage monitoring for the first 24 hours by community workers who can identify danger signs.

Encourage women with complications to stay in the hospital for at least 24 hours.

Encourage women to secure adequate nutrition and exclusive breast-feeding for 6 months.

Support women in seeking FP services and post-partum care.

Support exclusive breastfeeding.

Encourage PP Vitamin A supplementation in first month.

NEWBORN
Community worker who knows danger signs of sick newborn.

Support immunizations as early as possible.

TABLE 4.10 (cont)
STRATEGIC MATERNAL HEALTH FRAMEWORK FOR 1997-2003

INSTITUTIONS

provide reproductive health services to women and men throughout their lives, including health posts, health centers, and district and referral hospitals.

WOMEN OF REPRODUCTIVE AGE

Provision of integrated maternal health services. Provide counseling/health education to women and men throughout their lives on hygiene, menstruation, reproduction, healthy pregnancy, nutrition, danger signs, child care, contraception, ways to prevent/identify/treat STIs, and adequate nutrition.

Provide access to quality reproductive health services for men and women.

Address special needs of adolescent boys and girls and other vulnerable groups.

ANTENATAL

Provide antenatal care (e.g., TT, IFA, malaria, anemia, STIs, pelvic assessments) educating women and their families on the importance of having a skilled provider, the need for a clean delivery, possible complications that may arise during pregnancy, the danger signs to look for, where to go to seek services if these arise, how she will get care and how she will pay for services.

Provide quality services in a women-friendly manner including counseling (e.g., FP, nutrition) and appropriate treatment within a timely manner with female workers.

Maintain adequate records of women's health status, their complications, their treatment referrals, and birth outcomes.

BASIC EOC
Manage mild post-abortion complications, moderate anemia and malaria. Stabilize/refer hypertensive disorder, antenatal hemorrhage, and diabetes.

COMPREHENSIVE EOC
Manage severe anemia, severe post-abortion complications, antepartum hemorrhage, pre-eclampsia/eclampsia, sepsis, rheumatic heart disorders.

CHILDBIRTH

Provide assistance to normal deliveries using aspectic techniques, promoting immediate breastfeeding, and good newborn care.

BASIC EOC
Provide antibiotics, fluids, oxy–toxics or sedatives (IM/IV), manual removal of retained placenta, and management of minimal neonatal complications.

COMPREHENSIVE EOC
Provide basic EOC services, plus malpresentations, assisted delivery, anesthesia, surgery, blood replacement, as well as the ability to resuscitate newborns with emergency medicine, ventilation and incubators.

Establish/support referral system and linkages.

Encourage immediate breastfeeding, if possible.

Maintain adequate records of women with complications, their treatment and referrals.

NEWBORN
Practice essential newborn care.

Weigh, register, and give immunizations.

Resuscitation of newborns if needed.

Management of newborn complications (e.g., asphyxia) and LBW.

POST-PARTUM

MOTHER
Monitor women closely for at least the first 24 hours and arrange for follow-up visit by local health worker.

Provide PP FP services (IUD or VSC in the first 48 hours, or IUD, DMPA, Mini-pill, Norplant at 6 weeks) if desired.

Encourage rooming in and exclusive breastfeeding for 6 months.

Provide PP Vitamin A supplement.

NEWBORN
Weigh, register, and give immunizations.

Educate the mother on good child care, breastfeeding and immunization schedule.

Monitoring progress of LBW babies (e.g., sucking, weight).

Management of newborn infections (e.g., pneumonia, tetanus).

5

INTERVENTIONS AND CURRENT BEST PRACTICES

I. BACKGROUND

Chapters 2 and 3 discussed the factors, both social and medical, that influence maternal and neonatal mortality and morbidity. Chapter 4 described several methods to; assess the local maternal health situation, select the most appropriate interventions, and conceptualize "what" could be done. This Chapter offers approaches to address the "four delays," described in Chapter 1 and presented below, that inhibit women and newborns from accessing and receiving quality maternal health services.

- ➔ ***Delay #1:*** ***Delays in problem recognition;***
- ➔ ***Delay #2:*** ***Delays in deciding to seek care;***
- ➔ ***Delay #3:*** ***Delays in reaching the health facility; and***
- ➔ ***Delay #4:*** ***Delays in receiving treatment at the health facility[14].***

This Chapter describes some principles, which are not exhaustive, of "how" the interventions selected can be effectively implemented, in various settings, to address this complex problem. Interventions need to reflect the main barriers, identified for the local setting, that impede access to maternal health services. **Strategies and interventions will vary depending on the specific context** in terms of levels and causes of mortality and morbidity, general and health infrastructure, economic status, social and traditional practices, health beliefs and practices, and the availability and quality of services.

Chapter 5 is organized by:

1. cross-cutting strategies (Section II);
2. the phases of a woman's lifecycle (women of reproductive age, antenatal, childbirth and post-partum), (Sections III, IV, V VI); and
3. the first seven days of the newborn (Section VII).

Each section has a "Current Best Practices" component, which is based on a review of the current literature and lessons learned from a variety of successful country programs. These practices reflect the best understanding, at the present time, of the most effective interventions, if appropriately applied to the local needs, to contribute to a reduction in maternal and newborn mortality and morbidity. **The "Current Best Practices" will need to be updated as research findings and program results become available.**

There are two approaches to improve maternal and newborn health. One approach focuses more on **"mortality reduction"** and has a subset of interventions that are directed more towards reducing mortality. Interventions for mortality reduction may include; upgrading facilities to better manage obstetric complications, teaching skills for the resuscitation of newborns, and management of the sick newborn.

Emergency obstetrical care focuses on the management of pregnancy-related complications, thereby addressing maternal mortality.

Another approach focuses on **"health promotion."** There is a larger set of interventions that may not directly reduce mortality, but through their health promotion effects, may indirectly reduce maternal illness and deaths. Interventions for health promotion may affect the mother, the newborn, or a combination. Activities that foster health promotion may include: proper nutrition, micronutrient supplementation, tetanus vaccination, screening for and treatment of infectious diseases, encouraging a reduction in workload, and treatment of morbidities such as vesciovaginal fistula and uterine prolapse.

These approaches illustrate the differences between **Emergency Obstetric Care (EmOC)** and **Essential Obstetric Care (EOC)**. Emergency obstetric care services focus on the management of pregnancy-related complications, thereby addressing maternal mortality. In contrast, essential obstetric care includes interventions such as antenatal and post-partum care, as well as appropriate management of complications, thus addressing both **"health promotion"** and **"mortality reduction."** These approaches do not have to be mutually exclusive, but it needs to be understood that the selection of interventions may differ depending on the overall objective. Program planners need to have clear goals, so that appropriate interventions can be selected to achieve their objectives[4,6,8,20]. **We believe that both goals need to be addressed, therefore, this document supports the essential obstetric care approach. We are however cognizant that the relative weight of each goal may vary by setting.**

Maternal mortality and morbidity can be lessened by measures that:

- ➔ reduce the incidence of high risk and unwanted pregnancies through improving access to quality family planning and safe (induced) abortion services;
- ➔ reduce the number and severity of obstetric complications through prepregnancy care, antenatal care (to prevent, identify and promptly treat complications), clean and safe deliveries with skilled providers, and quality post-partum care; and
- ➔ reduce the case fatality rate (CFR) through improving access to quality obstetrical and post-abortion care services [8,31,43,48,53].

Essential obstetric care includes interventions such as antenatal and post-partum care, as well as appropriate management of complications, thus addressing both "health promotion" and "mortality reduction."

Newborn mortality can be lessened by measures that:

- ➔ improve women's health and nutritional status through promotion of good nutrition, delaying the first birth and/or spacing between pregnancies for at least two and preferably three years, and prevention and treatment of infections;
- ➔ reduce perinatal mortality through improved maternal care which includes general nutrition, treatment of micronutrient deficiencies (e.g., anemia), TT vaccination, treatment of malaria, hookworm and STIs, and clean and safe delivery with a skilled provider; and
- ➔ reduce perinatal and neonatal deaths through essential newborn care (e.g., initiation of breathing, cord care, keeping baby warm and dry, eye care), immediate and exclusive breastfeeding, immunizations (e.g., BCG, OPV and Hepatitis B), prompt identification and treatment of pneumonia and diarrhea and other infections (e.g., tetanus, sepsis) in the first week of life[4,9,10].

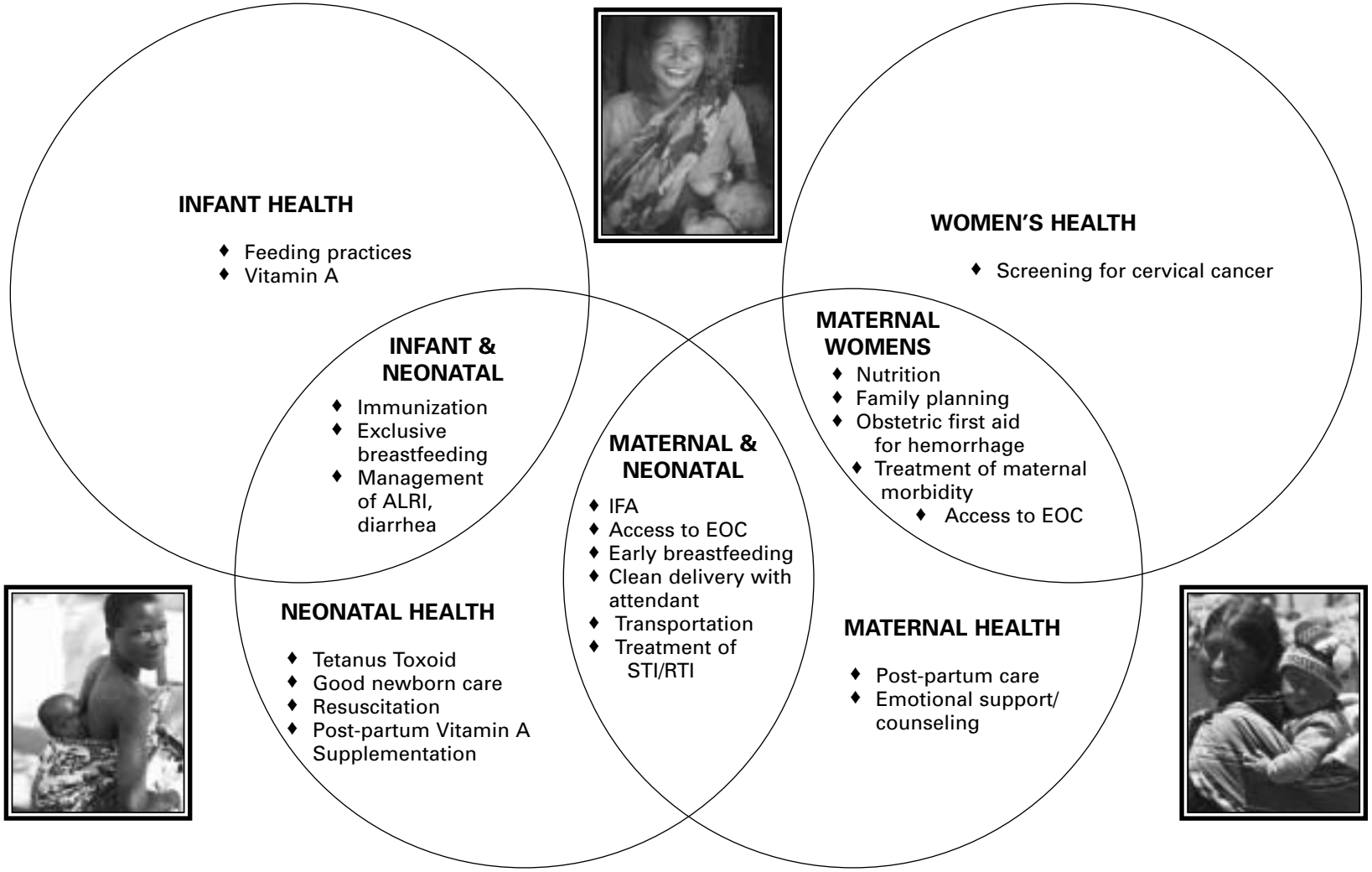
Studies have found that a balanced approach of reducing the distance between women and the health services requires two complimentary strategies: bringing care closer to women and bringing women closer to care[39]. Bringing care closer to women includes outreach services, especially for antenatal care, posting skilled health personnel at the lowest possible level of the health infrastructure (e.g., community midwives) and post-partum care. Bringing women closer to care includes ensuring available and affordable transportation and resources to pay for these services. In some places maternity waiting homes have been used to reduce the distance women have to travel during labor.

Experience has shown that there needs to be a balance between upgrading services and mobilizing the community. If one is done without the other, or if activities are not undertaken in the appropriate sequence, the efforts will not be successful.

The health of the mother and fetus are intertwined. Many of the maternal interventions have positive effects on the mother's health as well as improving newborn outcomes. Many interventions proven to benefit newborns have been given low priority, or even discouraged under the Safe Motherhood Initiative, since they do not predict an obstetric emergency or reduce maternal mortality (e.g., antenatal care). Efforts that improve maternal health such as provisions for IFA, TT, treatment of malaria, hookworm and STIs, and clean delivery should be promoted for the health of both the mother and newborn (See Figure 5.1).

One key intervention – the presence of a skilled provider (e.g., physician or midwife) during delivery – can dramatically reduce birth asphyxia and trauma if a complication arises (See Figure 5.1).

FIGURE 5.1: INTER-RELATEDNESS OF INTERVENTIONS AFFECTING MATERNAL AND NEWBORN DEATHS



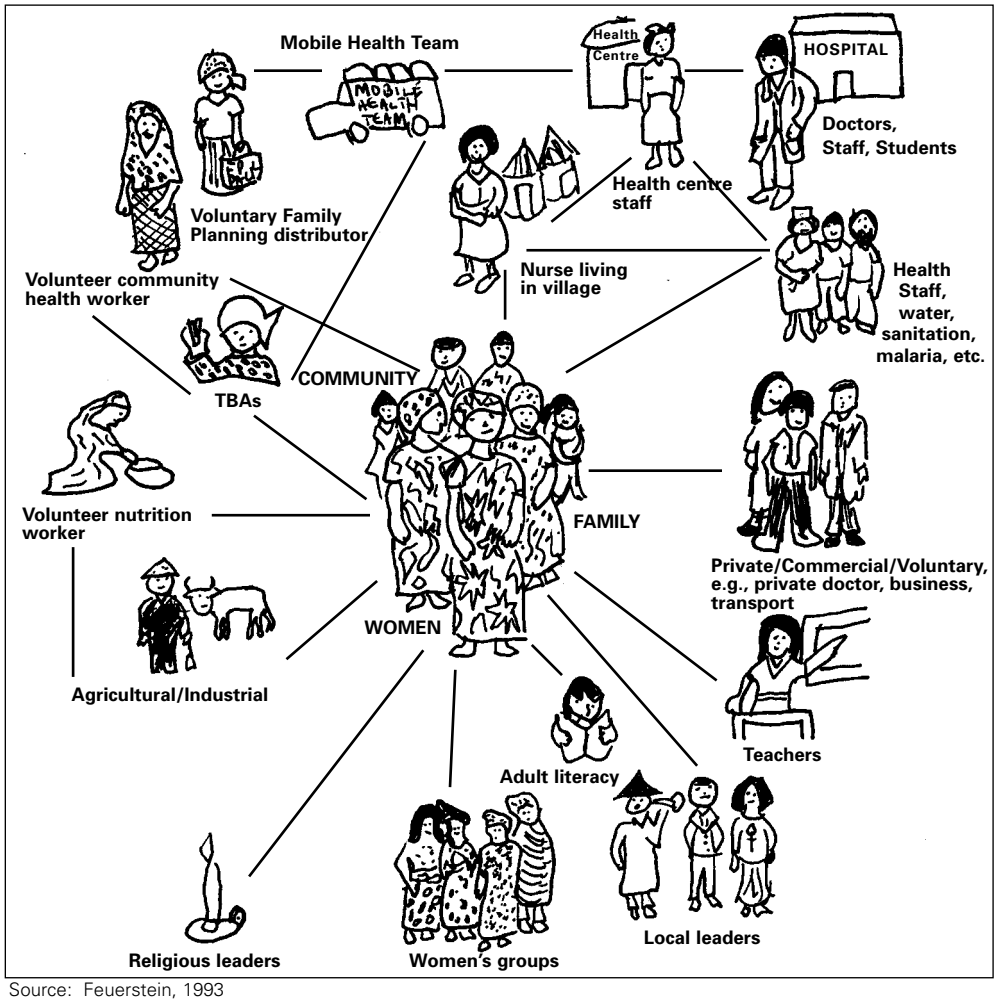
II. CROSS-CUTTING STRATEGIES AND INTERVENTIONS

A. Partnerships

In order to develop effective strategies that address the causes of maternal and neonatal mortality and morbidity, partnerships and coordinated efforts among governments, indigenous and international NGOs, the communities, households, the private sector, and bilateral and multilateral donor agencies are essential. It is highly unlikely that one organization will be able to provide all the key elements needed to address this complex problem. The global community needs to come together to design and implement multifaceted programs that address several factors contributing to maternal death.

We recognize that the responsibility for solving this problem lies with the health providers, communities, households and women themselves. Our role is to provide support to these groups so that they are able to implement context specific programs that address their particular needs.

FIGURE 5.2
Illustration of Types of Community Level Partnerships



Source: Feuerstein, 1993

> ***"… reducing maternal mortality requires sustained long-term commitment from a full range of partners. In community after community, governments, voluntary agencies, and local leaders are joining forces and resources to develop health care strategies that promote safe motherhood."***
>
> – Hillary Rodham Clinton, First Lady USA
> World Health Day, April 7, 1998

Government, NGOs, and the private sector are already providing some of these services (e.g., personnel, drugs, and medical equipment). Donors such as UNICEF, UNFPA, the World Bank, and the Japanese Government are often willing to provide equipment, renovations, and medications for obstetric services to support government and private sector services. USAID and DFID have undertaken research projects, developed demonstration models, and provided technical assistance to many countries, as well as procured contraceptives. Many donors including UNICEF, UNFPA, USAID, and CIDA provide technical assistance to upgrade family planning services in both the government and private sector. Non-governmental organizations have a key role to play in mobilizing the community and facilitating the community support systems to enhance women's access to obstetric services.

SUCCESSFUL PARTNERSHIPS

In Bangladesh, UNICEF assists the Government of Bangladesh (BDG) in 11 districts to upgrade their obstetric services at the district hospitals and in selected thana health complexes (health centers). The BDG provides the infrastructure and personnel, some equipment and medications, as well as support systems (e.g., supervision and MIS). UNICEF provides some equipment, drugs, and support for training that is conducted by the Bangladesh Society of Obstetrics and Gynecologists (BSOG) to enhance the management of obstetric complications. The BSOG consultants also provide monitoring visits and follow-up support for these areas. CARE, with support from the Dutch and Australians, only works in areas where the services have been upgraded to ensure that quality services are available once its community mobilization efforts (education, transportation and loan systems) are underway[45,54].

In Mexico, researchers, journalists, legislators, health officials, health providers, and NGOs came together to discuss maternal health problems at the National Safe Motherhood Conference in 1993. As a result, the Safe Motherhood Partnership was formed with a multi-sectoral task force established to oversee implementation of the action plan. This process was replicated in 10 states with Safe Motherhood Conferences conducted and action plans formed. Several innovative interventions were implemented through this process. For example, in several states, a model for detection of risk during pregnancy was tested. In addition, the Catholic Church launched a campaign to reduce violence against pregnant women in several states, an issue that had never been addressed[55].

Partnerships also need to be forged with sectors other than health. These may include the Ministries of Education, Trade, Agriculture and NGOs working in these areas. Table 5.1 gives illustrative examples of how other sectors can contribute to improving the Safe Motherhood program.

TABLE 5.1
INTER-SECTORAL ACTION NEEDED TO PROMOTE SAFE MOTHERHOOD

SECTORS/AGENCIES/PERSONNEL	EXAMPLES OF INTER-SECTORAL ACTION
1. **District Authorities** Local Government Officials Information Officers Political Leaders	• Participate in and provide venue for Safe Motherhood workshops. • Provide materials for building/renovating maternity wards. • Provide payment for community nurse-midwives.
2. **District Agricultural Department** Nutritionists Home Economists Agricultural Field Workers	• Provide seeds and expertise to women's groups growing vitamin rich vegetables (e.g., iron, Vitamins A and C). • Educate families on the nutritional needs of pregnant and nursing women.
3. **Agricultural/Commercial Cooperatives**	• Provide additional food to pregnant/lactating women through cooperatives. • Use commercial vehicles for transportation of women during an obstetric emergency. • Establish and maintain an annual fund for social welfare to access transportation or pay for services.
4. **Farmer and Worker Unions**	• Provide food subsidies to local health workers (e.g., community nurse-midwife). • Participate in scheme for low-cost sale of protein-rich foods to poorest pregnant and nursing women (e.g., eggs, chickens).
5. **District Community Development Department**	• Develop income-generating activities with women's groups to fund transport for emergency referrals. • Stimulate community action to build maternity waiting homes.
6. **Women's Unions/Groups**	• Participate with local health staff and voluntary health workers as part of community-based network for Safe Motherhood. • Provide female education on human sexuality, family planning, pregnancy, delivery, and post-natal care. • Encourage role plays comparing unsafe and safe delivery techniques.
7. **Youth Unions/Groups**	• Promote minimum marriage age (e.g., female 18 years). • Enable sexually active youths to use contraceptives to avoid unwanted pregnancies, STIs, and HIV/AIDS.
8. **District Education** Secondary Schools Primary Schools Teacher Training Colleges	• Within family life education, promote understanding of human sexuality, conception, FP, pregnancy, and childbirth. • Encourage and enable female children to attend primary school. • Train teachers in appropriate content and teaching methods for Safe Motherhood.
9. **Adult Education and Literacy Department**	• Involve mothers-in-law in female education sessions to communicate Safe Motherhood messages. • Produce literacy primers on Safe Motherhood themes. • Enable women to discuss sensitive and hidden issues like maternal morbidity and (induced) abortion.

TABLE 5.1 (cont.)
INTER-SECTORAL ACTION NEEDED TO PROMOTE SAFE MOTHERHOOD

SECTORS/AGENCIES/PERSONNEL	EXAMPLES OF INTER-SECTORAL ACTION
10. Industry Pharmaceutical/Other Manufacturers	• Enable wholesale purchase of obstetric drugs for lower cost retail to poorer women and health facilities. • Develop and provide low-cost dressings and sanitary pads to improve genital hygiene during and after delivery.
11. Commerce/Business Local Government Officials Information Officers Political Leaders	• Enable retail outlets to display and market simple low-cost birth kits along with family planning supplies. • Donate equipment and transport for Safe Motherhood activities in remote areas.
12. Private Health Sector Western Practitioners Traditional Practitioners	• Provide information and services (e.g., antenatal, delivery post-partum, and induced abortion care). • Participate in identifying beneficial and harmful delivery and abortion practices.
13. Transport	• Use vehicles for transportation in obstetric emergency. • Participate with women's groups to establish and maintain fund for emergency transport.
14. PVOs/NGOs	• Donate equipment (e.g., blood pressure machines). • Provide information and services. • Sponsor renovation of operating theaters or bicycles for rural midwives.
15. Religious Organizations	• Local religious leaders permit/encourage discussion of contraception/abortion/female circumcision. • Encourage access to maternal health services.

Source: Feuerstein, 1995

B. Policy

Although many countries have Safe Motherhood policies, fewer countries have comprehensive or fully-implemented policies. Many policy makers are unaware or misinformed, thus, they do not view maternal or neonatal mortality and morbidity as a problem or a priority. Overall, policies that perpetuate low women's status and that may need to be addressed include age of marriage, availability of medical termination of pregnancy (induced abortion), divorce and inheritance laws, women's education, equal pay, and female genital mutilation (FGM).

In many countries, regulations and licensure standards dictate the provision of health services, and they are larger barriers than the policy itself. These protocols usually articulate which: 1) cadre(s) of health personnel can provide what services; 2) level of facility can offer specific services; 3) items appear on the essential drug list; and 4) protocols are used for treatment of specific conditions. These regulations, which may or may not appear in the policy, often;

- ➔ restrict access to services;
- ➔ impose unnecessary tests or procedures; and/or
- ➔ limit the types of services offered by providers.

For example, in many countries, midwives are legally restricted from performing certain life-saving procedures, such as manual removal of the placenta. Since women often go to the midwives when an emergency arises, the midwives are forced to perform the procedure to try and save the woman's life, even if she has not been trained on the procedure. If the regulations would allow midwives to be formally trained in these life-saving procedures, the services could be provided closer to the woman's home and would be safer, ultimately leading to better maternal and newborn outcomes.

STRATEGIES Policy Change

Politicians and officials make key decisions regarding budget allocations, infrastructure and staffing patterns. Advocacy can play an important role in gathering support for maternal and neonatal health. Key target groups may include leaders at the national, regional and local levels, religious leaders, and professional associations (e.g., medical, nursing and midwifery). Religious leaders can be strong change agents and influence community attitudes, especially where men are the primary decision-makers, about the use of health services. These leaders need to understand the: 1) magnitude of the problem; 2) interventions that can address the problem; 3) actions that can be taken by the community and families to have favorable maternal and neonatal outcomes; 4) impact of a maternal death on the community and family; and 5) importance of women participating in the decision-making processes about health seeking practices.

Advocacy is important; however, it is difficult to make persuasive arguments without good data. Improvements in the information systems and use of the data, in the hands of decision-makers, can go a long way to increase the awareness of the policy-makers and program planners on the importance of the issues. Without this knowledge and subsequent "political commitment" to the issues, other efforts such as changing laws or budget allocations will be virtually impossible.

Although a Safe Motherhood policy may exist, it may not have been implemented at the local level for a variety of reasons. Policies are not very useful unless they are disseminated, their contents understood, and they are incorporated into daily practice. Health workers, through in-service training, need to be educated on the protocols and standards that are embodied in the policy. They need to embrace these protocols and incorporate them into their daily practice. These protocols and practices need to be reinforced through supportive supervision and refresher training to bring about sustained improvements in the quality of maternal health services.

INTERVENTIONS **Policy Change**

The first intervention to be undertaken in any country is a comprehensive review of the policies, regulations, licensure standards, and current protocols for maternal health services. A review could identify the main barriers to improving access to and use of maternal health services. There may be missing components in the policy or the policy may be too restrictive. If the policy is not inhibiting appropriate practices at the service delivery level, then it may not be necessary to change that aspect of the policy. Policy change can be very labor intensive, so the areas to be addressed should be carefully selected and targeted with specific strategies to change the policy (or regulation) and implement the changes throughout the health care system.

Providers and program managers need to be educated about the role of advocacy and how they can incorporate this into their current work. They can also play a vital role in the data collection, analysis, and feedback mechanisms. The health staff can use this information to make decisions to improve service delivery and to advocate on their own behalf.

Since physicians are scarce in many countries, especially in the rural areas, it may be appropriate to build the demand for increasing the use of midwives. This demand has to be matched with appropriate policies that are in place to increase the number of midwives as well as enhance their ability to provide a wider range of services than they may currently be allowed to offer.

Policy issues may include: 1) standards for entry into midwifery education; 2) ways to increase the number of midwives trained (e.g., programs to train TBAs to become auxiliary midwives); and 3) increasing access to midwifery training in rural areas, where the greatest shortages of midwives exist.

C. *Improving Services*

All countries have health systems with facilities and personnel. However, in many countries improving access to obstetric care services has not been a priority. Upgrading existing facilities and skills of health personnel, often for relatively low costs, can make significant improvements in the quality of services and ultimately in maternal and newborn outcomes.

Health care services for pregnant women are often vertically organized which requires repeated visits to facilities to access different services. Services do not necessarily have to be fully integrated, but sufficient linkages between the community and the health facilities, as well as among the various health facility levels to enhance access to all the services should be established. There is a need for the dissemination of information to women regarding: 1) what services are available; 2) at which health facility are they available; and 3) on which day(s) services are available; so that women can better access a comprehensive array of services.

Women of reproductive age need to have access to the full range of services presented below.

- ➔ **Family Planning**
- ➔ **Prevention and Treatment of STIs**
- ➔ **Antenatal Care**
- ➔ **Obstetric First Aid** (in the community)
- ➔ **Obstetric Services**
- ➔ **Post-Partum and Post-Abortion Care**
- ➔ **Newborn Care**

Each service should be performed by a competent provider and regularly available at an affordable price. "High quality" reproductive health services should include the components listed below.

- ♦ Adequately skilled providers.
- ♦ Sufficient amounts of contraceptives, medical supplies, drugs, blood and anesthesia.
- ♦ Appropriate technology (e.g., MVA, minilap, C-section).
- ♦ Adequate support systems (e.g., MIS, record keeping, drug inventory).
- ♦ Clean environment with adherence to infection prevention practices.
- ♦ Informed choice about all procedures and treatments.
- ♦ Privacy during examination, ideally by a female provider.
- ♦ Prompt and appropriate treatment.
- ♦ Stabilization of client and appropriate referral in a timely manner.
- ♦ Referral and follow-up of women.
- ♦ Male partner involvement and involvement of family members.
- ♦ Mother and women-friendly centers that provide respectful care, including complete information in a supportive environment that encourages women and their families to ask questions, offers amenities that are culturally appropriate, and allows the incorporation of non-harmful traditional practices in the delivery of maternal health services in institutions.

Presented below are some steps towards providing quality maternal health services.

ILLUSTRATIVE STEPS TO IMPROVING SERVICES

Needs assessment, including qualitative and quantitative data collection and participatory methodologies as appropriate (See Chapter 4).

Analysis and prioritization of needs (See Chapter 4).

Improvement in staff's clinical skills: develop criteria for selection of trainees, assess skills and areas for improvement, develop culturally sensitive curriculum, utilize competency-based training approach that is culturally appropriate and participatory, ensure adequate practice sites and client case load, conduct supportive supervision, and develop system to follow-up trainees.

Improvement in staff's interpersonal skills: develop criteria for selection of trainees, assess skills and areas for improvement, develop culturally sensitive curriculum, agree on key behaviors that promote respectful treatment of women and dialogue between the parties (e.g., privacy, non-judgmental environment, allowance to ask questions), utilize participatory training approach on interpersonal skills and how to use IE&C materials, ensure adequate time to practice new skills, and conduct supportive supervision to correct errors and reinforce positive behaviors.

Improvement in information systems: identify the type of information needed for program planning and only collect information that will be used, develop health cards and/or registers, provide training to staff on these data collection tools, utilize "hands-on" training approach on data analysis and use of information for decision-making.

Improvement in drugs and supplies: articulate clear roles for staff involved in the system, develop appropriate system based on local situation, develop information and inventory control system to properly manage stocks, develop a plan to ensure adequate buffer stocks to overcome constraints (e.g., seasonal difficulties, poor transportation), provide "hands-on" training on ordering, forecasting, storage and inventory control functions and forms for the system, and facilitate overall management of supplies to avoid stock-outs.

Improved management: develop job descriptions, define clear roles and responsibilities, provide practical training on budgeting, incorporate the use of quality assurance tools on a regular basis to identify weak areas, provide continual improvements, develop information and supervision systems, formulate and regularly review annual workplans with staff input.

TABLE 5.2

Current Best Practices

QUALITY MATERNAL HEALTH SERVICES

1. **Promotion and protection of health:** Women and their families need to know about pregnancy and childbirth, understand the danger signs, know where they can obtain services, and how to get to the facility.

2. **Accessibility and availability of services:** Women should be able to access a full range of prompt quality services, provided by technically competent providers, at the lowest appropriate level in the health system.

3. **Acceptability of services:** Women need privacy and many prefer a female provider. They should be assured of confidentiality and have the support of their family members. Health providers should respect cultural beliefs and practices.

4. **Technical competence of health care providers:** Technical competence depends on regular training/retraining and clear guidelines for clinical treatment. Supervision and case reviews are also essential to sustain technical competency.

5. **Essential supplies and equipment:** Inventory control and logistics management standards should be established. This will ensure that necessary supplies and equipment at each level will be available on a regular basis.

6. **Provider interaction:** Providers must offer accurate, appropriate information, treat clients with respect, be responsive to their needs and avoid judgmental attitudes.

7. **Information and counseling for the client:** Clients should have the opportunity to talk and ask questions with the health care providers and should be offered guidance on any health problem that is identified.

8. **Involvement of clients in decision-making:** Providers should see clients as partners in health care and should involve them in decision-making as active participants in their own health care.

9. **Comprehensiveness of care and linkages to other reproductive health services:** Maternal health care has a unique opportunity to provide women with comprehensive reproductive health care and address other issues, such as nutrition and STIs.

10. **Continuity of care and follow-up:** Maternal health services should be part of a comprehensive program including antenatal, delivery, and post-partum care. Women must be seen as people with health needs that continue throughout their lives.

11. **Support to health care providers:** Health care providers at all levels need the economic and social support of the State and the communities in which they work.

Source: WHO, 1994

STRATEGIES Improving Services

Upgrading services has two components: enhancing access to services and improving the quality of the services. Access will be discussed in Sections IV, V, and VI of this Chapter. Improving quality of services is presented below.

As previously stated, service improvement requires a multifaceted approach. All aspects of service delivery (e.g., skilled staff in counseling and clinical procedures, support systems such as MIS and logistics management, and overall management) must be fully operational for quality to be ensured and sustained.

First, there needs to be an overall commitment on the part of the health staff to identify the problem(s) that affect the quality of patient care. Areas of improvement may be knowledge, behaviors, skills, systems or some combination of these. Second, the staff needs to prioritize the weak areas identified and select feasible solutions to strengthen them. Several assessment tools exist to assist the staff to begin and sustain the process of self-improvement.

- ➔ Client Oriented Provider Efficiency (COPE) developed by the Association for Safe and Voluntary Contraception.
- ➔ Situational Analysis developed by the Population Council.
- ➔ Needs Assessment developed by WHO.
- ➔ Needs Assessment developed by ACNM.

Strategies for the specific topic areas that need to be strengthened are presented in the following sections.

In Angola, the CAOL Project (Coordination of Delivery Attendance in Luanda) works to reduce maternal mortality by directing deliveries to the appropriate level of care and improving referral procedures. The CAOL model features three levels of care:

- ➔ peripheral maternity units for normal delivery with complications that do not require surgical interventions (basic EOC) – these units have ambulances to transport to the second tier;
- ➔ hospital offering surgical capacity; and
- ➔ a university-affiliated referral hospital.

There was an increase in the number so births at the peripheral level with minimal intervention and a decrease in the number of births – but more specialized care – at higher referral levels. Overall, deaths have declined.

UNICEF, 1998.

D. Human Resource Development (HRD)

Development of human resources is a vital component of service delivery, enhancing quality and ultimately increasing the use of maternal health services. Human resource development (HRD) is a broader concept than just training. It focuses on the growth of core competencies that allow an individual to expand his/her potential and contribute to the overall mission of an institution.

In this situation, HRD includes: 1) redefining roles of various health care workers to maximize access and improve quality of care; 2) providing opportunities for health workers to learn and practice their skills, until they are competent and confident, to appropriately manage obstetric complications; and 3) promoting a favorable environment to offer quality services (with adequate supervision, drugs and supplies).

Common problems facing many health systems in the developing world are:

1. **insufficient quantities of skilled personnel;**
2. **frequent transfers of trained personnel;**
3. **little rewards for good performance;**
4. **inadequate environment to provide services; and**
5. **poor, infrequent and/or judgmental supervision.**

Another serious problem that must be mentioned in terms of HRD is the poor compensation of health workers. Motivation of health workers is often low, particularly in the public sector. This is due to the fact that their salaries are usually very low and often not set at a livable wage. In addition, their earnings may not arrive on time, often times delayed by many months, or part of their earnings may be taken by a corrupt system. As a result, in many countries, health workers are forced to also work in the private sector to sustain their livelihood. While this problem is not within the scope of this document, program planners must be cognizant of this situation and its effect on the availability and quality of health services. In many settings this may be one of the key constraints to improving the quality of maternal health services.

ROLES

Skilled human resources are scarce in most developing countries, particularly in the rural areas. There are a variety of formal sector (e.g., doctors, midwives) and informal sector (e.g., TBAs, village doctors, traditional healers) health workers. These cadres have diverse educational backgrounds, roles, responsibilities and reputations within the community and with the women they serve. However, they are all involved in providing information and/or services to women and their newborns in one way or another. In many settings women go to the traditional practitioners first when a problem occurs. This practice of seeking services from traditional healers first needs to be understood and acknowledged by the formal health sector.

Policies, licensure regulations and cultural norms dictate the roles of health workers. The service delivery protocols are usually better defined for professional health workers (e.g., nurses) than for community or informal sector workers (e.g., traditional healers). Countries need to have clearly defined roles and responsibilities for the various cadres to support their objectives without reducing access to services while ensuring that quality is maintained.

If we return to the different goals of **"health promotion"** and **"mortality reduction,"** it becomes clearer to see the delineation of roles. Studies have shown that TBAs have not been effective in reducing maternal mortality. Therefore, if "mortality reduction" is the only goal, the key intervention is to ensure that all women deliver with a skilled provider (e.g., doctor, nurse, or midwife). **However, if the goal is a combination of "health promotion" and "mortality reduction", there may be some roles that the TBA can fulfill** while encouraging women to deliver with a skilled provider. Since this reference manual promotes the position that both goals are important, appropriate roles for TBAs, midwives and physicians are discussed below.

A skilled provider is a doctor, midwife, or nurse who has completed a set course of study. They are trained to manage normal labor and delivery, recognize the onset of maternal and neonatal complications, perform essential life-saving skills, initiate treatment, and supervise the referral to a higher health care facility.

The skilled provider (preferably a doctor, midwife, or nurse with formal midwifery training) has four main responsibilities, to:

- support the woman, her partner and family during labor, at moment of birth and in the immediate postpartum period;
- observe the woman during labor; monitor fetal condition and condition of infant after birth;
- perform essential interventions, where necessary, including amniotomy and episiotomy; and
- assess risk factors, detect problems early and refer the woman to a higher level of care, if necessary[98].

ROLES Traditional Birth Attendants

We must not forget that only about half of all women in the developing world currently deliver with a trained attendant, which includes trained TBAs, nurses, midwives and doctors. A smaller percentage actually deliver with the assistance of a skilled provider (See Tables 3.3 and 3.4). Almost 60 million women deliver with untrained assistance, a family member, or alone. **Therefore, while we must strive to increase the use of skilled providers (e.g., mostly midwives) this transition needs to be seen as a progressive, long-term process that will be realized through a series of sequential steps.** Experience has shown, in countries like Malaysia and Sri Lanka, that the shift from utilization of TBAs to midwives has taken about 20 years to complete.

In many countries TBAs are an important liaison between the community and health institutions. While the TBA alone cannot prevent death once a complication arises, she can contribute to the system by making motherhood safer. Providing TBA training on clean and safe delivery practices, proper management of labor, early recognition of danger signs, and knowledge of where obstetric services are available can contribute to this goal[13].

We must strive to increase the number of women who deliver with a skilled provider.

While building the capacity of midwives, TBAs need some support to ensure that there is no lapse in services during this transition, particularly in countries where they attend a large percentage of the births. Elements to be considered in developing a transitional plan include a review of the proportion of home and institutional births, percentage of deliveries with TBAs and skilled providers, the role of TBAs and midwives in that setting and availability of skilled providers. A strategy that develops and strengthens the relationship between the TBAs, communities and formal health care system will assist in more clearly defined roles and improvements in the referral system.

While TBAs are certainly not the "magic bullet" to reduce maternal mortality, they may be able to assist in **"health promotion"** through the activities presented below.

- Identify pregnant women within the community.
- Assist medical personnel in tracking women.
- Educate women within the community on good nutrition and reduction of workload.
- Encourage couples to plan for childbirth.
- Encourage women to attend antenatal care.
- Educate women and family members on the danger signs during pregnancy and the post-partum period.
- Educate and motivate family members to get pregnant women to an appropriate referral center in a timely manner.
- Assist with normal deliveries.

- Practice aseptic techniques (e.g., clean deliveries) to reduce infections.
- Recognize complications, have knowledge of referral site and escort women to an appropriate referral center
- Visit (home) within the first 24 hours to assess mother and newborn.
- Provide/distribute/market iron tablets, Vitamin A, ORS, bednets, home birth kits, and/or family planning counseling and supplies.

ROLES Midwives

The roles and types of midwives vary greatly by country as well as by the amount of training they receive, and the services they can provide. In some countries midwives have a great deal of responsibility. For example, they may operate private maternity homes in many parts of Africa. Other countries, such as India, have auxiliary nurse midwives who have much less training and responsibility. In some Latin American countries, there are no formal midwives.

A midwife can serve as the first referral point for the TBA at the community level. **Data from the Matlab study revealed that posting midwives in villages resulted in increased utilization of clinic services and improved management of obstetric complications[56].** Of course the effectiveness of midwifery care in decreasing maternal mortality depends on their skill level as well as the health infrastructure and the referral system.

In general, nurses and midwives are the most accessible health care provides for women, especially rural women, because they are posted at the periphery of the health care system. **In addition, most midwives are women, and in some cultures (e.g., Muslim) it is very important to have a female health provider offer these services.**

Many midwives have gained expanded roles and respect. In some settings this rise in status has largely come through active involvement in their professional associations (e.g., Ghana and Uganda). These associations provide training, supplies and other benefits to their members as well as advocate on their behalf. There are numerous examples where midwives have been trained to provide quality services that are usually only offered by physicians.

- **In Mozambique,** where there are only about 12 Ob/Gyns in the country, nurses have been trained to perform Cesarean sections for complicated deliveries. The outcomes of the C-sections have been as good as those performed by specialist obstetricians.
- **In Uganda,** midwives prescribe antibiotics and perform vacuum extraction to assist women with difficult births[57].
- **In Ghana,** the midwives were trained to provide post-abortion care services, including manual vacuum aspiration for treatment of (induced) abortion complications and post-abortion [redacted]ning counseling and services[58].

Physicians

Physicians are usually concentrated in large urban areas and in many countries the majority are men. In some countries only obstetricians can perform life-saving skills, which severely limits access to maternal health services, particularly in the rural areas. In many settings it is culturally prescribed that a female provider conduct maternal health services, but many countries have very few female doctors. Physicians can play several roles, if they choose, that will enhance access to and quality of maternal health services as presented below.

- Encourage decentralization of life-saving skills. This can include expanding the role and training of general practitioners and midwives who are usually based in the rural areas to provide life-saving skills.
- Include family members in the delivery room setting with the woman during childbirth.
- Provide supportive supervision to general practitioners (physicians) and midwives.
- Establish programs that encourage enrollment of women into medical schools.
- Develop appropriate protocols to provide quality services in poorer resource settings[57].

Life-saving skills include: the prevention and management of hemorrhage, shock, sepsis, and eclampsia; monitoring progress of labor; resuscitation of newborns; and management of abortion complications.

TABLE 5.3
DIFFERENCES BETWEEN EMERGENCY OBSTETRIC CARE (EmOC) AND LIFE-SAVING SKILLS (LSS)

EmOC	LSS
1. Surgical Obstetrics	1. Vacuum Extraction and Referral
2. Anesthesia	2. Local Anesthesia and Referral
3. Medical Treatment	3. IV Antibiotics, IV Sedatives, and Referral
4. Blood Replacement	4. IV Rehydration and Referral
5. Manual Procedures	5. Manual removal of placenta, Bimanual compression

Source: WHO, 1996 and ACNM, 1995

TRAINING

Physicians, including obstetricians, pediatricians, general practitioners, nurses and midwives need training in all reproductive health services, especially life-saving skills. The skills required depend on the setting, the cadre of health workers, and the type of services they will provide. Life-saving skills include; prevention and management of hemorrhage (e.g., assisted delivery, manual removal of placenta), shock and sepsis (e.g., intravenous antibiotics), monitoring progress of labor (e.g., partograph), resuscitation of newborn, and managment of abortion complications (e.g., manual vacuum). In most countries midwives are trained to provide basic obstetric services and blood replacement while C-sections are performed by physicians, although this can be adapted to the setting.

Both pre-service (within institutions such as medical and midwifery schools) and in-service (on-the-job) training is necessary in order for quality obstetric services to be established, strengthened, and expanded. Pre-service training is needed to ensure that the system is institutionalized throughout the country. It also ensures that new health care providers acquire the requisite skills to appropriately manage life-threatening obstetrical complications, prior to their graduation.

Continued in-service training, with supportive supervision, is needed to ensure that current providers are trained in new life-saving skills and can incorporate these skills into their current practice. Refresher training will also assist in maintaining quality of care standards.

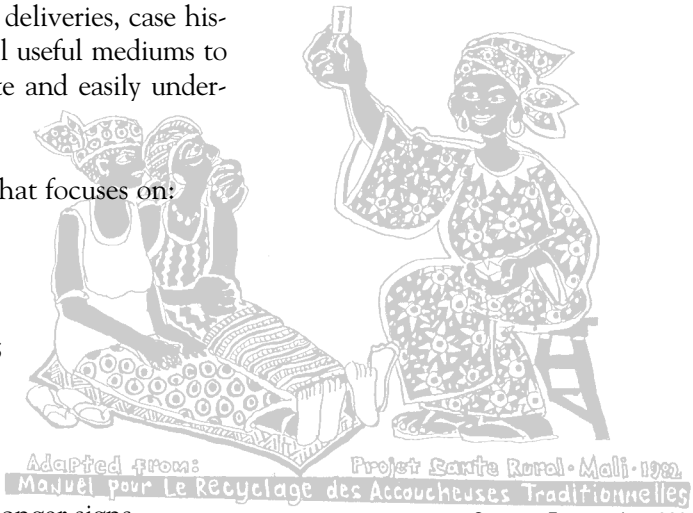
Both types of training should be competency-based, meaning that the trainee practices until he/she can demonstrate the requisite skills to competently and confidently perform the procedure. Appropriate practicum sites are needed. These sites need to be equipped with knowledgeable preceptors and they require sufficient caseloads to ensure that trainees have ample opportunities to observe and manage a variety of obstetric complications in order to be technically competent. The number of procedures needed to be performed will vary by trainee. This is in contrast to quota training where every participant has to complete the same number of procedures. Use of creative teaching techniques, such as distance learning with local midwifery mentors, may be appropriate in some settings. Training should be conducted at the lowest level possible (e.g., region or district for midwives and in towns or villages for TBAs) to encourage the providers to remain near their home area.

TRAINING Traditional Birth Attendants

Training for TBAs has been most successful when it is conducted in short sessions which builds on their experience, involves the local health personnel, and is provided in a non-judgmental environment. This approach facilitates a better rapport between the TBAs and the health personnel in the facilities. The training should be as participatory as possible; lecture style is not the best method, especially since many TBAs may be illiterate. Activities such as body mapping, role-plays, simulated deliveries, case histories, drama, story telling, singing, and dancing are all useful mediums to disseminate the information in a culturally appropriate and easily understandable way.

ACNM has a useful curriculum for training TBAs that focuses on:

- ➔ clean delivery practices;
- ➔ minimizing harmful practices;
- ➔ identifying danger signs with prompt referral;
- ➔ obstetric first aid/referral;
- ➔ good newborn care;
- ➔ immediate breastfeeding; and
- ➔ monitoring the first 24 hours after birth for danger signs.



Source: Feuerstein, 1993

Physicians, Nurses and Midwives

A team effort can facilitate sharing of information and technical support among the team members. It can also maximize the effectiveness of the referral system by having clearly defined roles and criteria for transferring a woman to a higher level facility. Both WHO and ACNM have developed guidelines or protocols for treatment of specific complications.

BEST REFERENCES

WHO's series of "practical guides", including: **Normal Delivery at the Health Center, Essential Obstetric Care at the First Referral Level, Post-Partum Hemorrhage, Pre-eclampsia, Clinical Complications of Abortion, Sepsis, Obstructed Labor, and Newborn Resuscitation.**

ACNM's manual on **Life-Saving Skills for Midwives**.

ACNM's manual on **Healthy Mothers, Healthy Newborns**.

ACNM's lifesaving skills approach goes beyond just training and involves participation of key stakeholders in the health system and communities. The competency-based training curriculum has been implemented in Ghana, Nigeria, Uganda, Indonesia and Zambia with some adaptation occurring in each setting. The main topics of the training are:

- ➔ role of the midwife;
- ➔ antenatal risk assessment care, including treatment of anemia, infectious disease, counseling on danger signs, IFA consumption, TT vaccination;
- ➔ identification of danger signs and prompt referral;
- ➔ monitoring labor progress, including history and physical, and use of partograph/partogram to monitor the progress of the mother and newborn (Note: The partograph provides a rapid and standard reading of the progress of labor that can be shared. It also provides early warning of complications and monitors the fetal heart rate.);
- ➔ episiotomies and repair of lacerations;
- ➔ prevention and treatment of hemorrhage;
- ➔ resuscitation of the infant and mother;
- ➔ prevention and management of sepsis;
- ➔ hydration and dehydration;
- ➔ vacuum extraction; and
- ➔ symphysiotomy[59].

E. Health Education for Behavior Change

Information, education, and communication (IE&C) activities are important to increase knowledge; however, this is only the first step in behavior change. Health education can deliver messages through a variety of media channels, such as print, posters, flipcharts, radio, television, video, plays, skits, puppet shows, etc. The message(s) and channel(s) selected need to be appropriate for the target audience. Pre-testing messages, on a sample of the target population, is essential to assess if the material is culturally appropriate, reflective of local conditions and perceived by the audience the way it was intended. Furthermore, communication approaches need to be tested to ensure that the strategy utilized will result in the desired behavior change (e.g., increased use of maternal health services).

Health education strategies need to focus on several target groups with reinforcing messages in order to foster an enabling environment for women and newborns to access care. Key target groups (locally determined) include key household decision makers (e.g., mothers, mothers-in-law, husbands) which vary greatly by setting, community leaders and other influentials (e.g., village doctor), as well as women. Special target groups may include non-pregnant adolescent girls, newlyweds, and primigravidas (first pregnancies). Adolescents, especially primigravidas, are often vulnerable because of their:

1. immature physiology resulting in high incidence of obstructed labor and hypertensive disease;
2. lack of access to accurate information and antenatal services; and
3. very limited decision-making ability.

Another important audience is health personnel. Many providers have not received any training in interpersonal communication, counseling skills, or appropriate use of IE&C materials. **Studies have shown that a significant proportion of women do not access health services because staff members either ignore them or treat them rudely**[21, 22]**.** Behavior change strategies need to focus on changes in the providers' skills as well as in their attitudes and demeanor. Health provider training must include instruction about how to use educational materials in the most effective manner to promote behavior change among their clients. These efforts need to focus on creating "Mother Friendly" environments that stress the client's rights, transparency, and accountability.

WOMEN NEED TO HAVE INFORMATION ABOUT:
➔ **DANGER SIGNS FOR THE MOTHER DURING PREGNANCY, CHILDBIRTH AND POST-PARTUM** (See Table 5.5, 5.15, 5.16, 5.17)
➔ **DANGER SIGNS FOR THE NEWBORN** (See Table 5.15, 5.19, 5.20, 5.21)
➔ **BIRTH PLANNING** (See Table 5.8, 5.9)
➔ **IMPORTANCE OF A SKILLED PROVIDER AT DELIVERY**

F. Community Mobilization

We recognize that the responsibility for solving this problem lies with the health providers, communities, households, and women themselves. Our role is to provide support to groups so that they are able to realize their potential to implement context specific programs that address their particular needs.

We recognize that the responsibility for solving this problem lies with the health providers, communities, households, and women themselves.

Households do not exist in isolation; they are embedded in communities that are often poorly equipped to engage in collective action required to advance their health needs. Community norms and social structures influence household behavior, yet many issues must be addressed at the community level since they require collective action (e.g., transportation). Community empowerment for health may be thought of in six dimensions:

1. participation of both women and men;
2 organizational skills for problem identification and formulation of a well-defined strategy;
3. capacity development to implement and coordinate activities;
4. effective communication;
5. leadership support; and
6. resources identification, coordination, and control.

Communities are not stagnant entities; they are constantly evolving in response to changes in their environment. **Community mobilization can be viewed as a process by which communities proceed to assume more control for their own health practices and services.** It should be noted that communities may be at different phases of development per issue. For example they may be more developed in terms of agricultural activities than health behaviors.

This evolutionary process consists of:

- ➔ consulting with the community about their needs;
- ➔ engaging the community in an analysis of the problem;
- ➔ involving the community in decision-making at all stages;
- ➔ creating a demand for services at the grassroot level;
- ➔ facilitating community control of services through monitoring the quality of the services and/or supervising the health staff; and
- ➔ promoting self-reliance[60].

Program designs, in partnership with communities, must take into account community resources and their stage of development when selecting interventions and planning implementation. Communities are often overwhelmed because they receive too much assistance without enough time to adequately absorb and synthesize inputs.

STRATEGIES Community Mobilization

Communities have several critical roles to play in promoting maternal and newborn health and specifically addressing some of the delays in accessing obstetric care. These roles may include promoting community norms for adopting healthy behaviors, enhancing compliance with prescribed regimens such as iron consumption, supporting early pregnancy identification and registration, identifying blood donors, and articulating social support that can be provided (e.g., childcare).

Although it is imperative that quality obstetrical care services be available, if the community is not educated about the importance of the problem and roles that they can play, maternal and newborn outcomes will not improve.

Political commitment, through support from village leaders, local officials and non-governmental organizations, can initiate and sustain community support for positive behaviors. Village leaders and local officials have donated their time, labor, and resources (personal and official) to support maternal health efforts in a variety of settings. Many NGOs have a good understanding of the communities that they serve. They may be able to assist with low cost loans or serve as brokers between the health officials and the community. Strategies specific to the four delays are discussed in the following sections.

INTERVENTIONS Community Mobilization

Community systems that support access to maternal health services need to be location specific and deal with the main constraints that impede access to health services in that setting. A needs assessment is the first step to understand the beliefs and practices as well as to identify community resources and household decision makers in a particular setting. Participatory methodologies, such as the Participatory Rural Appraisal (PRA), Participatory Learning in Action (PLA), or the Warmi Approach developed by MotherCare/Save the Children in Bolivia, can promote community involvement among a wide set of opinion leaders and influentials from the outset. This participation continues through each program stage of issue identification, prioritization, problem-solving, implementation, and evaluation.

The barrier(s) identified may be very complex and may need to be addressed from several perspectives. Implementation needs to reflect all the aspects that inhibit access to health services. For example, transportation may be recognized as the main barrier, but there could be many reasons such as:

1. seasonal difficulties (e.g., monsoon);
2. attitudes of transport workers;
3. several types of transportation are needed to reach a health facility;
4. crime or security;
5. lack of or poor condition of roads; and/or
6. landmines.

III. WOMEN OF REPRODUCTIVE AGE

Although preconception services are very important, the purpose of this document is to focus on maternal health services once a woman is pregnant, so this section is limited. The main interventions that should be available to a women of reproductive age include nutrition education and supplementation, family planning in order to choose the number and timing of her children, prevention and treatment of STIs, and general health services to enhance her knowledge and understanding of her body. Table 5.4 identifies what services need to be available to men and women of reproductive age.

BEST REFERENCES

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Potential interventions to reduce prepregnancy factors.

- Promote women's rights, rather than merely responding to their needs and problems, through the education of girls and women while expanding knowledge of legal rights, democracy, negotiation, and business skills.
- Provide health education to minimize harmful practices and maximize beneficial behaviors.
- Improve nutrition through education promoting consumption of locally available foods, implementation of home gardens, food fortification, and supplementation where necessary.
- Improve women's status, empowerment, and decision-making through literacy, income generating activities (IGA), and credit programs.
- Work to delay marriage and first birth through education, IGAs, and/or policy or legal interventions.
- Address violence, abuse, and FGM.

TABLE 5.4

Current Best Practices
PRE-CONCEPTION

RECOMMENDED SERVICES

1. Health education/counseling on reproduction.
2. Access to FP services (clinical, CBD, social marketing).
3. Nutrition for adolescent girls including micronutrients (Vitamins A, Iron, Iodine).
4. Screening and treatment for STIs/RTIs.
5. Community mobilization/support.
6. Quality of care.
7. Functional management systems to support referrals.

LONG-TERM INTERVENTIONS

1. Income generation activities.
2. Girls' education.
3. Women's empowerment/decision-making.
4. Caring practices, such as dealing with FGM and child labor.

Potential interventions to improve access to quality reproductive health services are:

- Provide health education and counseling to address beliefs, increase knowledge, ensure informed choice, and promote behavior change for FP and STI services.
- Improve the availability and accessibility of FP services through community-based distribution (CBD) and clinical services in both the public and private sector.
- Improved quality of reproductive health services through the provision of training health workers and other distributors of FP supplies to enhance their counseling and supervision skills.
- Improved quality of care by training health workers on counseling skills and the prevention and syndromic management of STIs.

IV. ANTENATAL

Most countries provide antenatal care services. However, use is often low because services are not accessible, providers are not well-trained, and/or all too often, women do not understand the importance of these services. Many women, especially adolescents and primigravidas, do not receive adequate antenatal care because they lack information, do not recognize or admit their pregnancy until the second or third trimester, and generally have less status in the family.

Antenatal care alone, however, is not able to predict difficulties that occur at the time of delivery or in the post-partum period.

Antenatal care can be an excellent opportunity to develop a rapport with the health provider. It is a good time to provide information to the pregnant women on: 1) the importance of adequate nutrition, including treatment of micronutrient deficiencies; 2) tetanus vaccination; 3) danger signs; and 4) the development of a plan for childbirth which includes how to deal with a complication, if one should arise. Women also need to understand that antenatal care is important because it also affects the newborn's outcome. Poor newborn outcomes include; low birth weight (LBW), anemia, infections, malaria, and tetanus. Sexually transmitted infections, especially HIV and syphilis, are also associated with devastating newborn outcomes including fetal wastage, spontaneous abortion, stillbirth, prematurity, congenital abnormalities, congenital syphilis, and HIV[4, 21, 22].

Antenatal care alone, however, is not able to predict difficulties that occur at the time of delivery or in the post-partum period. Therefore, women need to be counseled about their potential risk, and a functional referral system needs to exist so that women identified with a complication can obtain appropriate obstetric services.

STRATEGIES Antenatal

In the past, antenatal care has been based on screening women using the "four toos" (too young, too old, too soon, too many) as previously discussed in Chapter 3. These parameters, however, have been found to only correctly identify between 30 to 40 percent of all pregnant women who develop an obstetric complication(s)[38].

Studies have shown that ALL pregnant women are at risk for maternal mortality and morbidity. Obstetric emergencies CANNOT be predicted or prevented, but they can be addressed with prompt recognition and appropriate management[4,6,8,20,31,43]. Therefore, all pregnant women should be counseled that they all are at risk for developing a complication. Screening, identification, and referral of pregnant women with "risk conditions" can only occur in areas where health infrastructures are capable of concretely addressing these conditions.

A two-pronged approach is needed to adequately address this problem. First, emphasis must be placed on educating women, men, and family members about the importance of planning for childbirth, compliance with good antenatal practices (e.g., IFA), recognition of danger signs for the mother and the newborn, and prompt referral. Second, further research needs to be conducted to develop better screening parameters and to understand the role of social risk in this process (See Table 1.1). Screening parameters that can be used to monitor a woman's pregnancy are included later in this section.

While antenatal care delivered by a skilled provider is important, many of the components can be provided through other mechanisms that reach a larger proportion of women. "Demedicalization" of some components, such as distribution channels for micronutrients, nutrition education, and birth planning, may increase acceptability, foster community ownership, reduce the provider's workload, and lead to sustainability.

TABLE 5.5

Current Best Practices
PREGNANCY

Every women must know that she may develop a pregnancy-related complication, each time she becomes pregnant.

BIRTH PLANNING: Planning is needed to ensure that women have safe, healthy pregnancies. This may mean that she has a clean delivery with a skilled provider (e.g., midwife, doctor). It also means that women and their families can identify danger signs, know which facility to go to, know how to get to the nearest appropriate facility, and can mobilize resources (transportation, money, or blood) to access those services.

SCREENING: Screening for complications – instead of the "at risk" approach – is needed to quickly identify women with complications and make the necessary arrangements to refer them in a timely manner to an appropriate facility. In addition, current screening parameters (the "four toos") need to be refined to enhance their accuracy in identifying women who may develop complications.

CLEAN BIRTHS: All women are entitled to a clean delivery (6 cleans), at home or in the hospital, by a skilled provider. This also includes keeping the baby clean, dry, warm, and providing immediate breastfeeding.

POST-PARTUM CARE: All women should be educated about the danger signs and closely monitored for the first 24 hours.

NEWBORN CARE: Newborns should be closely monitored for the first week placing attention on breathing, immediate breastfeeding, cord and eye care, and keeping the baby dry, clean, and warm.

MATERNAL DANGER SIGNS
SEEK IMMEDIATE ATTENTION

PREGNANCY	CHILDBIRTH	POST-PARTUM
Bleeding	Heavy bleeding	Heavy bleeding
Convulsions	Convulsions	Convulsions
Pale, labored breathing	Fevers, chills, discharge	Fever, chills
Headache	Labor longer than 12 hours	Discharge
Swollen hands/face	Malpresentations	
High fever	Placenta not delivered in 30 minutes	

TABLE 5.6

Current Best Practices
PREGNANCY

1. ANTENATAL CARE (ESSENTIAL SERVICES)

- TT Immunization
- Treatment of Anemia
- Treatment of Infections in Endemic Areas (e.g., Malaria, Hookworm)
- Screening and Treatment/Referral (syndromic management) for STIs/RTIs, especially syphilis
- Four visits if possible: Good history that identifies previous pregnancy-related complications, physical information (fundus, position of the fetus), BP (especially after week 28), and weight, if possible
- Health Education (nutrition, reduce workload, return to fertility, FP, immediate and exclusive BF, and symptoms of STIs)
- Birth Planning
  - ➔ What can be expected during pregnancy (date of delivery)
  - ➔ Nutrition counseling/encourage reduction of workload
  - ➔ Know/identify danger signs in pregnancy, childbirth, and post-partum periods
  - ➔ Select and use skilled provider/mobilize materials for clean birth
  - ➔ Know/plan which health facility to go to, how to get transport, and how to mobilize resources to pay for transport, supplies and services, if complications arise
  - ➔ Know about the importance of immediate and successful breastfeeding
  - ➔ Know about danger signs in the newborn
  - ➔ Know about post-partum FP services (return to fertility).
- Antenatal care card

2. ANTENATAL CARE (IDEAL BUT MAY NOT BE FEASIBLE)

- Urine Analysis (Albumin and Diabetes)
- Hemoglobin/Hemocrit
- Counseling and Testing for HIV

3. COMMUNITY SUPPORT SYSTEMS

- Support outreach services
- Develop transportation systems
- Develop community health savings and loan programs
- Develop community blood donation system
- Minimize harmful practices and encourage beneficial practices

INTERVENTIONS Antenatal

BEST REFERENCES

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Histories

In many settings too much information is collected, making useful analysis and decision-making difficult. Health records need to only collect the essential information required for program planning, management, and decision-making. Appropriate feedback mechanisms need to be established to ensure that the people who collect the information have access to it, understand the results, and can utilize it to inform their decisions.

Pregnancy histories are important. However, this practice as currently undertaken in many countries, often misses important information about past events that could be essential in monitoring the mother and fetus/newborn. The home-based maternity record (HBMR) is one approach for improving continuity of health care by focusing on a woman's reproductive life in a comprehensive manner, rather than on a single pregnancy outcome. The record collects information for all pregnancies and their outcomes, and other major events (e.g., age of menarche, STIs) throughout a woman's life. The HMBR is maintained by the woman and all the services she receives, from different providers or health facilities, are recorded in one place. If a country chose, to develop an HMBR, it should be in the local language and pictorials used if possible[61].

Screening

Although every women needs to be counseled about her potential risk for developing a complication, there are some factors that may indicate higher risk. (Note: there will be a percentage of these women who will deliver without any problem.) As previously discussed, the use of "four toos" is not the most effective in screening women because it classifies a large proportion of pregnant women as being "at risk" (e.g. 50% or more). If all these women sought services the health system would be overwhelmed.

Clear-cut, context-specific parameters for conditions requiring referrals need to be established while encouraging couples to plan their births. Providers need training to understand why these parameters were selected and to improve their diagnostic skills in identifying and managing these complications. Screening parameters will vary somewhat by setting (see Maternal Height Section) but the list presented below is probably a good start in most settings[8, 54].

1. First pregnancy at <15 years or >35 years.
2. First pregnancy with malaria or hypertension.
3. First pregnancy with short stature <145 cm (may vary).
4. Anemia status (hemoglobin less than 11 gm).
5. TT vaccination status.
6. Presence of infectious diseases (e.g., Malaria, STIs).
7. More than 5 pregnancies.
8. Previous poor obstetric history (e.g., vaginal bleeding, infection, pre-eclampsia) or previous C-section.
9. Pregnancies spaced <2 years apart.
10. More than 2 induced abortions.
11. Malpresentations (e.g., breech, or transverse lie).
12. Multiple gestation (e.g., twins, etc.).
13. Lives greater than 10 kms from the health center[62].

Other screening factors to be considered may include: foot size, age, night blindness, HIV status, and unwed mothers without social support.

The literature strongly suggests that any parameter/criteria (e.g., previous obstetric history) that may be used to identify a woman as a high obstetric risk needs to be broad enough to capture the various aspects of "risk" (e.g., social and medical risk).

In Indonesia a combination of parameters in two broad areas, reproductive health markers and assessment of current status, were used to define women who were at risk of developing an obstetric complication. The first area examined was reproductive health markers, including young primigravida (less than 16 years), elderly primagravida (older than 35 years), more than four pregnancies and older than 35, height less than 145cm, and poor obstetric history. The second component was an assessment of current status/complications encompassing bleeding, pre-eclampsia, TT immunization, medical disease (e.g., anemia), and malpresentations.

TABLE 5.7
ANTENATAL RISK SCORING SYSTEM: EAST JAVA

	LOW RISK	HIGH RISK	VERY HIGH RISK
Total Score	2-4	6-10	12+
Color Code	Green	Yellow	Red
ANC	Yes	Yes	Yes
Referral in Pregnancy	No Referral	Midwife, Health Center	Hospital
Site	Mother's home	Home, Health Center	Hospital
Delivery Attendant	TBA or Midwife	Midwife	Doctor

Source: Ministry of Health Indonesia and Mother Care, 1995.

Even with this comprehensive approach, there was no increase in referral to the midwives. The sensitivity and specificity were not high enough to recommend generalized adoption of this scoring system. This example highlights the importance of providing information to all women about danger signs and the need for continuing to study which screening parameters may be most effective[97].

Blood Pressure and Edema

When should blood pressure be monitored? Blood pressure is usually taken to detect the onset of pre-eclampsia or eclampsia (sometimes called toxemia). Women with any history of hypertension should be monitored closely throughout pregnancy. Pre-eclampsia and eclampsia are not well-understood conditions, but they seem to be more prevalent in primigravidas.

Pre-eclampsia is often associated with a rise in diastolic blood pressure (lower number) above 140/90 mmHg, generalized swelling (edema) in the hands and face, protein in the urine, and overactive reflexes. Pre-eclampsia can lead to eclampsia where women have convulsions. However, some women develop eclampsia without having a rise in blood pressure or edema. It is thought that pre-eclampsia rarely happens before the 28th week of gestation and some sources say not before the 32nd week of pregnancy[20, 21, 22].

Research examining the rise in diastolic blood pressure found that there was a 1:3 false positive ratio for women developing pre-eclampsia. This means that if four women had a rise in blood pressure, only one of them would develop pre-eclampsia, while three women would have high blood pressure but would NOT develop the other symptoms of pre-eclampsia[21]. The presence of generalized edema and protein (albumin) in the urine were tested and found to also have poor predictive value with a sensitivity of 49 percent for detecting elevated diastolic BP and 35 percent for identifying eclampsia[21]. This means that half of the women that had edema and protein in their urine also had a rise in blood pressure, while the 51 percent of women who had those symptoms did not experience a rise in blood pressure. Similar findings occurred with eclampsia. Of all the women who had edema and proteinuria only one third (33%) actually developed eclampsia, while the majority of the women (65%)with these symptoms did not develop eclampsia.

Although these screening parameters (rise in BP, generalized edema, proteinuria, and hyperreflexia) are not always able to detect pre-eclampsia or eclampsia, they should be taken seriously and acted upon promptly. **If any of these symptoms are present, women should be encouraged to deliver in a health institution with a skilled provider.**

Planning for childbirth is important because the window of opportunity to treat women and newborns is short.

RECOMMENDATION

WHO recommends that blood pressure be taken monthly in the second and third trimesters. Women need to be closely monitored for generalized swelling in the arms and face (NOT ankles) and for urine protein and patellar reflexes where conditions permit. Treatment includes bed rest in a calm environment and administration of anticonvulsants (e.g., Magnesium Sulfate) and antihypertensives if needed[20, 21, 22].

Birth Planning/Pregnancy Preparedness

As previously discussed, planning for childbirth is important because the window of opportunity to treat women and newborns is short. Reducing the four delays to accessing and receiving services can make the difference between life, illness, and death.

It is important to encourage women and their families to think about the practical aspects of seeking obstetric services prior to an emergency. Many women and their families do not:

1. perceive any risk associated with childbirth;
2. know the danger signs;
3. know where they should go if a problem arises; or
4. know how to get to a health facility.

Reducing the four delays to accessing and receiving services can make the difference between life, illness, and death.

This combination of misinformed beliefs (e.g., swelling is normal), misperceptions about severity, and lack of accurate information significantly contributes to the delay in recognizing the problem. These are the topics that should be included in planning for their birth (See Table 5.8).

TABLE 5.8
KEY ELEMENTS OF BIRTH PLANNING/PREGNANCY PREPAREDNESS

✔ Inform women on what they should expect during pregnancy, including their expected date of delivery and self-care during pregnancy (e.g., nutrition and reduction of worldload).
✔ Know and recognize danger signs for the mother during pregnancy, childbirth, and the post-partum period.
✔ Promote the importance of having a skilled provider attend their delivery.
✔ Know which health facility to go to if a complication arises.
✔ Know how to get to that facility.
✔ Encourage the development of a plan to pay (savings/loan) for those services.
✔ Understand the importance of immediate and exclusive breastfeeding.
✔ Educate women and their families to recognize the danger signs for newborns.
✔ Educate women about their return to fertility and FP options available to them.

Although birth planning can be conducted during antenatal visits, the fact that many women do not receive adequate antenatal care limits its effectiveness. This information can also be shared through informal and formal community groups that have better access to the target population and may better understand their needs. Other community resource persons such as primary school teachers, hair dressers, and religious leaders can be trained to support couples in planning for childbirth and potential complications. The formal health care system can provide reinforcing messages (not conflicting ones) to promote better service utilization. Communities and households need to take responsibility for ensuring that couples prepare for childbirth while reinforcing this practice as a community norm through mobilization and advocacy efforts.

Nutrition

It is estimated that 20 to 45 percent of WRA do not get the WHO recommended 50/kcal/kg a day, let alone the 300 additional calories required during pregnancy[6]. Women are often weighed as an indicator of poor nutritional status and then counseled. Nutritional counseling should be provided to every pregnant woman, regardless of her weight gain.

Adequate nutritional intake is often impossible for women to achieve, due to societal norms, cultural taboos, and lack of food or resources. However, the woman is often labeled as "non-compliant" if she cannot follow the health worker's advice. If the woman cannot afford to eat an adequate diet, then efforts should be made with her family to reduce her (heavy) workload, thereby reducing her energy expenditures.

Appropriate weight gain in pregnancy is critical to newborn outcomes and, to a lesser degree, maternal outcomes. Women who have a low pre-pregnancy weight and insufficient weight gain during pregnancy have the greatest risk of delivering a LBW baby. The combination of reducing energy expenditure and increasing caloric consumption is the most effective strategy for increasing birth weight[21, 26].

In settings where anemia prevalence is high (40% or more), it is more cost-effective to treat all women instead of trying to screen women, because the cost of iron is very low and screening is often not very effective.

Micronutrients such as iron, folic acid, Vitamins A, and iodine are especially important for a healthy pregnancy. **All women should be encouraged to eat as balanced a diet as possible, so they can maintain adequate nutritional stores before they become pregnant.** Table 5.9 presents the recommended micronutrient supplementation dosages if deficiencies exist.

BEST REFERENCES

King, F.S. and Burgess, A. (1993). **Nutrition for Developing Countries (2nd ed)**. Oxford: Oxford University Press.

Baker, J. et al. (1996). **The Time to Act: Women's Nutrition and Its Consequences for Child Survival and Reproductive Health in Africa.** Washington, DC: Academy for Educational Development.

World Health Organization. (1998). **Safe Vitamin A Dosage During Pregnancy and Lactation**. Geneva: World Health Organization.

Iron: ***Maternal anemia (Hb below 11g/dl) affects about 500 million women.*** Iron deficiency diminishes the ability to fight infection and causes anemia. Anemia often has several causes, but the main causes are inadequate diet, low absorption of iron, or iron loss. Other nutrient deficiencies such as folic acid and Vitamins A and C also contribute to anemia. If these nutrients are available in adequate amounts, they enhance iron absorption. In many areas, malaria and hookworm are also major causes of anemia. Treatment programs should also be implemented to address these diseases, thus reducing anemia[20, 24, 25].

In settings where anemia prevalence is high (40% or more), it is more cost-effective to treat all women instead of trying to screen women, because the cost of iron is very low and screening is often not very effective. For example, pallor screening – (examining the inner lower eyelids, conjunctiva, palms and nailbeds for paleness) is useful in detecting severe anemia (hemoglobin less than 7gms). However, studies have found that it is not very effective in identifying mild or moderate anemia. This is important because the treatment regimens are based on the severity of anemia[24].

TABLE 5.9
MICRONUTRIENT SUPPLEMENTATION

MICRONUTRIENT	WRA	ANTENATAL	POST-PARTUM
Iron – Mild Anemia[1] (Hg less 11 gm)	60 mg	60 mg (90-100 tabs)	60 mg
Iron – Moderate/High[1] (Hg range of 7-10 gm)	120 mg	120 mg	120 mg
Iron – Severe[1] (Hg less than 7 gm)	120 mg	180 mg for 4 weeks, then 120 mg	120 mg
Folic Acid Mild Anemia[1]	250 mcg	250 mcg	250 mcg
Folic Acid Moderate/High Anemia[1]	500 mcg	500 mcg	500 mcg
Folic Acid Severe Anemia[1]	500 mcg	750 mcg for 4 weeks then 500 mcg	500 mcg
Vitamin A[2] Deficiency (VAD)	Supplement women w/VAD Not to exceed 10,000 IU daily	Supplementation for women with VAD only Not to exceed 10,000 IUs daily	200,000 IUs single dose first month
Calcium[3] Deficiency	1,200 mg	1,200 mg	1,200 mg
Zinc[3] Deficiency	12 mg	15 mg	19 mg
Iodine[4] Deficiency	400-960 mg	100-300 mg (oil)	100-300 mg (oil)

Source: (1) WHO, 1995; (2), WHO, 1998; (3) MotherCare 1997; (4) WHO, 1996. (IM): intramuscular; (IUs): international units, (MU): million units, (mcg) micrograms; (mg) milligrams
VAD – Vitamin A Deficiency

In many developing country settings, pallor screening may be the only tool available, but its limitations need to be understood. It is essential to identify women with severe anemia to ensure they are referred and properly treated, but it may not be as vital for women with mild anemia.

The literature has debated about giving women weekly iron doses instead of a daily dose to correct anemia. Based on a review of the literature, it would appear to be premature to change existing practices to giving a weekly dose of iron until more research is completed[29].

RECOMMENDATION FOR IRON

It is recommended that all women eat adequate amounts of iron rich foods. Iron is contained in two types of food: heme and non-heme sources. Heme sources provide more iron that is easily digested; good sources are red meat and organ meat. Non-heme do not contain as much iron as heme sources, but if they are combined properly, they can provide sufficient iron. Good non-heme sources include dark green leafy vegetables, molasses, egg yolks, dried fruit, and legumes. Fortification of grains with iron (e.g., cereals, breads) can also be a strategy in some settings.

WHO recommends that all pregnant women receive 60 mg of elemental iron with 250 micrograms of folic acid during the second and third trimesters. If a woman is anemic or lives in an endemic area, then she should take 120 mg of iron a day with folic acid for the same time period[8, 29].

Vitamin A is essential for normal maintenance and functioning of body tissues, for growth and development, and a strong immune system. During pregnancy the fetus makes demands on the mother's Vitamin A stores to receive enough Vitamin A for its own growth. Although the increased Vitamin A requirement during pregnancy is quite small, in countries where Vitamin A deficiency (VAD) is endemic, women need supplementation[60]. **If one percent of the total population of children under 5 years of age is diagnosed with VAD, the prevalence is considered high, indicating a significant problem[60].**

VAD among pregnant women seems to be most prevalent in the third trimester, and it is generally associated with a poor diet, protein energy malnutrition (PEM), anemia, and higher rates of infectious diseases. These women often display varying levels of night blindness (e.g., not being able to see in dim light) which is easy to treat with Vitamin A supplementation.

There is some evidence among HIV-infected pregnant women in Africa that suggests poor Vitamin A status. In Malawi, poor Vitamin A status was associated with an increase in vertical transmission of HIV to their newborns as well as higher infant mortality, LBW, and increased maternal mortality. In Kenya, researchers found that lactating HIV-positive women with severe VAD were more likely to have HIV-infected cells in their breastmilk[60].

These findings are not adequate to establish a causal link between VAD and HIV transmission. Even though it seems plausible, recent results have not indicated that treatment with Vitamin A supplementation would reduce vertical transmission of HIV to newborns. A recent study in Tanzania, where one group of HIV-positive mothers received Vitamin A and the other received a compound of Vitamin B complex, found there was no difference in vertical transmission in the Vitamin A group. There was, however, a reduction in the Vitamin B group[63]. **More research is needed to understand the associations between VAD, HIV transmission, and mortality. These findings do indicate that the presence of VAD increases the possibility of poor maternal and newborn outcomes.**

There are two reasons to give Vitamin A supplementation during pregnancy: 1) to treat VAD; and 2) to reduce maternal and/or neonatal mortality. First and most important is to treat VAD and its related symptoms, such as night blindness, which is well supported by the literature. Second, a few preliminary studies suggest that Vitamin A may significantly reduce maternal and neonatal mortality. Vitamin A supplementation to non-pregnant women has led to increases in hemoglobin and a reduction in infections. This was also found in the Nepal and Indonesia studies that gave Vitamin A supplements to pregnant women.

Vitamin A supplementation during pregnancy has raised concerns because of its potential tetraogenocity (the ability to cause birth defects). Both severe VAD and Vitamin A toxicity can cause birth defects in animals and are associated with adverse reproductive outcomes. However, similar findings have not been well-documented in humans. One study in the U.S. found that women with a total dietary intake of 15,000 IUs or women with an intake of a supplement greater than 10,000 IUs had an increased risk of birth defects. This only seems to be the case where fertile women regularly consume adequate amounts of Vitamin A[36].

In June 1996, WHO convened a meeting on "Safe Vitamin A Dosage During Pregnancy and the First Six Months After Birth." On the basis of available data, the experts determined that there is no tetraogenic risk from performed Vitamin A supplementation of 10,000 IUs daily given to pregnant women suffering from VAD. While a weekly supplement of 25,000 IUs given to women who regularly underconsume Vitamin A is safe, the experts believe that it is inadequate to build requisite maternal stores during pregnancy, thus the recommendation of 10,000 IUs daily. After reviewing the data, the panel concluded that the production of retinoic acid metabolites necessary to produce tetraogenocity does not occur with Vitamin A daily dose levels of 10,000-15,000 IUs. Some birth defects were noted in daily doses at levels of 30,000 IUs or above, especially if the supplementation was given in the first trimester[36].

On the basis of available data, the experts determined that there is no tetraogenic risk from performed Vitamin A supplementation of 10,000 IUs daily given to pregnant women suffering from VAD.

The panel concluded that:

- ➔ in VAD settings it is recommended to provide 10,000 IUs of Vitamin A supplementation in the second or third trimester;
- ➔ in settings where women's intake meets RDA amount (8,000 IUs), there is no justification for a supplement above 8,000 IUs; and
- ➔ in settings where women habitually consume more than the RDA (8,000 IUs), there is no justification for any supplementation. In fact, supplements could be dangerous to this population.

Lastly, the group supported WHO's recommendation that post-partum women receive a single high dose of 200,000 IUs in the first month after delivery to increase maternal and newborn stores[4, 36].

As stated above, one reason to supplement women during pregnancy is to reduce maternal and neonatal mortality. There are a few studies with preliminary data that indicate a significant reduction of maternal and infant mortality (most due to a reduction in anemia and infections, as well as increased birth weight) when low doses of Vitamin A are given to pregnant women in high VAD areas[71, 72]. **While the results of current research look promising for this type of supplementation, further research is needed before programs can proceed on a wide scale.**

RECOMMENDATIONS FOR VITAMIN A

It is recommended that all women eat adequate amounts of Vitamin A rich foods, not too much or too little. Good sources of Vitamin A include dark leafy green vegetables, dark yellow fruits and vegetables such as mango, papaya, pumpkin, ripe squash, carrot, sweet potato, apricot and cantaloupe, as well as margarine, eggs, and other dairy products.

In VAD settings, WHO recommends administration of 10,000 IUs of Vitamin A supplementation to pregnant woman. In non-VAD settings there is no demonstrated benefit of supplementation. **NO PREGNANT WOMAN SHOULD EVER RECEIVE A VITAMIN A SUPPLEMENT OF MORE THAN 10,000 IUs PER DAY[36].**

WHO also recommends that women receive a single dose of 200,000 IUs in order to build maternal and newborn stores of Vitamin A[4,36].

Iodine is needed for adequate physical and mental development of the fetus. Iodine deficiency increases the chances of miscarriage, stillbirth and premature birth. A child born to an iodine-deficient mother is more likely to have mental retardation, cretinism, and poor muscle coordination. **About 250 million women suffer the effects of iodine deficiency and nearly one third of Africans (181 million) live in iodine deficient areas[4].**

Salt iodization is the optimal way of correcting iodine deficiency and it should be the primary focus for preventing and controlling iodine deficiency disorders (IDD). The recommended dietary intake for pregnant and lactating women is 200 mcg/day. In 1996 WHO hosted an expert panel to look at the safety of giving iodine oil to pregnant women that experienced IDD. The conclusions of this panel was that for preventing and controlling moderate and sever IDD, administration of iodized oil is safe at any time during the pregnancy[39] (See Table 5.8 for dosage).

RECOMMENDATION FOR IODINE

It is recommended that all women eat adequate amounts of iodine, which naturally occurs, in ocean fish. Many products (e.g, salt, water) have iodine added in adequate amounts to avoid deficiencies. If iodine deficiency occurs, pregnant women can safely be treated with iodine oil[8, 73].

Overall Micronutrient Programs

In settings were supplementation is needed, the main problems usually occur in two areas: distribution and compliance. In order to improve micronutrient programs, a two-pronged approach is needed – enhancing distribution and access to supplies through the health or private sector systems, and increasing demand and motivation for compliance. Activities may include:

1. working on the logistics system in ordering, storage, distribution and inventory control through the government and/or private sector;
2. expanding access to the supplies and information through community-based distribution (e.g., depot holders, social marketing) and private sector outlets (e.g., pharmacies, hairdressers, tailors);
3. improving providers' attitudes and beliefs about the importance of micronutrient supplementation so that they can empower the women to see the benefits for both themselves and their children; and
4. enhancing women's knowledge so that they understand the importance of those regimens and can take action.

Some foods can be fortified with micronutrients (e.g., iron and iodine). This can be done at the local level, but it is usually more economical if it is done where there is some central processing of a staple food product (e.g., flour mill, oil plants, salt mine). Fortification programs include:

1. adding a micronutrient to a food product;
2. monitoring quality by ensuring that there is a sufficient amount of the micronutrient to maintain requisite blood levels;
3. enacting legislation to support the fortified product; and
4. implementing a health education campaign to raise public awareness about and demand for the product.

Anthropometric Indicators

Anthropometric indicators (weight, height, arm circumference, height for weight, and body mass index) identify women with nutritional problems; however, they may not reveal the causes. The causes may include inadequate energy intake, specific nutrient deficiencies, high energy expenditure, and endemic diseases such as malaria or hookworm. Table 5.10 presents the indicators and their parameters.

Maternal Weight: is probably the easiest and most reliable indicator to monitor during pregnancy. Appropriate weight gain in pregnancy is critical to newborn outcome and, to a lesser degree, maternal outcomes. Women who have a low prepregnancy weight and insufficent weight gain during pregnancy have the greatest risk of delivering a LBW baby.

It is recommended that women gain at least one kg per month in the last two trimesters of pregnancy. However, optimal weight gains vary depending on the woman's nutritional level at the onset of her pregnancy. Women with low prepregnancy weight will need to gain more weight during their pregnancy (sometimes up to 18kg) to offset her risk of delivering a LBW baby[4,22,26,66].

TABLE 5.10
ANTHROPOMETRIC INDICATORS

INDICATOR	MONITORING(1)	CUT-OFF PARAMETER(2)	COMMENTS
Maternal Weight	1 kg per month	N/A	Easy
Maternal Height	N/A	140-150cm	Relatively easy but does not change
Weight for Height	N/A	150cm and 40 kg	More difficult to measure
Arm Circumference	N/A	22.5 cm	Easy, but measurement errors are common and change occurs slowly
Body Mass Index (BMI)	N/A	18.5	Difficult

Source: WHO Bulletin, 1996
(1)**Monitoring:** Indicators collected on a regular basis because they fluctuate over a short period of time.
(2)**Parameters:** Do not change as rapidly but can be useful in determining status and current nutritional risk.

Where feasible, weight gain should be monitored monthly, however in many parts of the developing world this is difficult. Where antenatal care attendance is low but child service attendance is high, programs may be able to obtain prepregnancy weights for women when they bring the children for immunizations. Although this is a more long-term perspective and will have implications on how child services are provided, it may be one approach to identify women who are at nutritional risk. Therefore, interventions should be designed and implemented before the woman becomes pregnant. **Another approach is to take two measurements, one month apart, in the second or third trimester. Studies have found that this has a positive predictive value on pregnancy outcome and may be more feasible than weighing women monthly(66).**

It is recommended that women gain at least one kg per month in the last two trimesters of pregnancy.

If a woman comes in the fifth, sixth or seventh month she should be weighed even if there is no prepregnancy weight. She should be provided information on ways to increase her intake and decrease her workload. If the woman does not come until the eighth or ninth month she should still be weighed and arm circumference should be measured. She should be encouraged to increase her intake and reduce her workload, but nutritional interventions will probably not make a lot of difference at this stage.

RECOMMENDATION FOR WEIGHT GAIN DURING PREGNANCY

WHO recommends that weight gain for women in the developing world be between **5-9 kg (11-20 lbs.)**, or 1 kg every month for the second and third trimester. The most important factors affecting birth outcomes are: 1) prepregnancy weight of the woman; 2) pregnancy weight gain; and 3) workload or energy expenditure(4, 22, 26).

Maternal Height: is commonly used as an indicator for obstructed or prolonged labor, but it is not a good indicator for birth weight. Country-specific maternal height cut-off points need to be established for predicting risk of CPD (Note: the range will probably fall between 140-150 cm), but maternal height cannot be used as a monitoring tool during pregnancy[66].

Arm Circumference: is a very small measurement and does not change rapidly. For example, women may gain several kilograms before there is any change in arm circumference. Measurement errors are fairly common and can skew the data. Arm circumference can be useful to identify malnourished women **(less than 22.5 cm)** who need special attention, but it is not a good monitoring indicator[66]. **Such women should probably be considered at risk of delivering a LBW baby and proper follow-up should be scheduled.**

Maternal Height for Weight: is a more specific indicator and it is often hard to measure in the developing world. It may be useful as a cut-off parameter to identify women who are malnourished, but it is probably not practical to use in many settings unless parameters already exist. For example, **in South Asia it is recommended that if a woman is 140-150 cm and weighs less than 40 kilos, she has a greater risk of delivering a LBW baby[66].**

Body Mass Index: (weight in kgs/height in meters squared) is closely associated with weight for height. It is not practical for field workers in service delivery programs to collect this information because of the complicated mathematical nature of the indicator. It is generally accepted **that a BMI of 18.5 or less indicates chronic energy deficiency of the mother,** however this requires validation against newborn outcomes. It can be useful in identifying women who are malnourished[66].

Screening for Special Diseases

BEST REFERENCES

AIDSCAP (1996): **Control of Sexually Transmitted Infections.** Washington DC: Family Health International.

Sexually Transmitted Infections (STIs)

Every year 333 million people, men and women of reproductive age, acquire a sexually transmitted infections (STI)[27]. Screening for STIs is important to both improve the woman's health and prevent devastating effects on the newborn, including LBW, stillbirth, prematurity, congenital syphilis, eye disorders, HIV, and death.

Services to screen, diagnose, and treat women for STIs during pregnancy are rather weak in most settings. Many of the services for STIs are offered in a different health facility and the antenatal staff may not be trained to provide this service. In addition, women are often asymptomatic which makes diagnosis more difficult, particularly since the developing world has a scarcity of lab facilities.

The Reactive Plasma Reagents (RPR) test has been available for many years, but its use in antenatal clinics is not very widespread. In areas where antenatal attendance is low, this is a difficult service to introduce. This is especially true in settings where the majority of antenatal care services (e.g., satellite clinics) are provided through outreach services or at the health post level. Wherever possible, RPR should be part of the regular antenatal packet of services as well as screening for other STIs. Gonorrhea and chlamydia are also prevalent in many developing countries; thus, screening should also be undertaken. However, it is more difficult to detect these infections since good (rapid) tests to diagnose their presence do not exist[67].

Where lab facilities are not available, the syndromic approach to STI case management can be utilized. This approach involves the detection of a syndrome – signs and symptoms associated with well-defined etiologic agents. It relies on a clinical flowchart (algorithm) to guide step-by-step diagnosis and treatment of the various diseases. The main drawback to this approach is that it is based on symptoms, and many people, especially women, are asymptomatic, making diagnosis difficult. In addition, there is a dearth of lab facilities in many countries. However, in many developing countries this approach may be the best option[67].

Women need information about condom use, especially in high STI prevalent areas, to reduce re-infection rates. Health personnel need to be adequately trained to identify symptoms and to provide appropriate case management. Services need to have sufficient stocks of antibiotics to treat clients. Follow-up and partner notification systems also need to be functional to properly treat both partners, thus reducing reinfection rates.

In many settings, linkages between the antenatal services and other facilities that can provide STI screening and treatment need to be strengthened. Services at the health post level often include education on transmission modes of STIs, ways to protect one's self, identification of symptoms and referral, and the effects of STIs on the newborn. At the health center these services will be supplemented with testing for syphilis, gonorrhea and chlamydia, partner notification, and treatment.

Selection of drug regimens (See Table 5.11) varies somewhat by location and need to be based on:

1. patterns and prevalence of STIs;
2. availability and capacity of the health infrastructure;
3. competency level of the health personnel; and
4. socioeconomic status.

TABLE 5.11
PREFERRED TREATMENT PROTOCOLS FOR PREGNANT WOMEN AND NEWBORNS

DISEASE	CIPROFLOXACIN	CEFTRIAXZONE	PENICILLIN	TETRACYCLINE	DOXYCYCLINE
Maternal Syphilis	NA	NA	2.4 MU IM	NA	NA
Maternal G					
Maternal Ch					po ıy lays
Ophthalmia Neonatorun					
Congenital			of procaine IM		

Table 5.11 is no longer used.

Source: Family Health International, 1996
MU= million units; PO= by mouth; mg= milligram; IM= intramuscular; NA= Not Applicable

HIV

By the end of 1997, there were about 30 million people infected with HIV worldwide. Of these, 45 percent are women, and the largest percentage of new cases are occurring among youth betweeen 15 and 24 years of age. In addition, the majority of these people do not know their HIV status[21]. There are approximately 500,000 infants that are HIV positive, transmitted either perinatally or through breastmilk. Studies indicate that about 30 percent of infants that are born to HIV positive women will become positive themselves after 6 months. **The majority of these infants (20%) are infected during pregnancy or at delivery while about 14 percent of infants are infected through breastfeeding[27, 68].**

There are approximately 500,000 infants that are HIV positive, transmitted either perinatally or through breastmilk.

While voluntary and confidential counseling and testing (VCCT) for HIV is important, especially in high prevalence countries, it is often not feasible. The health system may not be equipped to provide these services and women may not want to know their status. In a country where HIV prevalence is high, such as in Uganda, they may want to counsel and test every pregnant woman. While this would be the goal, it has many implications on the program needs, including the number of personnel required to provide counseling and testing services, the systems needed to ensure adequate amounts of supplies, the demand for accurate information systems to follow-up these women and their partners, as well as the overall cost.

RECOMMENDATION FOR HIV SCREENING DURING PREGNANCY FOR VOLUNTARY COUNSELING AND TESTING

WHO recommends that pregnant women with the characteristics presented below should be offered counseling and testing services.

- Symptoms suggestive of HIV infection: unexplained weight loss, chronic diarrhea, intermittent or persistent fever, persistent cough, swollen glands, oral yeast infection (thrush), night sweats, fatigue and generalized dermatitis.
- History of intravenous drug use.
- Partner or child with HIV-related symptoms or AIDS.
- History or presence of STIs.
- History of exchanging sex for money, goods, drugs, or other favors.
- History of unprotected sex with multiple partners.
- History of bi-sexual sex.
- History of blood transfusion.

Once a pregnant woman learns she is HIV positive, adequate counseling should be provided so that she can make an informed choice regarding continuation of the pregnancy and ways to prevent transmission to others. The necessary referrals should be made so she has social support as well. She should fully understand the risk to her child and should receive information about the risks of HIV transmission through breastfeeding as well as the potential risk of other infant morbidities if breastfeeding is not selected[4].

The joint UNAIDS, UNICEF and WHO policy states that "if a woman is known to be HIV positive, she should be counseled not to breastfeed because of the increased risk of HIV transmission to her child"[68]. However, in many developing countries women do not know their HIV status and do not receive counseling and testing services, so it is difficult to advise them about breastfeeding. In addition, safe alternatives to breastmilk may not be available or affordable in many settings.

Previously, if a pregnant woman was HIV positive there was no intervention available to reduce vertical transmission (MTCT) of HIV to her child. Clinical trials in Thailand and Tanzania have found that Zidovudine (ZDV, also known as ACT) given from 36-40 weeks of pregnancy and during delivery have reduced MTCT by 50 percent[69]. **However there are many implications that need to be considered before implementing this on a wide scale and further research is needed. Each country will have to determine its policy in light of the local setting and new findings.**

First, the regimen requires that women attend antenatal care early so that they can be properly counseled and tested well before the 36th week of gestation, when they will begin the treatment protocol. Second, the regimen is quite rigid with two doses of ZVD (300mg each) a day for four weeks (36th through 40th weeks of gestation) and weekly check-ups. ZDV is also given every three hours from the onset of labor until delivery. One of the reasons it has worked so well in Thailand is due to the high rates of antenatal attendance and institutional deliveries with skilled providers. Although the findings are important, these conditions are not present in many developing country settings and may make implementation difficult[69].

Third, there are ethical concerns with this practice. Are only women who are pregnant going to receive ZDV, when non-pregnant women or men could also benefit from the regimen? Is nothing going to be given to the women once she completes her reproductive function? A case could be made that a woman should receive ZDV during her pregnancy and afterwards, if it would increase her life expectancy, thus being better able to care for the child.

Fourth, the cost is still quite high (between $50 and $100 per course), even with the reductions offered by pharmaceutical companies. A recent cost-effectiveness study compared the cost of a course of ZDV to reduce MTCT to the cost of an averted HIV case. The findings indicate that in settings with high HIV prevalence (above 7%), ZDV could be more cost-effective than some other prevention strategies, however it was not found to be cost-effective in low prevalence settings[70].

RECOMMENDATION

Whenever possible, HIV positive women should be encouraged to deliver in a health institution with a skilled provider. It may be appropriate to have the woman bring gloves to ensure that the baby and the health worker are protected, if gloves are not available in the institution.

If the birth occurs at home the woman and the provider should be educated on how to minimize contact with the mother's blood. The health providers should use gloves, cover any open sores, wash their hands immediately before and after contact with blood or body fluids and ideally mechanical suction should replace mouth-to-mouth suction[8].

Linen soaked with blood or other body fluids needs to be washed in hot water and soap. Solid waste, such as blood soaked dressings and the placenta, should be burned or buried in places that will not be exposed[8].

Malaria

Malaria weakens women's nutritional status and destroys red blood cells, resulting in severe anemia. Resistance to malaria, developed during childhood, begins to break down around a woman's 14th week of pregnancy, and is most pronounced in the first and, to a lesser degree, second pregnancies[4,20].

In Africa, about 22 million pregnant women live in areas where malaria is endemic and the vast majority of these areas are resistant to choloroquine. Malaria is believed to contribute to 5-10 percent of infant deaths associated with LBW. In East Africa, studies have found that Sulfadoxine-pyrimethamine (SP) (e.g., Fansidar, Co-trimoxazole) is effective in treating pregnant women with increases in maternal hemoglobin levels and birth weights[71].

One dose in the second trimester and another in the third trimester significantly increased hemoglobin as well as birth weights. However, HIV positive women need at least three doses for the drug to be effective. This regimen (SP) was also found to be highly cost-effective[71].

For programmatic reasons, several MOH (e.g., Malawi and Kenya) have changed their policies to state that all pregnant women should receive one dose a month, to ensure that they get an effective dose that will attack placental malaria, which is the main cause of LBW. Some Ministries of Health have had a hard time developing policies that state malaria treatment should only be for the first and second pregnancies because they do not want to treat women differently based on their parity.

GUIDANCE

There appears to be consensus that pregnant women, in endemic areas, should be treated for malaria. In chloroquine-resistant areas, studies have shown that SP is safe and effective when given in appropriate doses to pregnant women. However, each setting is unique and the specific malarial regimen for pregnant women should be based on the type of malaria, resistance levels, government policy, and drug sensitivity and availability[71].

Viral Hepatitis

This is a major cause of death among pregnant women in Nigeria, Malawi, Senegal, Ethiopia, and India. The condition should be monitored closely in these countries. It often occurs more among malnourished women. Unfortunately there is no real treatment for infected women, but **newborns should be immunized with Hepatitis B as soon as possible after birth.**

Hookworms

These worms burrow through the skin, mostly through the feet, or can be ingested through contaminated water. They attach to the intestinal lining and cause extensive bleeding, resulting in severe anemia. Hookworm infections occur predominately in the rural areas where agriculture is the main livelihood. Although sanitation alone will control hookworm infections, it takes a long time to see results from this intervention. A hookworm outbreak can be quickly brought under control by mass treatment of people in a heavily affected area[20, 72].

Systemic changes in communities associated with improvements in living conditions seem to have the most positive effects, such as improved sanitation, use of latrines, piped water supply, and effective drainage. House design may be very important, in terms of location of water source in relation to the latrines and animal shelters. Greater prosperity is also associated with a decline in natural manures and an increase in chemical fertilizers.

RECOMMENDATION

WHO recommends that pregnant women be treated for hookworm with one dose of oral antihelmintic (e.g., mebendazole or pyrantel) in areas where infections are endemic (20 – 30% prevalence). Antihelmintics can be safely given to pregnant women AFTER the first trimester. The best approach to reduce hookworm infection in a community is to have a combination of regular treatment, improved sanitation practices, and health education[20, 72].

V. CHILDBIRTH

As stated previously in this chapter, once a woman is pregnant and experiences a complication there are four main delays that contribute to and/or cause maternal and newborn mortality, oftentimes increasing the severity of morbidity:

- ➔ ***Delay #1: Delays in problem recognition;***
- ➔ ***Delay #2: Delays in deciding to seek care;***
- ➔ ***Delay #3: Delays in reaching the health facility; and***
- ➔ ***Delay #4: Delays in receiving treatment at the health facility[14].***

STRATEGIES Normal Deliveries

Program planners and implementers need to strike a balance between improving care for normal deliveries and for complicated deliveries. Strengthening the capacity of those who traditionally attend normal deliveries may help them identify danger signs and refer[13].

Normal Deliveries

Pregnancy is a special time, regardless of whether the woman has a normal or complicated delivery. Family members and the health personnel should support the woman in this process and only intervene when necessary. All women are entitled to a clean delivery (regardless of whether it is in the home or an institution, support from their family, and assistance from a skilled provider). Studies show that improving aseptic practices of providers significantly reduces both maternal and newborn infections. At home, the focus should be on the six cleans, while in the institutions the emphasis needs to be on adequate infection prevention practices as well as newborn care which is discussed later. Strategies will vary depending on the place of delivery and type of assistance available during childbirth.

All women are entitled to a clean delivery (regardless of whether it is in the home or an institution, support from their family; and assistance from a skilled provider.

Complicated Deliveries

Delay #1: Problem Recognition

While information on danger signs is important, the ultimate goal is to foster the adoption of healthy behaviors by women, households, communities, health personnel and institutions. Behavior change is a complex and evolutionary process. Communication strategies need to provide information to women on the recognition of danger signs, where women can go to receive services and how they can reach the health facility in time to have a favorable outcome.

Reinforcing messages need to be targeted towards household decision-makers, the community in general and health providers, so that they can support women to adopt these healthy practices and seek services in a timely manner (See Health Education Section).

Delay #2: Decision-Making

Decision-making involves a set of complex processes with many approvals required by various people before action can be taken. In many cultures women have a limited ability, if any, to influence the decision-making processes that influence health-seeking behaviors. Strategies to increase women's involvement in decision-making include promoting couple communication, fostering girls' and women's education, and training on negotiation skills.

Delay #3: Getting to the Health Facility

Community systems that support access to maternal health services need to be location specific and deal with the constraints that reduce access to health care services in that locale. There are three main barriers to accessing health services:

1. poor communication;
2. poor infrastructure/lack of transportation; and
3. lack of resources.

The solution to these barriers will vary greatly depending on the setting. For example, in one place communication may be the solution to lack of transportation or in another setting resources may be the way to access transportation. It is clear that unless the community is involved in defining the problems and solutions, the system(s) will not be successful.

Delay #4: Receiving Quality Treatment

As previously stated, improving access to quality maternal health services needs to be a comprehensive effort. There are many interdependent components that need to be functioning, simultaneously, to provide quality services. The health system may:

1. have inadequate numbers of health facilities to provide services according to international recommendations;
2. have adequate numbers of facilities and staff but they are poorly distributed, leaving segments of the population underserved; or
3. have adequate numbers of facilities that are insufficiently staffed or equipped to provide quality services (See Table 5.12 for recommended services and number of facilities).

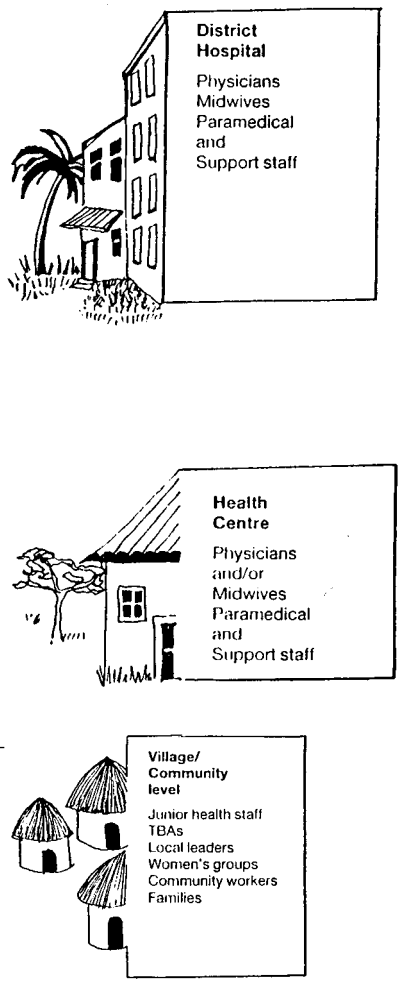
Strategies to improve the quality of obstetric services include:

1. enhancing the clinical and interpersonal skills of the health personnel;
2. strengthening the management and information systems;
3. improving the drug logistics system; and
4. upgrading the physical infrastructure of the health institutions (See Improving Services Section).

TABLE 5.12

Comprehensive Emergency Obstetric Care Facilities **One Facility per 500,000 people**
♦ Perform surgery under general anesthesia. ♦ Perform assisted removal (e.g., D&C) of retained placental pieces. ♦ Perform manual removal of retained placental pieces. ♦ Perform assisted vaginal delivery (e.g., vacuum extraction or forceps delivery). ♦ Provide blood replacement. ♦ Administer parenteral (IV or IM) antibiotics. ♦ Administer parenteral (IV or IM) sedatives. ♦ Administer parenteral (IV or IM) oxytocics.
Basic Emergency Obstetric Care Facilities **Four Facilities per 500,000 people**
♦ Perform manual removal of retained placental. ♦ Perform assisted vaginal delivery (e.g., vacuum extraction). ♦ Administer antibiotics, sedatives (Valium, Magnesium Sulfate) and oxytocics (Ergometrine, Pitocin) IM or IV and IV fluids.
Obstetric First Aid in the Community
♦ Uterine massage/pressure points. ♦ May be able to administer sub-lingual/nasal/IM oxtyocics (Ergometrine). ♦ Provide Oral Rehydration Salts.

Source: Feuerstein, 1993



One approach is a regular case review of maternal deaths, "near-misses" (women who almost died), and newborn deaths. (Note: For every maternal death there are about forty "near misses"). Use of medical audits, or case reviews, can be an effective strategy to assess performance and ensure improvement of obstetric complications. However, for them to be effective, they need to be done in a "learning spirit to improve care" and not a blaming, judgmental environment.

TABLE 5.13

Current Best Practices
CHILDBIRTH/MANAGEMENT OF PREGNANCY OUTCOME

NORMAL HOME DELIVERY

- ➔ Use of skilled provider/clean delivery practices (6 cleans)
- ➔ Minimize harmful practices and encourage beneficial practices
- ➔ Immediate breastfeeding*
- ➔ Adequate newborn care (breathing, warm, dry, cord care and eye care)

COMPLICATED DELIVERIES

- ➔ Minimize harmful practices and encourage beneficial practices
- ➔ Timely identification of complications (bleeding, fever, labor longer than 8 hours, generalized swelling, fever) and promptly seeking care
- ➔ Prompt mobilization of resources (e.g., money, transportation, and blood donation)
- ➔ Obstetric first aid in the community (e.g., bi-manual compression, ORS, nasal/sub-lingual oxtoycics)
- ➔ Existence of functional EOC services (e.g., adequate drugs, medical supplies, equipment, trained personnel, MIS system, and supervision)

  Basic obstetrical services (Health Centers)
  - ✔ IV Fluids, antibiotics, anticonvulsants, oxytocics
  - ✔ Manual removal of retained placenta/pieces
  - ✔ Assisted vaginal deliveries (e.g., forceps)

  Comprehensive obstetric services (Including Basic Hospitals)
  - ✔ Blood transfusion
  - ✔ Surgery/anesthesia (e.g., D&C or C-Section)

- ➔ Access to quality EOC Services
  - ✔ Informed choice about all procedures/treatments
  - ✔ Privacy during examination, ideally by a female provider
  - ✔ Treated within at least one hour of admission
  - ✔ Women Friendly Centers with services available 24 hours a day
  - ✔ Referral and follow-up of women with complications after discharge.

- ➔ Immediate Breastfeeding
- ➔ Adequate newborn care (e.g., breathing, warm, dry, cord care, and eye care)

* Women who know they are HIV positive should be counseled about the potential risk of transmission through breastmilk and decide if they want to breastfeed and look for appropriate alternatives, if needed.

INTERVENTIONS Childbirth

This section is divided into two parts: normal deliveries and complicated deliveries. Table 5.13 describes the best practices for interventions in both areas during childbirth.

Normal Deliveries

Childbirth encompasses three stages of labor, including the delivery of the afterbirth.

First Stage Signs of the start of labor are regular contractions, effacement and/or dilation of the cervix, leakage of amniotic fluid and a bloody discharge. Rupture of membranes is usually a sign that the birth process has begun. A partograph can help a midwife assess progress of labor and identify when intervention is necessary.

Second Stage This stage usually lasts about an hour, but there is no fixed time limit. The beginning of this stage is not always easy to identify, but is usually marked by the following: the women feels the urge to bear down, usually there is full dilation of the cervix.

Third Stage This is the stage that the placenta separates. The chief risks are uterine atony (soft, not contracting) and retained placenta, which leads to post-partum hemorrhage (blood loss of more than 500 ml). "Active" management of this stage of labor includes oxytocin administration, early cord clamping/cutting and controlled cord traction. WHO is currently coordinating trials to assess the advantages of oxytocin injections versus oral administration of prostaglandin. The latter can be done by low-level health workers[98].

During delivery the woman should have family members present that can provide psychological and some physical support. Preferably the woman should have a skilled provider attending the delivery but in many developing countries that is not yet feasible. Practices that speed up the progress of labor should only be done by skilled personnel with proper monitoring. In some settings teas are given that have naturally occurring oxytocics which could jeopardize the outcome of the delivery. In many countries harsh practices such as hard abdominal massage, vigorously turning or pulling the baby, and encouraging the woman to push before she is fully dilated, places both the woman and the newborn in danger.

Clean births affect both maternal and newborn outcomes. All women are entitled to a clean delivery, regardless of whether it is in the home or an institution (See Table 5.14). Traditional practices that introduce any materials into the vagina should be discouraged. Proper hand washing, use of gloves, and proper sterilization of instruments and equipment is needed in all health institutions. Distribution of safe birth kits can be done through the health centers, community groups, or through social marketing. The most important part of this process is to build these practices so that women will deliver in a clean environment and ultimately will be responsible for obtaining these materials on their own to ensure a clean birth.

All women should be encouraged to deliver with a skilled provider (e.g. nurse, midwife, or doctor), either at home or in a health facility.

TABLE 5.14
ELEMENTS OF A CLEAN BIRTH: THE SIX CLEANS

✔ Clean surface
✔ Clean string to tie the cord
✔ Attendant with clean hands
✔ Clean blade to cut the cord
✔ Clean cloth to wrap the baby in
✔ Clean cloth for the mother

Source: WHO, 1996

All women should be encouraged to deliver with a skilled provider (e.g. nurse, midwife, or doctor), either at home or in a health facility. Breastfeeding and newborn care are discussed in the following section.

Complicated Deliveries

The four delays, discussed earlier, occur whether the complication arises during childbirth or the post-partum period; this the interventions would be similar (See Table 5.13). To avoid duplication of this discussion, the delays will be discussed in this section. The delays also impact newborn health seeking behaviors that will be discussed in the newborn section.

Delay #1: Problem Identification: Possible interventions to address delays in problem recognition.

Many men and women consider not only pregnancy outcomes, but also morbidity and mortality from pregnancy-related complications, to be normal or the will of God. These beliefs need to be discussed with men and women to understand their origins. In this process the community members can discuss their beliefs while health workers share with them actions they can take so their wives, daughters, and newborns survive.

As described in the Health Education Section, in order to influence behavior change, communication strategies need to understand and reflect the beliefs, attitudes, and practices of the target audience. A crossection of women, key decision makers (e.g., husbands, mothers), community leaders, and other influentials (e.g., TBAs) specific to the local context need to be involved and targeted with appropriate messages to create a supportive environment for women to access care.

Delay #2: Decision-Making: Possible interventions to address delays in deciding to seek care.

There are many reasons why people delay making decisions to seek care. Some are societal or traditional, such as the value of women within the society or beliefs in traditional medicine. Other reasons are economic, such as the lack of resources to pay for transportation or services. Lastly, in many settings even if a TBA or a health provider suggests that a woman be referred, the family often refuses because they do not trust the health facilities or personnel to provide good services.

Interventions to address the delays in decision-making need to be two-fold, to: 1) enhance women's ability to participate in the decision-making processes; and 2) create a supportive environment to decide to seek care by current decision makers.

Since other household members are key in the decision-making process, which varies greatly by area, it is essential that they be targeted with information. The messages need to focus on recognizing danger signs, understanding the importance of acting quickly, knowing how to get to the health facility, and having resources to pay for services. Knowledge is important but not enough; steps need to be articulated in advance to assure that an emergency action plan can be activited quickly if needed.

Direct interventions to empower women may include training in couple communication, negotiating skills, advocacy, leadership, and strengthening of women's groups.

The importance of men's role in the community needs to be recognized. Efforts to utilize existing men's groups in the community can be an effective strategy to disseminate information. However, programs need to ensure that men are fully involved in the overall community "education and empowerment process." Depending on the context, issues to be discussed with men may include:

1. who will accompany the woman to the health facility;
2. who will take care of the children while the women is in labor and if she needs to go to the hospital;
3. will they allow the woman to receive services if there is only a male provider available; and
4. will they allow the woman to travel if they are not home at the time.

Interventions that support the establishment or strengthening of an existing health network are beneficial because they provide a forum to discuss issues, advocate change, and enhance the effectiveness of the referral system between the community and the facilities. Improving linkages among the health workers, the community leaders, TBAs, village doctors, and the private sector can encourage health-seeking practices. This may be facilitated through: 1) regular meetings of a health committee; 2) use of health personnel in TBAs and CHW training; 3) TBAs, family members and/or pregnant women getting a tour of the hospital before delivery; and 4) development of an action plan that articulates roles and contributions of various parties. In addition, many of the community's birth practices are not harmful (e.g., squatting position for delivery) and they could be encouraged in the health institutions, thus enhancing trust and possibly promoting use of such services.

LIFE IN THE VILLAGE

One of the village leaders had a beautiful daughter. During childbirth, the daughter had labor pains for almost a day, but no one was worried because they thought this was normal. After a few more hours they called the village doctor, but he couldn't relieve her pain. Finally the father decided to take his daughter to the hospital. He had a hard time finding a rickshaw driver who would take her. After a long journey they arrived at the hospital, but the baby was stillborn. The daughter's uterus ruptured and she had to have a hysterectomy. Now her husband has taken a second wife and she is a social outcast because she is infertile. This man, with CARE assistance, has spearheaded a community transportation fund – all the village leaders have donated their own money – and a standing committee to escort women to the hospital.This community has decided to take action to make sure this does not happen to any other woman in their community. The man says that if he had known, he would have gone to the hospital sooner.

CARE Bangladesh Safe Motherhood Project

Delay #3: Access – Possible interventions to reduce delays in reaching the health facility.

Getting women to the nearest appropriate referral site is an arduous task in many countries. Women often need to take several different modes of transport to reach the health facility. Many villages do not have adequate systems to obtain transportation, pay for these services, or inform the health personnel that there is a problem. Transport workers often refuse to take women and if they do agree they charge exorbitant fares. Delays can occur at any or all of these junctions. Presented below are some potential interventions to address these delays.

- ➔ Improve communications and relationships among families, the community, and health workers.
- ➔ Improve the ability of families to pay for services through individual savings and low-cost community loans.
- ➔ Improve the transportation systems by working with the local communities. Transportation needs to be affordable and available 24 hours a day. Transportation workers need to know the location of an appropriate health care facility.
- ➔ Train TBAs and community members in obstetric first aid in order to stabilize the woman until she can get medical care.
- ➔ Reduce the need for emergency transportation systems by developing maternity waiting homes.
- ➔ Improve community's knowledge regarding the nearest appropriate health facilities and how to access their services.

LESSONS LEARNED IN COMMUNICATION/ TRANSPORTATION SYSTEMS

While trying to improve communications in Sierra Leone, the PMM Network initially used motorbikes to summon the ambulance, but discontinued the practice due to high accident rates and maintenance costs. A radio system proved more reliable, efficient and less expensive[54]*. In the Gambia, ambulances were made available at key villages and animal drawn carts or boats were used to evacuate women from those villages to a place where they could get motorized transport*[74]*.*

Elements of Communication/Transportation Systems. In each setting the communication and transportation needs will vary, however, some common principles that must be in place to ensure access to obstetric services are presented below.

1. They must be easily accessible (e.g., community knows where to find them) to the community that plans to use them.
2. They must be affordable, in local terms, to ensure use.
3. They must be safe (e.g., public transportation at night might not be a good option).
4. They must be reliable (e.g., cars need to be maintained to not break down).
5. They must be adaptable in order to deal with seasonal variations (e.g., monsoons).
6. They must be efficient (e.g., know which health facility to go to and the fastest way to get there).
7. They must be culturally appropriate, (e.g., women are willing to go in the mode of transportation selected).
8. They must be technologically appropriate (e.g., ox carts, canoes) so that they can be properly maintained.
9. They must be endorsed by the community and transport workers.
10. They must be available 24 hours a day.

Maternity Waiting Homes

The concept of bringing high risk women to wait at a place near the health facility in order to ensure timely access to appropriate services began as a way to reduce the need for emergency transportation. Maternal waiting homes, typically huts, have been implemented in several countries with varying degrees of success. One problem is that the selection of the women is based on risk and, as we have previously stated, complications cannot be predicted. Other issues to be considered include community involvement and support, relationship with the health facility, cost (monetary and opportunity) for the woman and her family, cost of maintaining the facility, relationship with the family, and appropriate services for the woman, such as cooking, laundry, and room for family members to stay.

LESSONS LEARNED IN MATERNITY WAITING HOMES

In Ethiopia, a women's group was involved in planning and supporting the home, while the community donated construction materials. There was substantial utilization of this facility, resulting in improved maternal outcomes[75].

These waiting homes are most successful when they are maintained by the community, meet the personal needs of the women, and are closely linked with the health institutions. One idea may be to use these maternity homes for both before delivery and post-partum care. Hospitals are often overburdened so women are discharged early. However, if a facility was available near the hospital where both post-partum women and newborns could be more closely monitored for a day or two, it would provide a feasible alternative.

Resource Constraints: In many countries, health services are supposed to be free, but there are many associated costs (e.g., transportation, drugs, supplies, food, etc.) for obtaining these services. The cost, coupled with the fact that most families do not have liquid assets or money put aside for emergencies, directly contributes to delays in deciding to seek care and thus obtaining services. In many settings families must sell their livestock, jewelry, and other valuables, or acquire loans with huge interest rates in order to obtain the necessary funds to pay for obstetric services. Birth planning is one way to address this lack of available resources at the time of delivery. Another approach may be to develop a community fund, which makes available either a donation or loan to the community specifically for this purpose.

The principle of obstetric first aid is to provide immediate measures that can stabilize the woman and not inflict harm.

Obstetric First Aid: Significant delays occur from the time when a problem is recognized, a decision is reached to seek services, transportation is obtained, and care is actually received. During this period a woman can seriously deteriorate if some simple measures are not employed. The principle of obstetric first aid is to provide immediate measures that can stabilize the woman and not inflict harm[77]. Table 5.15 describes actions that a family member or a TBA can be trained to perform in the community to stabilize the woman while mobilizing and carrying out the referral.

Emergency measures (See Table 5.15) can help save a women's life if, **at the same time,** action is taken to call for help and arrange tranportation to a health facility that can manage obstetric complications. In general, women need to be: 1) kept warm; 2) provided with oral rehydration if conscious; and 3) encouraged to empty their bladder if possible. Obstetric First Aid (OFA) includes:

1. **to reduce or stop bleeding** apply uterine massage (not hard) or bi-manual compression;
2. **in case of convulsions** take measures to prevent the woman from hurting herself before anticonvulsants are administered; and
3. **in case of fever or rupture of membranes** administer antibiotics and antipyretics orally, as a temporary measure before being transferred[98].


LESSONS LEARNED ABOUT EMERGENCY FUNDS IN THE COMMUNITY

In Ekpoma, Nigeria, *paying for obstetric services was a serious problem. Through negotiation with the communities, 13 loan funds were started. The initial contribution came from the PMM members, and then the clan members donated funds. The loan fund was under the control of the clan treasurer. Any woman in need of assistance for pregnancy or delivery-related problems could apply for a loan. The family was expected to pay back the amount borrowed with two percent interest. The total amount of the loan fund after one year (for all 13 clans) was $793 and the typical loan requested was $7 to $15. In one year, 456 persons applied for assistance. Of these, 380 were approved and 96 percent were repaid*[76].

In Burundi, *the Safe Home Delivery Assistance project encourages families with pregnant women to purchase home birth kits at a price which is one-third of the market value. Health centers sell the birth kits only to women who attend prenatal care, or to those with low risk factors. Revenues from the sales are used by the health centers to send women with complications to the referral center. Prenatal attendance has increased by 50 percent and institutional deliveries rose by ten percent.*

Save the Mother's Fund, *The International Federation of Obstetricians and Gynecologists in partnership with UNFPA, with possible support of Pharmacia and Upjohn, Inc., has launched a Save the Mothers Fund project. Teams of obstetricians/gynecologists from developed countries will work with their counterparts in developing countries to launch demonstration projects in Uganda, Pakistan, and Nepal. This partnership provides a forum for a powerful and strategic force for improving women's access to obstretric services.*


TABLE 5.15
EMERGENCY!!! WHAT CAN THE TRAINED TBA DO?

DURING PREGNANCY	
Vaginal bleeding	✔ Encourage the woman to consult with a doctor ✔ Explain to the family why the woman should avoid heavy manual work
Swelling of face and hands	✔ Encourage the woman to consult with a doctor ✔ Explain to the husband why the woman must rest
No antenatal care and baby is breech or transverse between 34-40 weeks	✔ Urge women to deliver in the hospital ✔ Explain to the husband why they should deliver in the hospital
DURING LABOR AND DELIVERY	
Labor for more than 12 hours	✔ Assist family to arrange rapid referral ✔ Keep woman warm, drinking clear liquids
Cord tightly around baby's neck	✔ Gently slip cord over baby's head to avoid cord compression but do not force
Vaginal laceration	✔ For a small tear use clean cloths to apply pressure and stop bleeding ✔ For deeper tear or when bleeding does not stop, apply pressure with clean cloths and accompany family to health facility
AFTER DELIVERY	
Baby depressed	✔ Keep the baby dry and warm ✔ Remove secretions from the mouth ✔ Stimulate baby ✔ Mouth-to mouth resuscitation, if needed
Placenta not delivered in 30 minutes	✔ Urge woman to pass urine ✔ Check contraction (firmness) of uterus ✔ Put baby to breast to suckle ✔ If bleeding persists, help family to refer woman to hospital
Heavy vaginal bleeding after contract	✔ Rub the woman's abdomen to help the uterus (NOT HARD) ✔ Assist family to refer woman right away ✔ Keep woman warm and drinking clear liquids (ORS) ✔ Give oxytocics if trained and available
Fever, blood-stained vaginal discharge	✔ Give antibiotics to the woman ✔ Explain about cleanliness of genital area ✔ Explain danger of infection spreading to woman's bloodstream without treatment

Source: Feuerstein, 1995

Delay #4: Receiving Quality Care: Possible interventions to reduce delays in receiving quality treatment at the health facility.

- ➔ Train midwives and doctors, especially female doctors where available, in life-saving skills.
- ➔ Enhance support systems to monitor quality and reduce cumbersome administrative processes that prolong waiting time, especially for blood replacement.
- ➔ Establish and/or strengthen a continuous monitoring system that can review cases in terms of appropriate medical management.
- ➔ Establish a kiosk on the hospital grounds that is well-stocked, where families can buy needed materials (all in one package) at an affordable price.
- ➔ Work to ensure that equipment is functional, proper infection control practices are utilized and an inventory control system is in place to maintain a sufficient stock of drugs and medical supplies on a regular basis.
- ➔ Work to ensure that services are provided on a 24-hour basis.
- ➔ Promote "Mother Friendly" environments in health institutions.
- ➔ Work to ensure that key support systems are useful and operational, such as management information systems for referrals and follow-up.
- ➔ Monitor key factors such as waiting time, CFR, and perceptions of women admitted to the facilities, as indictors of quality.
- ➔ Involve the guards and receptionists so that people are not locked out of the hospital grounds, particularly at night.

Case reviews that allow a safe environment to discuss all the factors that are related to the death or "near miss" (women who survived but almost died) can be a useful process. These reviews may be able to identify a particular area where most of the women are coming from and further investigation can be conducted. It may indicate that women are arriving too late to be treated and discussions can be held with the community to assess what barriers exist to having the woman arrive earlier. The reviews may also identify inappropriate management of complications that needs to be corrected by training and/or supervision (See Improving Services and Human Resource Development sections).

Facilities may also want to monitor the CFR because it is a useful indicator of quality of care and reflects factors such as:

- ➔ the severity of the woman's condition upon admission;
- ➔ waiting time;
- ➔ workload and competency of the providers;
- ➔ availability of medicines, equipment, and supplies; and
- ➔ administrative systems.

The CFR and the case reviews assist in identifying weak areas in the system that need to be addressed. Once these weaknesses are identified, then appropriate interventions can be selected and implemented to address these areas.

VI. MATERNAL POST-PARTUM

As previously stated, the delays are also very applicable to this time period, but since they have already been discussed they will not be repeated in this section. This section is organized into three components: normal post-partum, post-abortion care, and complicated post-partum. Tables 5.14, 5.15, and 5.16 describe the Current Best Practices and interventions that may be used for each of these components.

Referring back to Chapter 1 you will recall that the majority of deaths occur during the post-partum period. Unfortunately little has been done in the immediate post-partum period (first 24 hours). **Post-partum programs should be developed to monitor women and newborns in the first 24 hours after delivery. Women who have experienced complications and deliver in a health facility should stay at least 24 hours to ensure adequate health of the mother and newborn.**

STRATEGIES Maternal Post-Partum

We are still learning how to implement post-partum programs, which have traditionally been neglected. As a result, this intervention section is not as detailed as the author would like due to the dearth of programs.

Strategies for reaching women during the first 24 hours after delivery will vary depending on the place of delivery. It will be much easier to monitor the woman and the newborn if she delivers in an institution. However, in many places these services need to be greatly improved. In a setting where the majority of births occur at home, there is a greater reliance on the community's ability to detect the danger signs and make a referral to a health facility. This is especially important in societies that keep the woman secluded for the first forty days of her post-partum period.

This can be done through the formal health system or by utilizing community resources such as village health workers or primary school teachers. These resource people have access to women and newborns and must be able to identify the danger signs described throughout this manual (See Table 5.16).

Strategies to improve post-abortion care include the enhancement of referrals to appropriate facilities that can either provide quality abortion services or manage complications. In addition, family planning, information, and services are needed to prevent repeat pregnancy since the woman's fertility returns immediately after an abortion.

INTERVENTIONS Maternal Post-Partum

Normal Post-Partum

Post-partum care should include an assessment of the mother and the newborn. (Newborn care is presented in the next section). Maternal care should include: assessment of the fundus level, bleeding patterns and type and amount of discharge; identification of maternal and/or newborn complications; nutrition counseling; information about return to fertility and family planning options; assistance with newborn care, cord care, the importance of exclusive and frequent breastfeeding; and the need for, and timing of, immunizations.

Each setting will need to determine who the most appropriate resource persons, (e.g., health worker, primary school teachers, TBAs, or traditional healer) are to reach these women. Interventions should foster collaboration between the selected resource person in the community and the health workers to facilitate an effective referral system.

Exclusive and frequent breastfeeding can result in lactation amenorrhea that is a means of fertility regulation for many women. This can be an effective FP method if women are properly counseled about their ovulation and return to fertility.

The recommended schedule for post-partum visits as outlined in ACNM's "Healthy Mothers, Healthy Newborns" are:

1. first visit six hours after birth;
2. second visit 3 days after birth;
3. third visit 14 days after birth; and
4. fourth visit 40 days after birth[62].

However, this may not be feasible. It is important that the woman receives services in the first 24 hours to address post-partum hemorrhage and then three to five days after delivery to identify infections and sepsis.

TABLE 5.16

Current Best Practices
POST-PARTUM MATERNAL

Normal Maternal

➔ Monitor mother and newborn

IDEAL		RECOMMENDED	
First Visit	**First 6 hours**	**First Visit**	**In first 24 hours**
Second Vsiit	**3 days after birth**	**Second Visit**	**3 to 5 days after birth**
Third Visit	**14 days after birth**	**Third Visit**	**40th day after birth**
Fourth Visit	**40th day after birth**		

➔ Minimize harmful practices and encourage beneficial practices.
➔ Post-partum Vitamin A Supplementation (200,000 IUs) in the first month.
➔ Post-partum FP (mini-pill, IUD, VSC immediately, other after 6 weeks).
➔ Breast care

DANGER SIGNS TO BE MONITORED

➔ **Post-partum Hemorrhage**
- ✔ Heavy bleeding (e.g., soaking one pad/cloth every hour in the first 8 hours, soaking 1 pad/cloth every 2 hours in second 8 hours)
- ✔ Shock (e.g., sweating, cool, clammy, fainting, rapid weak pulse)
- ✔ Atonic (Soft) uterus
- ✔ Tears/laceration

➔ **Retained Placenta**
- ✔ No sign of placental separation (lengthening of the cord, gush of blood) within 15 minutes after delivery
- ✔ Placenta not delivered within 30 minutes after delivery
- ✔ Atonic uterus/heavy bleeding

➔ **Sepsis**
- ✔ Fever with or without chills (3-5 days usually)
- ✔ Foul smelling/change in discharge
- ✔ Uterus tenderness/atonic uterus
- ✔ Convulsions/ridgity

➔ **Eclampsia**
- ✔ Facial and/or hand edema (not swelling of ankles)
- ✔ Elevated blood pressure
- ✔ Headache, visual disturbances, delirium convulsions
- ✔ Decreased urine output

Complicated Maternal

➔ Access to EOC services (treatment of complications and infections, and morbidities such as fistula, uterine prolapse and lacerations).
➔ Minimize harmful practices and encourage beneficial practices.

Post-Abortion Care

As stated previously, about 20 million women every year have unsafe (induced) abortions and at least 20 percent of them require medical care to treat complications[1]. Women need to have access to quality emergency services, family planning information, and services to prevent repeat pregnancies. Several donors provide training in abortion services (e.g., UNFPA, SIDA). Other donors such as USAID do **NOT** provide support for abortion services. They do support services to treat abortion complications (post-abortion care). CARE also does not support abortion services. **However, we do understand the seriousness of unsafe abortions and its consequences resulting in millions of deaths and injuries to women around the world every year. Therefore, we support post-abortion care services that provide treatment of abortion complications and promote post-abortion family planning information and services.**

Women often do not receive medical treatment soon enough for abortion complications and these delays put their lives at risk.

Post-abortion care (PAC) services include three components:

Prompt emergency care to treat complications;

Appropriate care to treat complications; and

Comprehensive services, including access to other reproductive health services, especially family planning [19, 78].

Since abortion is a sensitive issue in many settings, programs need to start where opportunities present themselves in order to be successful within that context. PAC services do not have to be provided in the order presented below.

Prompt Emergency Care: Women often do not receive medical treatment soon enough for abortion complications, and these delays put their lives at risk. Decentralizing emergency care can reduce delays by offering PAC services closer to where women live. At the same time, the formal referral system needs to be strengthened in many settings to help each woman quickly obtain requisite services to prevent mortality and morbidity.

Appropriate Care: Most women seeking emergency care suffer from incomplete abortion, which if left untreated, can lead to hemorrhage, infection and death. In many countries, the most common procedure is a sharp curettage, more commonly known as dilatation and curettage (D&C), which requires a physician, operating theater, and general anesthesia. **Manual Vacuum Aspiration (MVA) is the preferred procedure because it is lower risk, less painful, and less costly.** It can be done with local anesthesia and a few countries have successfully trained midwives to conduct the procedure[19, 78].

MIDWIVES PROVIDE PAC SERVICES

In Ghana, *midwives have been trained on MVA with very positive results. This has made a huge difference in the quality of care that is provided. In the past, since abortion complications are usually emergencies, the midwives would try to do something to help the woman but did not have the skills or equipment to provide services. After the training, the midwives felt confident providing the services due to their new skills. There was enhanced access to these services since there are more midwives than doctors, and the procedure could be peformed at a lower level of the health system, thus enhancing access. Lastly, support from a good referral system ensured that any complications that arose could be properly treated in a timely manner*[58].

Comprehensive Services**: Many women treated for (induced) abortion complications want to avoid pregnancy, but fewer than one-third of the women receiving care for abortion have ever used contraception**[17]**.** Although an (induced) abortion and its complications are stressful for a woman, it is important to provide her with information about her return to fertility, different FP options available, and services, if she chooses to use a contraceptive method. In many settings emergency care for women with abortion complications are provided by the maternity ward and FP services are provided in the outpatient department. These services are usually handled by different staff and are geographically separated. In many settings FP services are not provided on a daily basis. Studies have found that the most effective way to provide comprehensive services is if the maternity ward staff is trained to provide FP information and services on the ward itself. An alternative approach is to provide a mechanism for the FP staff to make regular visits to the maternity wards to provide these services.[19, 78].

Complicated Post-Partum

As stated previously, if complications are identified during the post-partum period, the delays previously discussed during childbirth similarly influence access to and receipt of quality services (see Table 5.16). Ideally, programs should be developed to monitor women and newborns in the first 24 hours after delivery. If a complication arises, they need to be promptly referred for appropriate services. Women who deliver in an institution and experience complications should stay at least 24 hours after delivery with close monitoring and planned follow-up. A feedback system needs to be in place to inform the health center and health post staff that a woman or newborn has had a problem and should be monitored more closely.

Table 5.17 tries to illustrate who may be responsible for monitoring the danger signs. This will vary by context depending on the various roles of the woman, the household members involved in decision-making and her care, the community resource persons available, and the health system. Countries, districts, and/or communities should adapt this table to reflect their local situation. Table 5.18 presents the essential post-partum services required by women.

TABLE 5.17

Current Best Practices
POST-PARTUM MATERNAL CARE

DANGER SIGNS: 24 HOURS POST-PARTUM

Danger Sign	Home Delivery Individual	Home Delivery Household	Home Delivery Community Resource Person	Delivery at Institution
Heavy bleeding	♦	*	*	♦
Atonic uterus	*	*	♦	♦
Placenta (retained)		*	♦	♦
Placenta (partial delivery)			♦	♦
Shock (fainting, cool, clammy)		*	♦	♦
Convulsions		*	♦	♦
Headache/visual disturbances	♦	*		*
Tears/lacerations		*	♦	♦
Urine output decreased	♦	*		♦
Blood pressure decreased		*		♦

DANGER SIGNS: FIRST WEEK POST-PARTUM

Danger Signs	Home Delivery Individual	Home Delivery Household	Home Delivery Community Resource	Delivery at Institution
Fever/chills	♦	♦	*	♦
Foul smell	♦	*		♦
Change in D/C	♦	*	*	♦
Abdominal Tenderness	♦	*		♦

♦ Primary responsibility. * Supportive role.

Household includes members of the household that may assist or be present at delivery (e.g., mothers, sister, in-laws)

Community includes TBAs, village health workers

TABLE 5.18

Current Best Practices
POST-PARTUM MATERNAL CARE

SERVICES: 24 HOURS POST-PARTUM

Services	Home Delivery Individual	Home Delivery Household	Home Delivery Community Resource Person	Delivery at Institution
Identify caregiver	♦	*	*	♦
Monitor danger signs	♦	*	♦	♦
Initiate BF	♦	*	*	♦
Teach BF practices		*	♦	♦
Provide FP			*	♦
Teach about hygiene/ cleaning	*	♦	*	♦

SERVICES: FIRST WEEK POST-PARTUM

Services	Home Delivery Individual	Home Delivery Household	Home Delivery Community Resource	Delivery at Institution
Health visit	*	*	♦	♦
Promote nutrition		*	♦	♦
Vitamin A provision	*	*	♦	♦
FP counseling		*	♦	♦

SERVICES: SIX WEEKS POST-PARTUM

Services	Home Delivery Individual	Home Delivery Household	Home Delivery Community Resource	Delivery at Institution
TT (if necessary)		*		♦
FP (POP IUD, Depo/VSC)		*	♦ *	♦
Health visit	*	*	♦	♦

♦ Primary responsibility. * Supportive role.

Household includes member of the household that may assist or be present at delivery (e.g., mothers, sister, in-laws)

Community includes TBAs, village health workers

VII. NEWBORN

Unfortunately newborn care has been a neglected area, thus there is little information, particularly at the operational level, on how to provide good newborn care at the community level or in peripheral health facilities to address perinatal and neonatal mortality and morbidity.

As stated in Chapter 1, every year almost 8 million fetuses/newborns die late in pregnancy, at birth, or soon after as the result of poor maternal care and/or inadequate management of pregnancy related complications. WHO estimates that 85 percent of newborn deaths are due to infections, birth asphyxia, and birth injuries (See Table 1.13).

Most neonatal deaths and at least half of stillbirths result from problems that arise during pregnancy, delivery, and/or the post-partum period. More than two-thirds of newborn deaths are among fully developed babies born at term and apparently well equipped for life. These children would have been healthy if appropriate care had been taken. Helping these children grow up healthy does not require expensive technology; rather, it calls for a set of simple preventive measures and prompt newborn care[12].

BEST REFERENCES

World Health Organization. (June 1995). **Essential Newborn CARE: A Report of a Technical Working Group**. Geneva: WHO.

Stolls. B. (March 1997). **"The Global Impact of Neonatal Infection."** Clinics in Perinatology, Vol. 24: No 1.

World Health Organization. (June 1995). **Management of the Sick Newborn: A Report of a Technical Working Group**. Ankara: WHO.

Newborn

The pregnant woman and fetus are symbiotic, and interventions to improve outcomes for one are intimately linked to the outcomes of the other (as presented in Figure 5.1).

Strategies to enhance newborn outcomes include improvement of normal delivery practices to avoid birth asphyxia and trauma, essential newborn care, identification of LBW babies with close supervision of progress, and close monitoring for danger signs in the first seven days. Place of delivery and the type of provider who attends the delivery will effect these strategies.

Table 5.19 describes essential newborn care and the danger signs to be monitored and referred in order to have a favorable newborn outcome.

TABLE 5.19

Current Best Practices

NEWBORN CARE

Preventive Newborn Care (Good Maternal Health)

- ✔ Provision of TT and IFA
- ✔ Adequate nutrition
- ✔ Treatment of infections (STIs, malaria, hookworm)
- ✔ Clean delivery
- ✔ Appropriate management of complications

Essential Newborn Care (First 24 hours)

- ✔ Attention to breathing
- ✔ Warming
- ✔ Cord care
- ✔ Prophylactic eye care
- ✔ Immediate breastfeeding

Normal Newborn (Beneficial)

- ✔ Weighing and registration

Newborn Care (First 7 days)

- ✔ Warming
- ✔ Exclusive breastfeeding
- ✔ BCG, OPV, Hepatitis B
- ✔ Monitor danger signs listed below

DANGER SIGNS FOR NEWBORNS
SEEK IMMEDIATE ATTENTION

AT BIRTH

Not breathing
Skin color is yellow (jaundice)
Labored breathing (greater than 60 respirations)
Convulsions

FIRST 7 DAYS

Hypothermia/Fever/Chills
Pale blue skin color including palms and soles of feet
Unable to suck twice
Unable to or poor sucking
Not active
Rigidity
Diarrhea/constipation
Red swollen eyes with discharge
Redness around the cord

INTERVENTIONS Normal Newborn

There are several times when interventions can be effective in improving neonatal outcomes, including:

- ➔ improving women's health **before she becomes pregnant** starting with good nutrition, adequate iron stores, sufficient prepregnancy weight, and good general health without infections (e.g., malaria);
- ➔ improving women's health **during pregnancy** with good nutrition, adequate iron, TT vaccinations, and treatment of endemic infections;
- ➔ improving women's health **during childbirth,** by ensuring clean and safe (minimize asphyxia) births;
- ➔ essential newborn care; and
- ➔ prompt and appropriate management of sick newborns.

Studies have found that community workers have been successful in monitoring hypothermia, identifying low birth weight and managing pneumonia if they are properly trained and supervised.

NEWBORN CARE

All newborns need basic care. Cleanliness at birth, warmth, early and exclusive breastfeeding, eye care, immunizations and resuscitation when necessary.

Some newborns need more care. Sick newborns need early recognition of danger signs and prompt treatment.

Pre-term and low birth weight newborns need more basic care. These newborns need more: 1) cleanliness and warmth to ensure they do not acquire any infections; 2) more attention to breastfeeding because they may have difficulty sucking; and 3) more effective recognition and treatment of infections.

UNICEF, 1998

Clean Delivery: (See Table 5.14.) Hand washing and wrapping the baby in a clean cloth can go a long way in reducing general infections, which can lead to sepsis if untreated. Cutting the cord with a clean blade reduces neonatal tetanus (about 500,000 cases annually). The umbilical cord does not need to have anything applied to it; it will mummify if exposed to air without dressings, binding or bandages. No antiseptics are needed, but the mother should keep it clean and dry[9]. Practices such as putting cow dung, mud, oil, or other materials on the cord should be avoided. The cord is one of the main sources of neonatal infection.

Thermal Protection: The normal infant is most sensitive to hypothermia the first 6-12 hours after delivery. Hypothermia can easily occur in a newborn that is left exposed and wet, for example, if they wait to tend to the baby until the placenta is delivered and the cord is cut. Families need to know the signs indicating hypothermia and how to re-warm the baby. The best way to warm the newborn is through skin-to-skin contact, sometimes called the kangaroo method. Other methods include wrapping the baby in layers of warm clothes and usually warm water bottles. Some cultures require bathing shortly after birth but that is not necessary and it may be more important to make sure the baby is warm[9].

LESSONS LEARNED

In Nepal, *TBAs were trained to take rectal temperatures. They found that 58 percent of newborns born between January and March had temperatures less than 35°C within 12 hours of birth. TBAs were trained to: 1) wrap/warm the baby immediately instead of letting them rest on the floor until the cord was cut; 2) postpone bathing; and 3) keep the baby's head covered*[11].

Early and exclusive breastfeeding: Breastfeeding provides optimal nutrition as well as a protective value for the first 6 months. Breastmilk protects the infant against a variety of viral and bacterial pathogens.

There is no evidence that supports providing supplemental feeding, water, glucose or formula before the fourth month and preferably before the sixth month. In the case of institutional deliveries, rooming-in should be encouraged because it facilitates breastfeeding, promotes maternal child bonding, and assists in preventing nosocomial infections.

As stated previously, HIV can be transmitted through breastfeeding (about 14% through breastfeeding). Countries need to develop policies and programs that consider the HIV prevalence, breastfeeding practices, alternatives for breast milk, and potential increases in other causes of infant mortality. The UNAIDS/UNICEF/WHO policy states that "women who are known to be HIV positive should not breastfeed", but the majority of woman in the developing world do not know their status, and many do not have access to counseling and testing services[68].

Eye infection prevention and management: Opthalmia neonatorum (conjunctivitis with discharge) usually appears two to five days after birth. The main causes of this infection are gonorrhea and chlamydia. The transmission rate from the mother to the fetus for gonorrhea is 30 – 50 percent; complications occur quickly and are more severe than for chlamydia. One percent silver nitrate solution, one percent tetracycline, or 0.5 percent erythromycin ointment should be used within one hour of delivery to prevent opthalmia neonatrum. (Note: silver nitrate is not effective against chlamydia.)

If the newborn develops opthalmia neonatorum, the decision of the treatment regime should be based on prevalence and types of STI in the local setting, resistance level, and drug availability (See Table 5.11 for treatment protocols)[67].

Immunizations: WHO recommends that BCG be given as soon as possible after birth, a single dose of oral polio vaccine (OPV) at birth or in the first two weeks, and the Hepatitis B vaccine as soon as possible after birth. In many countries children receive BCG and OPV, but usually not until six to eight weeks after birth[9].

Newborns have a very narrow window of opportunity to be properly treated to avert death.

INTERVENTIONS Complicated Newborn

Newborns have a very narrow window of opportunity to be properly treated to avert death. Delays in receiving quality services are due to lack of caretaker knowledge about the danger signs, long distances from facilities, cultural taboos and practices that inhibit newborns from acquiring care, inadequately trained health workers, and poorly equipped health institutions.

Delay #1: Interventions to reduce the delays in problem recognition. Several demographic and health surveys have shown that many women/caretakers do not know the signs and symptoms of pneumonia, dehydration, or other infections for their older children, therefore it is unlikely that they would know what to do for their newborns.

➔ Improve recognition by caretakers of danger signs in the newborn through education.

Delay #2: Interventions to reduce the delays in deciding to seek care.
Studies have found that children are not taken for health care services in a timely manner. In some settings, even when the health workers have identified the newborn as being sick (e.g., pneumonia), the families refuses to take the baby to the health facility[9, 10].

- ➔ Educate family members on the importance of seeking timely and appropriate care for newborns if a danger sign is identified.
- ➔ Train a community resource person to foster referrals if needed.

Delay #3: Interventions to reduce the delays in reaching the health facility.
As described earlier, communication, transportation and resources may all be major barriers to reaching the health facility in a timely manner.

- ➔ Train community workers on newborn resuscitation, treatment of ALRI and diarrhea in the community, and referral to an appropriate facility.
- ➔ Improve knowledge through communication efforts of where the nearest appropriate health facilities are and how to get there.
- ➔ As stated previously, transportation is a major problem in many areas. This is a barrier to accessing health services whether it is for the woman or the newborn.

Delay #4: Interventions to reduce delays in receiving quality treatment at the health facility.
Many health staff are not adequately trained or equipped to appropriately manage sick newborns which often results in neonatal deaths. In India, Pakistan, Malaysia, and Thailand the CFR for children brought to the hospital with neonatal sepsis ranged from 27 percent to 69 percent, which is very high. These rates indicate that training on identification and prompt, appropriate management of newborn illnesses could make significant progress towards better care and more favorable outcomes [12].

- ➔ Train health workers how to properly diagnose and manage newborn illnesses.
- ➔ Work to ensure that equipment is functional and an inventory control system is in place to maintain an adequate and regular supply of drugs.

Initiation of breathing and resuscitation: If a newborn does not cry after initial stimulation by drying the baby, aspiration of the upper airway should be done. However, this may not be sufficient to initiate breathing, and active resuscitation must be started if the infant has not started breathing.

Newborns often have difficulty breathing after obstructed or prolonged labor, premature deliveries, by having with low birth weights. These conditions could be anticipated by a provider so that provisions could be made in advance to prepare for resuscitation. In Northern India, birth asphyxia was such a problem that TBAs were trained to resuscitate newborns with positive outcomes[11]. In health institutions the staff should be competent in life-saving skills and equipped to properly resuscitate the newborn. WHO provides a practical guide titled "Newborn Resuscitation at the Health Center Level."

Management of newborn illnesses: Since a large proportion of births occur at home, families and communities need to understand that a positive outcome depends on rapid recognition and management.

LESSONS LEARNED

An NGO in India experimented with case management of pneumonia by village health workers (VHWs) and TBAs. They trained VHWs and TBAs to diagnose pneumonia based on rapid respiratory rate, nasal flaring, and chest in-drawing. The project developed a breath counter (hour glass) which measured one minute to aid with counting respirations. The majority of pneumonia cases occurred during the first month of life. The TBAs had the largest caseload with 50 while the VHWs had 33, but they had similar CFRs. Neonatal mortality due to pneumonia dropped by 44 percent (See Chapter 6)[79].

Case fatality rates for severe bacterial infections (e.g., pneumonia) are high and it is important to quickly refer the infant. Some TBAs have been trained to treat with Co-trimoxazole and refer with some success[29]. Family members and community workers need to be trained to recognize the danger signs and know where to go to obtain services. They should also know that if the newborn has trouble breastfeeding or is less active this may be a sign of infection and they should seek assistance.

Case fatality rates are high in referral facilities (e.g., district hospitals) resulting from: 1) late arrival of the infant; 2) lack of sufficient medicines and supplies; and 3) unskilled providers. The health staff needs to be skilled in diagnosis and appropriate case management of the major diseases in that setting to ensure a favorable outcome. Neonatal case reviews can be very useful in identifying areas of improvement.

The underreporting of perinatal/neonatal deaths is a serious problem throughout the developing world. Vital registration systems are often inadequate and need to be strengthened. In the institution, case reviews can consist of interviews with the providers and/or a study of the medical records and other data to ascertain the clinical and social causes of the death. In the home, a verbal autopsy can be done by interviewing the family members to determine the medical and non-medical causes of death.

All sick newborns should receive Vitamin K intramuscularly to help reduce the likelihood of hemorrhagic disease. These newborns should also be considered hypoglycemic and need to have continued breastmilk and intravenous fluids if they are dehydrated[10]. Treatment protocols may vary in each setting, but some suggested treatments are presented in Table 5.20.

TABLE 5.20
PREFERRED TREATMENT FOR NEWBORN INFECTIONS

1.	**Sepsis**	(IV until improves, then IM 10 days)
	Preferred Treatment:	Ampicillan
	Alternative Treatment:	Gentamycin
2.	**Meningitis**	(IV until improves, then IM 14 days)
	Preferred Treatment:	Ampicillan
	Alternative Treatment:	Gentamycin
3.	**Convulsions**	
	Preferred Treatment:	Phenobarbital (IV)
	Alternative Treatment:	Phenytoin (IV) or Paraldhyde (suppository)
4.	**Tetanus**	
	Preferred Treatments:	Antitoxin, Penicillin, Anticonvulsant

Source: Stolls, B. 1995.
IM: intramuscular, IV: intravenous

Care of Low Birth Weight Babies: In the developing world, most LBW babies are born at or near term. They have reached maturity and have the full potential to survive. However, because of their reduced weight and lack of fat stores as a source of energy and insulation, they are at risk for hypothermia and poor growth. Good thermal protection and breastfeeding are the two most important elements in their care. Adequate warmth can substantially reduce mortality.

As stated in the anthropometric section of this report, some nutrition indicators may be useful to identify women who are at risk nutritionally, and those that have a higher risk of delivering a LBW baby. These women could be counseled to deliver in a facility or provisions could be made to ensure closer monitoring of the newborn in the home.

LESSONS LEARNED

The Indian Government trained TBAs and Aganwandi Workers (AWW) to assess low birth weight by measuring foot length. The TBAs were trained on essential newborn care (warming, and resuscitation) and to take a foot imprint of the newborn. The TBA monitored feeding, color of the soles of the feet, and activity level. The AWW came within 24 hours after the birth. If the foot size was less than 6.5 cm the baby was considered to be LBW and was referred to the sub-center for closer monitoring. As a result, attending birth registration increased and infant mortality dropped from 58.1 in 1989-90 to 45.1 in 1990-91[74].

TABLE 5.21

ESSENTIAL NEWBORN CARE AND DANGER SIGNS

Essential Care	Practices At Birth	Practices First 7 Days	Danger Signs	Treatment At Health Center
Clean Delivery	6 Cleans* before, during, and after birth Warm place of birth.	N/A	N/A	N/A
Clean Cord Care	Cut cord with clean blade, tie tight and leave open to air.	Keep clean, leave open to air. May clean with water but not necessary.	Yellow, foul smelling drainage. Redness extending to abdomen.	Give first dose antibiotic and refer.
Breathing	No crying, check breathing. Start resuscitation.	If no breathing, start resuscitation. Monitor LBW.	Difficulty breathing.	Resuscitation. Assess for respiratory infection.
Thermal Protection	Warm place of birth. Dry baby with warm clean cloth immediately. Give to mother for skin-to-skin warming.	Keep baby warm and dry. Wrap according to climate.	Cold to touch. Hot to touch. Poor sucking.	Determine cause (e.g., infection). Treat appropriately (e.g., re-warm, bathe, give antibiotic, and refer).
Immunizations	N/A	BCG, OPV, Hep B	N/A	N/A
Birth Asphyxia	Management of complications. Resuscitation if needed.	Keep warm, breastfed. Monitor sucking/feeding.	Convulsions. Weak/ lethargic.	Give first dose of antibiotic and refer. Resuscitation if needed.
Infection	6 Cleans*	Keep warm, clean, breastfeed. Cord stump and eye care.	Hypo/hyperthermia, lethargy, poor feeding, convulsions.	Identify source of infection, give first dose of antibiotics and/or refer.
Pneumonia	Warm place of birth. Dry baby with warm clean cloth immediately.	Keep baby warm, dry, breastfed. Monitor respiration.	Response Rate >60. Nasal flaring, chest in-drawing.	Treat according to protocol symptoms. Give first dose of antibiotics, and refer.
Neonatal Tetanus	6 Cleans*	Keep warm. Clean cord and eyes.	Convulsions. Rigidity.	
Eye Care	Clean eyes right after birth with clean cloth. Apply drops/ointment per protocol.	Keep eyes clean. Do not apply herbs or other medicines.	Swollen, sticky with discharge.	Clean eyes, give parental antibiotic and refer.

*"Six cleans" Clean surface, Clean string to tie the cord, Attendant with clean hands; Clean blade to cut the cord; Clean cloth to wrap the baby in, Clean cloth for the mother.

VIII. CONCLUSION

This Chapter has tried to provide a synthesis of the recommended interventions and Current Best Practices based on the literature and lessons learned from country programs to significantly influence maternal and neonatal morbidity and mortality. Presented below is a summary of maternal and neonatal interventions to address the various delays that impede access to quality maternal and newborn health services.

TABLE 5.22
EXAMPLES OF MATERNAL HEALTH INTERVENTIONS

MATERNAL HEALTH INTERVENTIONS

Possible interventions to reduce delays in problem recognition.

- ➔ Improve antenatal services through education of women to address harmful practices, recognize danger signs, plan for complications, and understand the importance of prescribed regimens.
- ➔ Improve antenatal services through training health workers to take better pregnancy histories, encourage birth planning, treat common illnesses (anemia, malaria), and identify and promptly refer complications.
- ➔ Encourage women to use skilled providers (e.g., midwives) to assist with home and/or institutional deliveries.
- ➔ Improve training of TBAs and midwives about use of the "six cleans."
- ➔ Encourage prompt referrals by training TBAs, community members and women about where to go for emergency services.

Possible interventions to reduce delays in deciding to seek care.

- ➔ Increase women's status/participation in decision-making, including control over resources through couple communication and education of key decision-makers.
- ➔ Endorse the concept of birth planning in antenatal visits and through community mobilization.
- ➔ Encourage use of skilled providers to assist with deliveries, either at home or in the health institutions.
- ➔ Work with the community to foster a supportive environment for women to access care.
- ➔ Work with the community to facilitate better relationships between the community and the health staff.
- ➔ Work with the community to identify ways to streamline decision-making processes (e.g, proxy decision-makers).

Possible interventions to reduce delays in reaching the health facility.

- ➔ Improve communications and relationships among families, the community, and health workers.
- ➔ Improve the ability of families to pay for services through individual savings and low cost community loans.
- ➔ Improve the transportation systems by working with the local communities.
- ➔ Train TBAs and community members in obstetric first aid in order to stabilize the woman until she can get medical care.
- ➔ Reduce the need for emergency transportation systems by developing maternity waiting homes.
- ➔ Improve community's knowledge regarding the nearest appropriate health facilities and how to access their services.

Possible interventions to reduce delays in receiving quality treatment at the health facility.

- ➔ Train midwives and doctors, especially female doctors where available, in life-saving skills.
- ➔ Enhance support systems to monitor quality and reduce cumbersome administrative processes that prolong waiting time, especially for blood replacement.
- ➔ Establish/strengthen a continuous monitoring system that can review cases in terms of appropriate medical management.
- ➔ Establish a well-stocked kiosk on the hospital grounds where families can buy needed materials (all in one package) at an affordable price.
- ➔ Work to ensure that equipment is functional, proper infection control practices are utilized and an inventory control system is in place to maintain a sufficient stock of drugs and medical supplies on a regular basis.
- ➔ Work to ensure that services are provided on a 24-hour-a-day basis.
- ➔ Promote "Mother Friendly" environments in health institutions.
- ➔ Work to ensure that key support systems are useful and operational, such as management information systems for referrals and follow-up.
- ➔ Monitor key factors such as waiting time, CFR, and perceptions of women admitted to the facilities, as indicators of quality.
- ➔ Involve the guards and receptionists so that people are not locked out of the hospital grounds, particularly at night.

TABLE 5.23
EXAMPLES OF NEONATAL INTERVENTIONS

NEONATAL INTERVENTIONS
Possible interventions for improving neonatal outcomes. ➔ Improve women's health before she becomes pregnant starting with good nutrition, adequate iron stores, sufficient prepregnancy weight, and good general health without infections). ➔ Improve women's health during pregnancy with good nutrition, adequate iron, TT vaccination, and treatment of endemic infections. ➔ Improving women's health during childbirth, by ensuring clean and safe births. ➔ Ensure essential newborn care. ➔ Promote and appropriate management of sick newborns.
Possible interventions to reduce the delay in problem recognition for a complicated newborn. ➔ Improve recognition by caretakers of danger signs in the newborn through education.
Possible interventions to reduce the delay in deciding to seek care for a complicated newborn. ➔ Educate family members on the importance of seeking timely and appropriate care for newborns if a danger sign is identified. ➔ Train a community resource person to foster referrals if needed.
Possible interventions to reduce the delay in deciding to seek care for a complicated newborn. ➔ Train community workers on newborn resuscitation, treatment of ALRI and diarrhea in the community, and referral to an appropriate facility. ➔ Improve knowledge through communication efforts of where the nearest appropriate health facilities are and how to get there.
Possible interventions to reduce the delay in receiving quality treatment at the health facilty for a complicated newborn. ➔ Train health workers how to properly diagnose and manage newborn illnesses. ➔ Work to ensure that equipment is functional and an inventory control system is in place to maintain an adequate and regular supply of drugs.

6

LESSONS LEARNED THROUGH COUNTRY PROGRAMS

I. OVERALL PROGRAMS

This section presents several country programs that have been successful in addressing maternal mortality and morbidity through a combination of interrelated interventions.

A. BANGLADESH (ICDDR,B)

The MCH-FP Extension Project is a collaborative effort between the Ministry of Health and Family Welfare (MOHFW) and the International Centre for Diarrhoeal Research in Bangladesh (ICDDR,B). The project has been involved in the initiation of basic emergency obstetric care services (EmOC) in Abhoynagar, which is about three hours outside of the capital. The main causes of maternal death were unsafe abortion, post-partum hemorrhage, pregnancy-induced hypertensive disorders, obstructed labor, and sepsis. Ninety-five percent of all deliveries and 80 percent of all the maternal deaths occurred at home, most within the first 48 hours of delivery.

ACTIVITIES

- ✔ Skilled community midwives were assigned to the health posts covering a population of 20,000 each. They made antenatal visits in the community, provided health education, detected and managed antenatal problems, encouraged presence of community midwives at deliveries, provided immediate treatment of complications if possible, organized and accompanied the women during referrals to the maternity clinic, and visited new mothers as soon as possible after delivery.
- ✔ Established a maternity clinic that could provide basic EmOC services with a female physician on call 24 hours a day.
- ✔ Equipped the government hospital with skilled staff, the ability to provide blood replacement, and surgical capabilities to provide comprehensive EmOC services (one hour away).
- ✔ Communications strategy to educate TBAs and women to recognize complications and know where to obtain services.

RESULTS

There was a significant drop (68 percent) in the number of maternal deaths (from 440 to 140/100,000 live births) in the intervention area in a three-year period. The majority, 80 percent of the complicated cases, were managed by the community midwives[80].

B. BOLIVIA: Warmi (MotherCare and Save the Children)

Aymara, with a population of 15,000, is a remote and difficult to reach area. It is served by three health posts that lacked equipment, supplies and skilled personnel to manage obstetric complications. The MMR was over 1,000/100,000 live births and the perinatal death rate was 103/1,000 births. Traditional birth attendants do not exist. Husbands are the main providers of assistance during labor.

A simple model for community level problem-solving (called Warmi) consisted of: 1) identification and prioritization of problems; 2) development of strategies and action plans by the community and women's groups to solve their own problems; and 3) implementation of group plans. Activities included educating both women and men in management of hemorrhage, provision of FP in collaboration with a local NGO, development of a home-based women's health card, a radio program, a flip chart, and four IE&C booklets, as well as training 45 husbands on basic delivery practices. The community identified a person to be responsible for drying the baby, cutting the cord before the placenta was delivered, and promoting immediate breastfeeding.

ACTIVITIES

- ✔ Formed women's groups to increase knowledge about specific maternal health problems and increase resources among women.
- ✔ Educated men and influential family members regarding pregnancy-related complications and the need for referral. The communities identified and prioritized problems, then they developed their own action plans, using local resources, to address their needs.
- ✔ Trained community members to attend births and know the danger signs of complicated deliveries.
- ✔ Improved access to family planning, antenatal and emergency obstetric services, based on the community level action plan.

RESULTS

Over half of the women in the 52 communities participated in this process between 1991-93. Results showed a reduction of perinatal deaths from 75 to 31 over a two-year period. This decrease was mostly due to a reduction of deaths in the immediate newborn period. There was an increase in coverage of TT, IFA consumption, breastfeeding, use of iodized salt, attendance at antenatal and post-natal care services, and use of trained attendants. Use of FP went from 0 to 27 percent, but there was no reducion in MMR[76].

C. *BOLIVIA: Cochabamba Reproductive Health Project, 1990-1993*

In Cochabamba, half of the population is urban. The MMR was 480/100,000 live births, IMR was 126/1,000 live births and PNMR was 110/1,000 births. Major causes of maternal death were induced abortion and poor condition of delivery, both during home and institutional deliveries. Traditional beliefs are dominant and only 13 percent of the urban population used the western medicine system. In 1991, 34 percent of women went for antenatal care, but only 13 percent had attended four sessions.

ACTIVITIES

A survey was conducted to identify beliefs and practices during pregnancy and childbirth. Then a health communication plan was initiated in three phases: 1) sensitization of policy makers and health providers; 2) antenatal care promoting the importance of clean home deliveries using clean materials; and 3) recognition of complications. Each phase lasted three months. The project developed a video and radio program as well as a flipchart for each major sub-theme. The providers received training on how to use the materials and strengthen their interpersonal skills.

RESULTS

Women who could identify one danger sign rose from 26 percent to 43 percent. The number of women who could identify edema as a danger sign rose from two percent to 64 percent. This was particularly significant because these women had previously believed that edema was a sign that they would have an easy birth. Perhaps the most important accomplishment of the campaign was that it transformed women from passive patients to proactive agents, who were better able to obtain antenatal care. There was no change in the PNMR or MMR figures[77].

D. GUATEMALA: Quetzatenago Project (MotherCare), 1989-1993

In rural Guatemala TBAs deliver between 70 and 90 percent of all births. Obstetric skills are only available in hospitals, while antenatal and child health services are available at the health posts. Midwifery training in Guatemala was abolished 20 years ago.

To address this void, the Institute of Nutrition of Central America and Panama (INCAP) trained the nursing staff to train over 400 TBAs in 1990. The training consisted of aspectic techniques, identification of danger signs, and referral to the nearest appropriate health facility.

ACTIVITIES

- ✔ Trained TBAs to recognize danger signs for both mothers and newborns through a more participatory approach, building on their own cultural beliefs and experiences.
- ✔ Improved relations between the TBAs, the community, and the medical providers, by educating the communities and the health providers about each other's role.
- ✔ Fostered community support for the program to ensure that transportation (a boat in many cases) was available.
- ✔ Enhanced the ability of the health providers to identify danger signs instead of depending on the "at risk screening approach" and to be able to manage obstetrical complications, including strengthening support systems.
- ✔ Developed protocols for recognition and appropriate management of maternal and neonatal complications.
- ✔ Introduced a case review system where each maternal death is reviewed and discussed by the team to identify how the situation could be handled in the future.
- ✔ Improved the referral system through better record keeping, better treatment of TBAs when they referred a woman to the hospital, and registering of pregnant women and home births.

RESULTS

One year after the TBA training there had not been significant changes in community level behaviors. Nearly half of the women with complications used health facilities before the intervention, and this did not change significantly after the intervention. Referrals from TBAs actually decreased, but more women were going directly to the facility after the intervention. (Note: Women in this study area lived close to

the hospital and the infrastructure was relatively good.)

The intervention had more impact at the hospital level. Patient satisfaction increased and delays between admission and treatment decreased. Prior to the intervention, 74 percent of the women said they would return, while after the intervention, 94 percent of the women indicated they would return to the health facility[82].

E. MALAYSIA

Malaysia has had a steady decline in maternal mortality through a comprehensive program that promotes well-defined screening programs, skilled providers attending births, increase in institutional deliveries, and appropriate management of complications and follow-up.

ACTIVITIES

- ✔ Upgraded district hospitals for diagnostic and management support.
- ✔ Refined antenatal screening program (color coding).
- ✔ Decentralized services to the district level.
- ✔ Trained a district team on problem solving and management.
- ✔ Introduced a national confidential inquiry of maternal deaths.
- ✔ Improved skills of professional health workers, particularly family care physicians, in life-saving skills.
- ✔ Re-trained TBAs as partners–refering pregnant women but also providing emotional support to the woman and family.
- ✔ Increased deliveries attended by skilled providers.
- ✔ Established alternative birth centers in rural and urban areas.
- ✔ Ensured functional referral and emergency transport systems.
- ✔ Promoted client-centered health education for women, men, families, and communities.
- ✔ Promoted maternal and child nutrition, breastfeeding, and newborn care.

RESULTS

Maternal mortality has dropped from 300/100,000 live births in the 1960s to 40/100,000 live births in 1997. Attendance of a skilled provider at birth rose from 57 percent in 1980 to 95 percent in 1996.

II. TRADITIONAL BIRTH ATTENDANTS

A. BRAZIL: Forteleza Program, 1975-1984

ACTIVITIES

Mini-maternity units were set up throughout the region and TBAs were trained. The 40 units varied in size, resources, and services. The largest unit had 8 to 10 beds and could provide antenatal, delivery, and post-partum services. The smallest units consisted of a single room adjoined to the TBAs' home and were limited to normal delivery and post-partum care.

In one of the program counties, far from the district hospital with difficult transportation, four mini-maternities were established and 78 TBAs were trained. Training of TBAs included practical supervised experiences in the mini-maternities to ensure they could provide antenatal care, identify problems, assist in normal deliveries, and provide post-partum care for the mother and newborn.

RESULTS

At the end of the program, 64 percent of deliveries took place at home and 36 percent in hospitals. Of the ten percent of women who developed a complication, 93 percent delivered in a hospital. Almost half (49%) of these women were referred by a TBA while the remaining women (51%) were self-referred.

The TBAs were more skilled at identifying complications. Fifty-two percent of the TBA referrals were confirmed as complications while only 18 percent of the walk-ins (self-referred) complications were verified. TBAs did not have a significant impact on infant survival, however, the risk of an infant dying was much lower with a TBA that had higher caseloads of deliveries. Perinatal mortality appeared to be lowest for deliveries at the mini-maternities[83].

B. THE GAMBIA

In 1983 a primary health care program was introduced into the rural Farafenni area of the Gambia. The MMR was 673/100,000 live births and antenatal attendance was very low.

ACTIVITIES

- ✔ Untrained TBAs were identified and received a 10-week training course to enable them to offer antenatal and post-partum services, attend normal deliveries, identify danger signs, and refer women to the health center where there was a trained nurse midwife.
- ✔ Supplied TBAs with birthing kits which included clean dressings, scissors, string, oral ergometrine and disinfectant.
- ✔ Trained nurse midwives, but had no emergency drugs or equipment at the health center.

RESULTS

This study showed that TBAs have an important role in encouraging antenatal care, identifying high-risk women and expediting referral. The MMR fell to about half of its pre-intervention level in the Primary Health Care (PHC) villages. TBAs may have played some role, but other factors such as improved transportation may have also contributed. Even though TBAs could identify high-risk women, adequate back-up services at the health center and particularly at the hospital level were not available. Interventions that solely target TBAs cannot be expected to reduce maternal or neo-natal mortality without adequate emergency obstetric services. The lack of backup services is the main reason why the MMR did not decline further[74].

III. MATERNITY WAITING HOMES

Maternity waiting homes are residential facilities, located near a qualified medical facility, where women usually defined as high-risk can wait for their labor to start, then they are transferred to the health facility. While anecdotal evidence indicates that maternity waiting homes are successful in reducing maternal mortality, little quantitative research has been done to assess their effectiveness.

For centuries in Europe, shelters have been provided for single mothers in an effort to reduce abortion and infanticide. In Africa, one of the early experiments with maternity waiting homes, known as Maternity Villages, was in Eastern Nigeria in the 1950s. Such homes helped reduce maternal mortality in hospitals from 10 to less than 1 death per 1,000 deliveries, and the rate of stillbirths was reduced from 116 to 20 per 1,000 deliveries. In Uganda, where similar homes were operational in the 1960s, recorded maternal deaths in one remote area fell by half. The following examples (Cuba, Ethiopia, Ghana, and Nicaragua) demonstrate the diversity of maternity waiting homes. These homes do not require costly or high technology, and they can be a practical way to meet women's needs. However, **maternity homes CANNOT function in isolation; they must have timely access to quality obstetric services[75].**

A. CUBA

Cuba's health system was established in 1961 and MCH was a priority from the outset. The reduction of maternal and infant mortality has been a stunning achievement of the Cuban health care system. To promote institutional deliveries, a network of hospitals for the entire population was established. Special attention was given to rural areas where access was difficult due to poor road conditions and lack of transportation.

Maternity waiting homes were established in the vicinity of hospitals, so those women from remote areas could be accommodated in the last few weeks of pregnancy. The intended function of these homes was to go beyond the solutions that could be provided by obstetric hospitals. The majority of women using the maternity homes were drawn from socio-economic classes where they were subject to an immense burden of work and responsibilities during their pregnancy. These homes, with their technically qualified staff, provided a sanatorium for women during their pregnancy. They placed the women in an environment with many positive factors that also helped reduce their workload.

The criteria for referral to these homes were flexible. In some rural areas, all women were referred in the 34th week of their pregnancy, while others referred women based on key risk factors such as primaparity, grand multiparity, poor obstetric history, age below 20 or over 35, and poor nutritional status. Social risk factors included unwed mothers, lack of social support, and inadequate living conditions.

In rural areas, a home has between 15 and 20 beds and is attached to a local hospital. Delivery does not occur in these homes; all women are transferred to the hospital. All basic amenities are provided by the hospital, such as laundry and food. There is also autonomy in the home concerning visiting hours, use of kitchens, and entertainment rooms. Each waiting home has four health personnel and nursing care is available 24 hours a day. During their stay women are offered educational activities, including birthing practices. By 1990 there were 150 maternity waiting homes throughout the country.

One of the important features of Cuban maternity waiting homes is their character as a community service. Several community groups such as the Women's Federation, local political organizations, and agricultural unions participate in the home's management and contribute to the construction and maintenance costs.

ACTIVITIES

- ✔ Trained TBAs to manage rural maternity units, provide antenatal care, screen women, and refer.
- ✔ Established a referral system, which has been the key to the program's success, to ensure those high-risk patients were quickly identified and referred to the maternity hospital.
- ✔ Scheduled regular visits by midwives to ensure that antenatal care was conducted and high-risk women were identified.
- ✔ Encouraged harmless or beneficial traditional practices in the health institutions, including vertical delivery position.

RESULTS

Improvements in the general level of health over the past quarter of a century has led to a decline in the MMR from 118 to 31/100,000 live births between 1962 and 1984.

B. ETHIOPIA

Attata Hospital, a 55-bed community-based hospital, is 17 kms from the nearest town and covers a population of 1.5 million, with 300,000 persons living one or two days walk away. The nearest referral hospitals are over 100 kms away. Because of the difficult journey for the population, a "tukul" or maternity waiting home was opened in 1976 for high-risk pregnant women. The tukul was built out of local materials and cost about $1000 to construct, with all the labor and most of the supplies being provided by the community. Overhead costs are about $500 a year for a watchman, maintenance, and laundry costs. The average length of stay for a woman is 15 days.

ACTIVITIES

- ✔ Designed and supported by a woman's group that was already active in the community surrounding the hospital. The community provided all the labor and materials.
- ✔ Trained 13 TBAs and village health workers to work in the health posts where antenatal care was provided by the TBAs and nurse midwives once a month.

- ✔ Conducted screening based on poor obstetric history including pre-term labor, C-section, fistula, referral for retained placenta, hemorrhage, and post-partum fever. In addition, screening was conducted based on factors during their current pregnancy included bleeding, high blood pressure, malpresentation, severe anemia, age (very young), height, and first pregnancy.
- ✔ Referred high-risk women to the maternity waiting home two weeks before their expected delivery.
- ✔ Accompanied by a family member, women brought their own food and firewood to the facility.
- ✔ Visited by a nurse from the hospital every day and the women attended antenatal care services.

RESULTS

Of the 72 women who entered the home, 34 had C-sections. Of the women who previously had stillbirths, all who entered the home had live births. The stillbirth rate was 10 times higher for those directly admitted to the hospital compared to those that went to the waiting home first. **The key to the successful utilization of this home appears to be the involvement of the community in designing, building and supporting the waiting homes[75].**

C. *GHANA*

Danfa is a busy urban area 30 km north of Accra with six hospitals and 68 maternity homes, yet 93 percent of the deliveries are attended by TBAs. Although the TBAs could identify complications, they often performed the delivery themselves rather than refer women to the hospital. Women's preference for TBAs included cost, distance, lack of supplies and equipment, and fear of anticipated treatment by medical providers (painful and disrespectful). Therefore, a wing of the hospital was renovated to be used as a maternity waiting home. Twenty-five women were referred to the waiting home within the hospital.

RESULTS

Over the two year project period, only one woman actually went to the waiting area and stayed over night. The cost and hardship of being separated from their families, lack of facilities (e.g., cooking and laundry), absence of community support, and desolate surroundings were reasons for poor utilization of the waiting home within the hospital[75].

D. NICARAGUA

The Casa Materna (maternity house) has 20 beds and was inaugurated in 1987 where a local women's activist from the Nicaraguan Women's Organization decided to address the incidence of maternal and infant mortality in rural areas. They discovered that women did not come to the hospital because they did not have anywhere to stay in the city. According to the director, the goal of Casa Materna is "to achieve women's full potential through a learning process focusing on reproduction and reproductive freedom". The Center for High Risk Pregnancies and the Continuing Education Center also supported the home. These organizations serve rural women who have been diagnosed as "high-risk" (i.e., very young, very old, high blood pressure, more than five children, multiple births, miscarriages, and post-partum sterilization). Most women are poor, rural peasants. The pregnant women that stay at the home help with cleaning, cooking, washing, and gardening as well as performing Income Generating Activities (IGAs), such as sewing. Women usually come one week before delivery. When they go into labor they are transferred to the hospital. After delivery, the woman and her baby usually return to the maternity house for four to six days to learn more about newborn care[75].

IV. COMMUNITY PROGRAMS

A. INDONESIA: World Bank Project

Through the World Bank Project, Delivering Safe Motherhood Services in Indonesia, its "village midwife" program was launched in 1988, with the ambitious target of placing a midwife in every village by the year 2000. The World Bank supported the training and deployment of these midwives, so that 54,000 are now in place. The project's objectives include: creating individual, family, and community level demand; linking the demand with improved quality of services at the community and referral levels; developing sustainable systems to maintain the community midwife program; improving the technical skills of hospital staff to manage obstetric emergencies; and investing in the future through an adolescent reproductive health education program.

ACTIVITIES

- ✔ Introduced the use of home-based maternity care records, filled in by TBAs but kept by mothers. Trained the TBAs how to use the cards, focusing on recognition of danger signs and appropriate referrals.
- ✔ Trained (competency-based) and deployed community nurse midwives posted in each village, developed a continuing education system and strengthened the midwifery association.

- ✔ Trained general practitioners to manage obstetric complications at the district hospitals.
- ✔ Improved coordination among the various health facility levels as well as between the facilities and communities.
- ✔ Improved record keeping with better registration and established a case review system (maternal/perinatal audit of each death).
- ✔ Educated the community on the need for referrals for complications and assisted them in enhancing the referral system by developing transportation systems.
- ✔ Established a social marketing program to increase access to safe birthing kits, and educated communities on the importance of clean home births.
- ✔ Introduced regular peer review. Individual village midwives received supervision and guidance from more senior midwives trained in the process of peer review.
- ✔ Developed continuing education materials from the information collected during individual peer review visits on knowledge and skills requiring further reinforcement.

RESULTS

There was an increase in antenatal care attendance from 75 percent to 95 percent in the intervention area. One third of the women who developed complications in the intervention area delivered in the hospital compared to only ten percent of women in the control area. Even though TBAs in the intervention area were trained to improve referral, the rate was low and only slightly higher than the control area. One reason may be that women in both areas could proceed to the hospital directly and often did so[84].

B. NEPAL: (CEDPA)

The Safe Motherhood Network began in 1995 building on the successful National Condom Day. The first network activity was March 8, 1996 where over 20 international and Nepalese organizations mobilized to disseminate the message of a National Clean Delivery Day in 41 of Nepal's 75 districts. The group was so pleased with its success that they developed a network and held a planning meeting to articulate/formulate an action plan to sustain the efforts, including to:

1. promote intersectoral collaboration;
2. develop an annual theme that will be reinforced by all organizations throughout the year; and
3. continue circulation of IE&C materials, based on the annual theme.

The second network event was held on March 8, 1997 and included 63 organizations in 70 districts, reaching about 8 to 9 million men and women with the message of "Family Responsibility"[85].

C. *NEPAL: PATH/Save The Children*

In Nepal, women typically give birth on unclean surfaces assisted by untrained individuals, usually a family member or by another woman from the village. For too many women and children, these practices lead to infections, including sepsis and tetanus. PATH and the Save the Children Alliance came up with a solution to this problem. They developed a prototype single-use, safer, disposable delivery kit and then they facilitated distribution to pregnant women. The Government of Nepal has endorsed the kit and a private women-owned Nepali company is manufacturing it. To date, more than 100,000 kits have been socially marketed throughout the country. The kit offers clean delivery supplies and instructions on their proper use. It is inexpensive and available in small shops, the local market, and through women's groups[86].

D. *CROSS RIVERS STATE, NIGERIA (PMM)*

ACTIVITIES

- ✔ Sensitized policy makers to the problem of maternal mortality.
- ✔ Trained the blood bank staff to improve their attitudes and enable them to more promptly respond to blood requests.
- ✔ Provided blood bank facilities at the district hospital and one polyclinic with a refrigerator, blood bags, and blood sets.
- ✔ Streamlined administrative procedures for blood donation and cross typing.
- ✔ Trained 20 community educators to address the community's fear and misperception regarding blood donation.

RESULTS

Blood donation increased from 40 pints per month in 1990 to 81 in 1995, however a national strike interrupted the services and the increase was not sustained. Previously most blood donors were paid, but after the intervention, volunteer donation increased from eight percent to 53 percent. Awareness of the communities regarding danger signs ranged from five percent for obstructed labor to 63 percent for post-partum hemorrhage. Fourteen of the 39 communities developed programs and loans were granted in nine of the 14 communities. Transportation systems were also developed in nine of the communities[87].

V. OBSTETRIC SERVICES

A. JUABEN, GHANA (PMM): Health Center

ACTIVITIES

- ✔ Provided equipment for the operating theater, labor suite, and lab.
- ✔ Improved water supply for facility.
- ✔ Posted a physician at the health center who could manage obstetric complications.
- ✔ Provided refresher training for midwives on life-saving and interpersonal skills.
- ✔ Purchased drug package and established a revolving fund.
- ✔ Advocacy to establish a blood bank that maintained a small stock of blood at the health center; a refrigerator and other supplies were provided.
- ✔ Instituted a blood donor association through the local Red Cross and established a stable blood supply.
- ✔ At a later phase, educatation of the community to recognize danger signs and stress the need for prompt treatment was added.

RESULTS

The number of women with complications seen at the hospital increased from 19 in 1992 to 37 in 1995. C-sections increased from 23 in 1993 to 90 in 1995. No deaths occurred among women treated. Referrals from the health center dropped from 42 percent to 14 percent because more cases could be treated at the health center. There was significant increase in manual removal of placenta, vacuum extraction and episiotomy repair procedures[88].

B. PAKRO, GHANA (PMM): Health Post

ACTIVITIES

- ✔ Upgraded the blood bank at the district hospital with a refrigerator and generator.
- ✔ Established a health center including beds, a refrigerator, safe water supply, drugs, and supplies.
- ✔ Trained midwife (on life-saving skills, PHC and interpersonal skills) was posted at health center.
- ✔ In 1994, community interventions focused on reducing delay in seeking care.
- ✔ Trained TBAs on recognition of danger signs.

RESULTS

The total number of deliveries increased from 16 in 1992 to 25 in 1995. Thirty-two women with complications came to the health center during that period; 12 were treated and 20 were referred[89].

C. EKPOMA, NIGERIA (PMM): Hospital

ACTIVITIES

- ✔ Provided equipment for the operating theater, labor suite, and lab.
- ✔ Provided refresher course for physicians on emergency complications for nurses on basic obstetric services, and for the lab staff on blood processing.
- ✔ Purchased drug package and established a revolving fund.
- ✔ Established a blood bank with a stand-by generator.
- ✔ At a later phase, mobilized communities to set up emergency transportation funds.

RESULTS

Of the 13 clans contacted, 12 launched loan funds. In the first year 456 families requested loans (ranging from $7 to $15); 380 were granted, with 354 being re-paid in full.

Although the number of women admitted to the hospital remained constant, C-sections increased from 0 in 1991 to 13 in 1995. The number of women with complications seen at the hospital increased from seven in 1990 to 29, with the percentage of obstetric admissions rising from five percent to 20 percent, respectively. However, in 1995, only 12 women with complications were seen. Despite the improvements in blood banking facilities, transfusions remained low. There was high staff turnover, low use of public services, and riots during 1993-94 which made sustaining the progress difficult[76].

D. KEBBI STATE, NIGERIA (PMM): District Hospital

ACTIVITIES

- ✔ Hired senior physicians (ob/gyn) as consultants to provide on-the-job training and deal with both normal and complicated cases.
- ✔ Provided equipment for the operating theater, labor suite, and lab.
- ✔ Trained midwives on life-saving and interpersonal skills.
- ✔ Trained physicians on emergency obstetric services, especially C-sections.
- ✔ Purchased emergency pack with essential drugs and supplies.
- ✔ At a later phase, educated the community on recognition of complications and stressed the need for prompt treatment and transport.

RESULTS

The number of C-sections increased from 101 in 1991 to 131 in 1995. The CFR among women dropped from 22 percent to five percent over the same period. The number of women with complications seen at the hospital increased from 200 in 1990 to 227 in 1994, then declined to 152 in 1995. A mini-survey showed knowledge gains of over 30 percent among men and women, however, utilization did not increase. The majority of the complications seen (68%) were hemorrhages, and complications of unsafe abortions. Maternal deaths fell from 44 in 1991 to 7 in 1995[90].

E. OGUN STATE, NIGERIA (PMM): District Hospital

ACTIVITIES

- ✔ Improved record keeping and quarterly maternal reviews.
- ✔ Provided equipment for the operating theater, labor suite, and lab.
- ✔ Provided refresher course for physicians and nursing staff.
- ✔ Purchased drug package and established a revolving fund.
- ✔ Established reliable electrical supply (generator), but problems were encountered in establishing a blood bank.
- ✔ At a later phase, mobilized the community on improving access, reducing delay in seeking care, training TBAs, promoting IE&C, and developing emergency funds.

RESULTS

The number of women with complications seen at the hospital decreased from 123 in 1992 to 55 in 1994, but increased to 91 in 1995. CFR was 6.6 percent in 1995 compared to 7.3 percent in 1992. Overall maternal admissions stayed about the same: 495 in 1992 and 439 in 1995. It was difficult to ensure that the doctor stayed. There were positions for three doctors but only one position was filled[91].

F. ZAIRA, NIGERIA (PMM): Teaching Hospital

ACTIVITIES

- ✔ Established an operating theater (autoclave and equipment) and restored a maternity ward.
- ✔ Installed a water supply.
- ✔ Trained midwives on life-saving skills.
- ✔ Introduced an emergency drug package with a revolving fund.
- ✔ Established ambulance service.
- ✔ Introduced blood donation system in antenatal care services (required booking).
- ✔ At a later phase, mobilized community on developing emergency loan funds.
- ✔ Established a transportation system with private drivers volunteering their time to respond to emergencies.

RESULTS

Twenty-three drivers pledged their full support and 58 pledged part-time participation. The admission to treatment interval was reduced by 57 percent from 3.7 hours in 1990 to 1.6 hours in 1995. The proportion of women treated in less than 30 minutes increased from 39 percent in 1993 to 87 percent in 1995. Drug availability increased from 10 percent to 80 percent. Case fatality rate among women with major obstetric complications fell from 14 percent in 1990 to 11 percent in 1995. However, the annual number of women with complications seen, declined from 326 in 1990 to 65 in 1995. This decline in use of public sector health services was due to a five-fold increase in fees and health worker strikes.

G. BO, SIERRA LEONE (PMM)

ACTIVITIES

- ✔ Refurbished hospital lab and trained technicians.
- ✔ Increased ability to store blood.
- ✔ Purchased drug package and established a revolving fund.
- ✔ At a later phase, mobilized the community to encourage blood donations.
- ✔ Posted vehicle at the hospital and motorcycles at the PHC units to facilitate transport during emergencies.

RESULTS

Two communities established community loan funds. There was no shortage of drugs and the project recovered 57 percent of the cost of the drugs. The number of blood donations drawn increased from 304 in 1992 to 501 in 1993, and the number actually transfused increased from 296 to 452 in the same time period. Case fatality rates for major obstetric complications fell from 13 percent in 1993 to 10 percent in 1995. About half the women with complications came to the health facility with the project vehicle[93].

H. MAKENI, SIERRA LEONE (PMM)

ACTIVITIES

- ✔ Conducted sensitization workshop.
- ✔ Provided training to physicians and nursing staff on life-saving skills.
- ✔ Provided services 24 hours a day by reshuffling schedules of staff.
- ✔ Renovated an operating theater with simple modifications.
- ✔ Purchased drug package and established a revolving fund.
- ✔ Established a blood bank with a stand-by generator.
- ✔ At a later phase, the project provided bicycles to foster the emergency transportation system and facilitation of referrals.
- ✔ Trained community to facilitate referrals. Provided four-wheel drive vehicle and two-way radio to facilitate transportation.
- ✔ Provided treatment before payment to ensure that resources were not a barrier.
- ✔ Provided supplemental salary for one year for the nursing staff.

RESULTS

Referrals by the community mobilizers dropped from a high of 24 percent to one percent in the first two years. The number of deliveries increased from 42 in 1990 to 82 in 1995. Women with complications seen at the hospital increased from 31 in 1990 to 98 in 1995. The case fatality rate among these women dropped from 32 percent to five percent. C-sections increased from two percent in 1990 to 38 percent in 1995.

VI. NEONATAL PROGRAMS

A. INDONESIA: Perinatal Regionalization Project, Tanjungsari, West Java

Tanjungsari is located in a rural sub-district of West Java with a population of 90,000. It is served by three government health centers with midwives and a district hospital 40 kms away. Villages in this mountainous area are connected by poor roads. While antenatal care services are well-utilized, TBAs are the main providers during childbirth and the post-partum period.

ACTIVITIES

- ✔ Trained TBAs to recognize maternal and neonatal complications.
- ✔ Established community birthing homes at the village level where the community nurse midwife (bidan di desa) could practice and potentially reside. These birthing homes were equipped with beds, scales, and supplies to conduct normal deliveries as well as child and reproductive health services. A two-way radio was installed to facilitate communication.
- ✔ Trained all maternity workers, formal and informal, at all levels of danger signs.
- ✔ Developed an IE&C strategy to improve awareness of the danger signs and purpose of the community birth centers.

RESULTS

TBAs are the main providers of delivery assistance in both areas, but the delivery site varied. In the intervention area 85 percent of women delivered at home compared to 96 percent of women in the control area. In the study area, 31 percent of women who had a complication delivered in health facilities compared to only 10 percent in the control area. TBAs in the intervention area referred 18 percent of the women who had intrapartum complications to the hospital compared to only nine percent in the control area. However, the TBAs enthusiasm for referring women in the intervention area fell as the project went forward[95].

B. INDIA: SEARCH

ACTIVITIES

WHO recommends that children under the age of two months experiencing Acute Lower Respiratory Infection (ALRI) should be treated in a hospital. An NGO, SEARCH, in India experimented with case management of pneumonia by village health workers (VHWs) and traditional birth attendants (TBAs). They trained (6 session/1.5 hours each) 25 male village health workers and 86 female TBAs on diagnosing pneumonia. The training was based on rapid respiratory rate (60 breaths a minute for the one month olds and 50 breaths a minute for the two month olds) nasal flaring and chest in-drawing. Because the TBAs were not literate or numerate they were trained to look for visible signs of distressed breathing. The project developed a breath counter (sand hour glass) which measured one minute and the TBAs

could move beads every time they counted to 10. It had five green beads and one red bead signaling rapid respiratory rate. Most TBAs could count to ten so, when they reached ten, they moved one of the five green beads. If they reached the red bead before the time was finished, it indicated a child with rapid respiratory rate needing treatment.

RESULTS

The majority of pneumonia cases occurred during the first month of life. The TBAs had the largest caseload with 50 newborns while the VHWs had 33. The TBAs also saw sicker children because many families refused to take the child to the health facility. Among the TBAs, "error-free cases" improved from 56 to 84 percent in two years. This technique had a 59 percent correlation when the respiratory rate was counted. For those that used the breath counter (hourglass) their diagnosis rose from 60 to 82 percent. Three TBAs had difficulty with the case management due to mental disabilities. If the three TBAs are excluded, the TBAs had a case fatality rate of (0.5) which is comparable to the VHWs CFR of (0.7). It should be noted that the TBAs had this CFR with a higher caseload of sicker children. Neonatal mortality due to pneumonia dropped by 44 percent[79].

C. INDIA: Government

ACTIVITIES

Low birth weight is a huge problem in India. Therefore, the government trained TBAs and Aganwandi workers (AWW) to assess low birth weight by foot length. The TBAs were trained on essential newborn care (e.g., warming, breathing resuscitation) and how to take a foot imprint of the newborn. The TBA monitored feeding, color of the soles of the feet, and activity. The AWW came on the day after the birth. If the foot size was less than 6.5 cm the baby was referred to the sub-center. If the newborn's foot size was between 6.5 -7.0 cm the AWW would make frequent follow-up visits to assess feeding and activity. She taught kangaroo warming and monitored the infant until the soles of the feet became pink.

RESULTS

As a result, use of antenatal care rose and birth registration increased. In addition, the infant mortality rate dropped from 58.1 in 1989-90 to 45.1 in 1990-93[96].

VII. CONCLUSION

This Chapter strives to disseminate the activities, results, and lessons learned from country programs, both their successes and struggles. We hope that these examples will give program managers direction regarding how programs have been designed and implemented, as well as, pointing out some of the pitfalls they may wish to avoid. More importantly, these programs demonstrate that progress can be achieved in terms of maternal and neonatal health when strategically selected interventions are implemented to meet the needs of the local community.

We believe that this complex problem of maternal and neonatal morbidity and mortality can be overcome if we all work together in a strategic and comprehensive manner.

GLOSSARY

Abortion
Spontaneous or induced expulsion of pregnancy products by the uterus before the 28th week of gestation, which terminates pregnancy.

Afterbirth
Lay term for placenta and fetal membranes expelled after childbirth.

Albuminuria/Proteinuria
The presence of albumin – a protein substance – in the urine which is often associated with pre-eclampsia and eclampsia.

Antenatal/Prenatal
The time period from conception until the onset of labor, about 40 weeks.

Antenatal Hemorrhage
Hemorrhage that occurs between conception and the onset of labor.

Assisted Removal of Placenta
Retained placenta can be removed manually or with the assistance of vacuum extraction.

Birth Asphyxia
An extreme condition in newborns caused by lack of oxygen and excess carbon dioxide in the blood, often resulting in the death of the fetus/newborn.

Breech Presentation/Breech Birth
When the fetus is lying in such a way that its buttocks are at the lowest end of the uterus, the fetus usually passes through the birth canal feet first.

Cesarean Section
An obstetric operation where by the fetus is removed through an abdominal incision of the uterus, usually after 28 weeks gestation.

Childbirth/Labor
First stage labor includes dilation of the cervix. Second stage encompasses delivery of the fetus. Third stage is expulsion of placenta and membranes.

Competency-based Training
A systematic approach to training in which a trainee learns the necessary knowledge and skills to execute a task. It is different from most trainings because there is not a quota for the number of procedures that need to be performed. The trainee repeats the task until they are proficient in performing the procedure.

DALYs
Disability Adjusted Life Years

Eclampsia/Toxemia
A severe condition, mostly in first pregnancies, characterized by albuminuria, hypertension, convulsions, brain and kidney damage, and often ends in death of the mother.

Edema
A condition where excess fluid is absorbed by body tissues. This is due to: 1) an excess production of body fluids; and/or 2) failure of proper excretion and absorption mechanisms.

Emergency Obstetric Care
The minimum amount of interventions needed to appropriately manage obstetrical complications. This includes surgical obstetrics (C-sections, treatment of lacerations, laparotomy), anesthesia, medical treatment of shock, eclampsia and anemia, blood replacement, manual procedures, and assisted delivery.

Episiotomy
An incision made during childbirth to the thinned-out vaginal opening to enlarge it and avoid overstretching, tearing, and damage to the pelvic floor.

Essential Obstetric Care
The minimum amount of interventions to promote a healthy pregnancy and birth outcome. This includes antenatal care (screening for infection, diseases, TT, good nutrition), birth planning, ensuring delivery with a skilled attendant, proper referral and management of obstetrical complications (emergency obstetric care), and post-partum monitoring and care.

Ergometrine
A drug, which is also found naturally in some teas and herbs, used to prevent or control bleeding. Its mechanism of action focuses on increasing uterine contractions.

First Referral Level
The level of the health system which is designed and equipped to provide comprehensive emergency obstetric care services.

Fistula
An abnormal passage between two cavities (vagina/bladder or vagina/rectum). The most common maternal fistula is vesico-vaginal fistula (VVF), an opening between the vagina and bladder which leaves the woman incontinent, susceptible to infection, and infertile.

Folic Acid
A Vitamin B complex nitrogenous acid needed for the development of normal red blood cells. Deficiency of folic acid before pregnancy can result in neural tubal defects in the newborn/fetus.

Gravida
The number of pregnancies, including stillbirths and abortions, a woman has had in her lifetime. Primigravida is a woman who is pregnant for the first time, while multigravida is a woman who has had more than one pregnancy.

Hemoglobin
A pigment (protein and iron) contained in red blood cells that carries oxygen through the blood.

Hemorrhage
Significant and uncontrolled loss of blood, either internally or externally, from the body.

Hypertension
High blood pressure, usually above 140 (systolic)/90 (diastolic).

Infertility
Inability to conceive or produce offspring.

Infibulation (a type of female genital mutilation)
A procedure that involves the removal of the clitoris, labia minora, and most of the labia majora, stitching together the wound edges of the labia majora to create a scarred surface.

Intrapartum
The time between the onset of the first stage of labor and completion of delivery, including delivery of the placenta.

Iron
A metallic element that is an important component of blood hemoglobin.

Maternal Mortality Rate
The number of women who die while pregnant or within the first 42 days after pregnancy, from any causes related to or aggravated by pregnancy, per 100,000 women of reproductive age in a given year.

$$\frac{\text{Number of Maternal Deaths in a Year}}{\text{100,000 Women of Reproductive Age in the Population}}$$

Maternal Mortality Ratio
The number of women who die while pregnant or within the first 42 days after pregnancy, from any causes related to or aggravated by pregnancy, per 100,000 live births in a given year.

$$\frac{\text{Number of Maternal Deaths in a Year}}{\text{100,000 Live Births in a Year}}$$

Maternity Waiting Home
A facility designed for pregnant women, with actual or potential complications, to await onset of labor near a health facility.

Newborn/Neonate
An infant from birth through the first 28 days of life. The neonatal period is the first 28 days after birth.

Neonatal Death Rate
The number of deaths in the first 28 days of life per 1,000 live births in a given year.

$$\frac{\text{Neonatal Deaths in First 28 Days of Life in a Year}}{\text{1,000 Live Births in a Year}}$$

Oxytocin
A pituitary hormone that stimulates contraction of the uterus and milk let-down reflex.

Oxytoxic
A term applied to any drug (e.g., erogmetrine) which stimulates contractions of the uterus in order to induce or accelerate labor.

Parenteral
A way to administrate drugs or fluids, either by intramuscular injections or intravenous infusion.

Para/Parity
The number of live births a woman has had in her lifetime. A primipara is a woman who has had one live birth and a multipara is a woman who has had many live births.

Partograph/Partogram
An instrument to record and monitor the progress of labor, including the timing of contractions, dilation of the cervix, and fetal heart rate.

Perinatal Mortality Rate
The number of deaths in the perinatal period from the 22th to 28th week of pregnancy through the first week of life. This includes the number of deaths during late pregnancy (22-40 weeks of gestation, including stillbirths) plus the number of deaths in the first seven days of life per 1,000 total births in a year.

$$\frac{\text{Number of Deaths Late in Pregnancy (from 22-40 weeks, including stillbirths) and in the First Seven Days of Life}}{\text{1,000 Live Births Plus Stillbirths in a Year}}$$

Placenta
A flat organ, usually 17-20 cm in diameter, formed in the 12th week of gestation to transmit oxygen and other vital nutrients to the fetus and remove waste products. The placenta is delivered in the third stage of labor. If parts of the placenta are retained it can cause post-partum hemorrhage.

Placenta Previa
An abnormally situated placenta, usually covering part of the entire cervix, which can contribute to post-partum hemorrhage and fetal distress.

Post-Partum Period
From delivery of the placenta through the first 42 days after delivery.

Post-Partum Hemorrhage (PPH)
A hemorrhage that occurs after childbirth, usually in the first 2 to 4 hours after delivery. It may occur after the placenta is delivered or be caused by retained placental pieces.

Pre-eclampsia/Toxemia
A condition characterized by fluid retention (edema), albuminuria, hypertension (rise of BP from 15-20mm over previous BP) which may lead to eclampsia.

Prolapsed Uterus
This occurs when the uterus protrudes into the lower part of the vagina as a result of stretching and weakening of the uterine ligaments.

Prolonged Labor
Labor lasting for more than 12 hours.

Puerperal Sepsis
Systemic infection resulting from a reproductive tract infection following childbirth, sometimes called "childbirth fever."

Retained Placenta
A condition where the placenta is not spontaneously or completely delivered after childbirth, resulting in an inability of the uterus to contract and causing post-partum hemorrhage.

Skilled Provider
A skilled provider is a doctor, midwife, or nurse who has completed a set course of study and can: manage normal labor and delivery, recognize the onset of maternal and neonatal complications, perform essential life saving skills, initiate treatment, and supervise the referral to a higher health care facility.

Stillborn
A baby that is born after the 22nd week of pregnancy but who has never taken a breath or shown any signs of life.

Transverse Lie
A condition where the fetus lies across the uterus instead of in the normal position with the head directed towards the cervix.

EXHIBITS

EXHIBIT 1

REASONS FOR MATERNAL MORTALITY/MORBIDITY

Combination of socio-cultural factors such as:

- ➔ Harmful Practices (e.g. FGM);
- ➔ Poor Nutrition and Associated Factors;
- ➔ Low Women's Status/Empowerment/Decision-Making;
- ➔ Frequent Pregnancies/High Fertility Rates/ Short Birth Intervals;
- ➔ Early Marriage and Adolescent Pregnancies;
- ➔ Heavy Workload;
- ➔ Reliance on Traditional Medicine and Healers;
- ➔ Desire for Small Babies; and
- ➔ Emotional Abuse/Violence.

Unmet need for family planning services due to:

- ➔ Traditional Beliefs/Practices;
- ➔ Lack of Knowledge; and
- ➔ Inaccessible or Poor Quality Services.

Delay in problem recognition due to:

- ➔ Traditional Beliefs;
- ➔ Low Perceived Risk;
- ➔ Low Knowledge of Causes of Death, Danger Signs, and Complications; and
- ➔ Inadequate Screening Programs.

Delay in deciding to seek care due to:

- ➔ Low Women's Status/Participation in Decision-Making;
- ➔ Lack of Birth Planning/Preparedness;
- ➔ High Rates of Unattended Home Births and Untrained Attendants; and
- ➔ Poor Quality (Perceived or Actual) of Health Services.

Delay in reaching the health facility due to:

- ➔ Geographic Distance;
- ➔ Lack of Resources to Pay for Services;
- ➔ Inadequate Communication/Transportation Systems; and
- ➔ Inadequate Knowledge of where to seek care and how to get to a facility.

Delay in receiving quality treatment at the health facility due to:

- ➔ Lack of Medicine, Supplies, Blood, and Equipment to Treat Complications;
- ➔ Cumbersome Administrative Processes;
- ➔ Lack of Competent, Motivated Personnel;
- ➔ Lack of Adequate Supervision and Management Information Systems; and
- ➔ Lack of Outreach and Follow-up Mechanisms.

EXHIBIT 2

REASONS FOR NEWBORN DEATHS

Combination of socio-cultural factors such as:

- ➔ Frequent Pregnancies/High Fertility Rates/Short Birth Intervals;
- ➔ Young Pregnancies;
- ➔ Desire for Small Babies; and
- ➔ Gender Discrimination Beginning in Infancy.

Delay in problem recognition due to:

- ➔ Traditional Beliefs;
- ➔ Low Knowledge of Danger Signs;
- ➔ Maternal Death; and
- ➔ High Rates of Unattended Home Births with/without untrained attendants.

Delay in deciding to seek care due to:

- ➔ Traditional Beliefs; and
- ➔ Low Knowledge of Medical Conditions/Consequences.

Delay in reaching the health facility due to:

- ➔ Lack of Resources to Pay for Services;
- ➔ Inadequate Communication and Transportation Systems; and
- ➔ Low Knowledge of where to seek care and how to get there.

Delay in receiving quality treatment at the health facility due to:

- ➔ Lack of Trained Personnel to Deal with LBW and Neonatal Infections;
- ➔ Lack of Supervision and Information Systems;
- ➔ Lack of Outreach and Follow-up Systems; and
- ➔ Lack of Medicines and Supplies to Properly Treat Complications.

EXHIBIT 3

KEY ELEMENTS OF BIRTH PLANNING/PREGNANCY PREPAREDNESS

- ✔ Inform women on what they should expect during pregnancy, including their expected date of delivery and self-care during pregnancy (e.g., nutrition and reduction of worldload).
- ✔ Know and recognize danger signs for the mother during pregnancy, childbirth, and the post-partum period.
- ✔ Promote the importance of having a skilled provider attend their delivery.
- ✔ Know which health facility to go to if a complication arises.
- ✔ Know how to get to that facility.
- ✔ Encourage the development of a plan to pay (savings/loan) for those services.
- ✔ Understand the importance of immediate and exclusive breastfeeding.
- ✔ Educate women and their families to recognize the danger signs for newborns.
- ✔ Educate women about their return to fertility and FP options available to them.

EXHIBIT 4

DANGER SIGNS FOR WOMEN

SEEK IMMEDIATE ATTENTION		
PREGNANCY	**CHILDBIRTH**	**POSTPARTUM**
Bleeding	Heavy Bleeding	Heavy Bleeding
Convulsions	Convulsions	Convulsions
Pale, Labored Breathing	Fevers, Chills, Discharge	Fever, Chills,
Headache	Labor Longer than 12 Hours	Discharge
Swollen Hands/Face	Malpresentations	
High Fever	Placenta Not Delivered	
Severe Abdominal Pain	in 30 Minutes	

Source: WHO, 1994

EXHIBIT 5

DANGER SIGNS FOR NEWBORNS

SEEK IMMEDIATE ATTENTION	
AT BIRTH	**FIRST 7 DAYS**
Not Breathing	Hypothermia/Fever/Chills
Skin Color is Yellow (jaundice)	Jaundice
Skin Color, Palm and Soles of Feet are Blue (Hypothermia)	Labored Breathing (greater than 60)
	Convulsions
Unable to Suck	Unable to or Poor Sucking/Not Active
	Rigidity
	Diarrhea/Constipation
	Red Swollen Eyes with Discharge
	Redness and Discharge around the Cord

Source: WHO, 1996

RISK ASSESSMENT TOOL FOR MATERNAL AND NEONATAL HEALTH

PROBLEM NEED	DATA	VERY POOR SETTING	POOR SETTING	MODERATE SETTING	HIGH SETTING	VERY HIGH SETTING
	Environment					
Inadequate/unsupportive policies	Policy	SM policy passed in the last year	SM policy passed in the last 2 years	SM policy passed in the last 3 years	SM policy passed in the last 4 years	SM policy passed in the last 5 years of more
Low Women's Status Limited education	(% of female literacy)	Less than 20%	21% - 35%	36% - 50%	51% - 65%	More than 65%
Limited access to resources reducing access to care	Access to resources	No access to resources	Limited access to resources	Some access to resources		Access to resources
Limited participation in decision-making inhibiting seeking and obtaining care	Women's participation in decision-making	No decision-making	Limited participation decision-making	Some participation decision-making	Some independent decision-making	Independent decision-making
Limited mobility hindering access to care	Mobility	Isolated	Mobile with male relatives only	Mobile with others	Mobile with permission	Mobile alone
	Infrastructure					
Poor access	Average distance/time to health source	More than 12 kms	11 - 8 km	7 - 5 km	4 - 2 km	Less than 1 lm
Poor access	Doctors per 10,000 population (All)	1 - 5	6 - 15	16 - 30	31 - 45	More than 45
Poor access	Number of health facilities per 500,000 that provide B-EOC/C-EOC	1 None	2 1	3 1	4 1 - 2	5 or more More than 2
	Health Status					
Poor access to quality MH services	Maternal Mortality Ratio	More than 650	649 - 500	499 - 350	349 - 200	Less than 200
Poor access to quality MH services, newborn care	Infant Mortality Rate	More than 100	99 - 80	79 - 65	64 - 50	Less than 50
Poor access to quality FP services	Total Fertility Rate	More than 6	5.9 - 5.0	4.9 - 4.0	3.9 - 3.0	Less than 3

Source: Adapted from the World Bank, Tinker, 1993; Prepared by Susan Rae Ross, CARE RTA, Nov., 1998; SM = Safe Motherhood
Note: this table is still in draft format and will continue to be tested in the next year.

RISK ASSESSMENT TOOL FOR MATERNAL AND NEONATAL HEALTH

PROBLEM NEED	DATA	VERY POOR SETTING	POOR SETTING	MODERATE SETTING	HIGH SETTING	VERY HIGH SETTING
	Health Infrastructure					
Poor access to MH services	% of women that attend at at least 3 antenatal care visits	Less than 20%	21% - 35%	36% - 50%	51% - 65%	More than 65%
Preference, poor perception or poor access to MH	% Home births	More than 60%	60% - 45%	44% - 30%	29% - 15%	Less than 15%
Inadequate number of trained staff, deployment and access to competently trained providers	% of women who have a skilled provider attend their birth	Less than 20%	21% - 35%	36% - 50%	51% - 65%	More than 65%
Poor access	% of overall institutional deliveries	Less than 20%	21% - 35%	36% - 50%	51% - 65%	More than 65%
Beliefs, access to and quality of MH services	% of women with complications that deliver in an institution (met obstetric need)	Less than 3%	4% - 6%	7% - 10%	11% - 13%	More than 13%
Poor access	% of women who receive a post-partum visit in the first 24 hours	Less than 20%	21% - 25%	36% - 50%	51% - 65%	More than 65%
Poor access and distribution	% women who receive PP Vitamin A supplementation	Less than 20%	2% - 35%	36% - 50%	51% - 65%	More than 65%
Misinformation, poor access to and quality of FP services	Contraceptive prevalence rate of modern methods	Less than 10%	15% - 25%	26% - 35%	36% - 45%	More than 45%
Poor access to and quality of FP services	Unmet need for FP both limiting/spacing	More than 30%	30% - 25%	24% - 20%	19% - 15%	Less than 15%
Inadequate nutrition, poor access to health services and distribution of systems	% pregnant anemic women	More than 60%	60% - 45%	44% - 30%	29% - 15%	Less than 15%
Poor access to identification and treatment services	Syphilis prevalence among antenatal women	More than 9%	Between 9% - 7%	Between 6% - 4%	Between 3% - 1%	Less than 1%

Source: Adapted from the World Bank, Tinker, 1993; Prepared by Susan Rae Ross, CARE RTA, Nov., 1998
Note: this table is still in draft format and will continue to be tested in the next year.

RISK ASSESSMENT TOOL FOR MATERNAL AND NEONATAL HEALTH

PROBLEM NEED	DATA	VERY POOR SETTING	POOR SETTING	MODERATE SETTING	HIGH SETTING	VERY HIGH SETTING
	Neonatal Health Status					
Poor access and distribution	% of TT coverage	Less than 25%	26% - 40%	41% - 55%	56% - 70%	More than 70%
Poor access to quality maternal and newborn services	Neonatal deaths as a proportion of IMR	More than 50%	49% - 40%	39% - 30%	29% - 20%	Less than 20%
Poor maternal nutrition	% of LBW	More than 40%	39% - 30%	29% - 20%	19% - 10%	Less than 10%
	IE&C					
Poor education levels, health education, and counseling	% of women who know of a FP source	Less than 20%	21% - 35%	36% - 50%	51% - 75%	More than 75%
Poor education levels, health education, and counseling	% of couples with birth plans	Less than 5%	6% - 15%	16% - 25%	26% - 40%	More than 40%
Poor education levels, health education, and counseling	% of women who know danger signs	Less than 20%	21% - 35%	36% - 50%	51% - 75%	More than 75%
Poor education levels, health education, and counseling	% of caretakers who know a source for newborn care	Less than 20%	21% - 35%	36% - 50%	51% - 75%	More than 75%

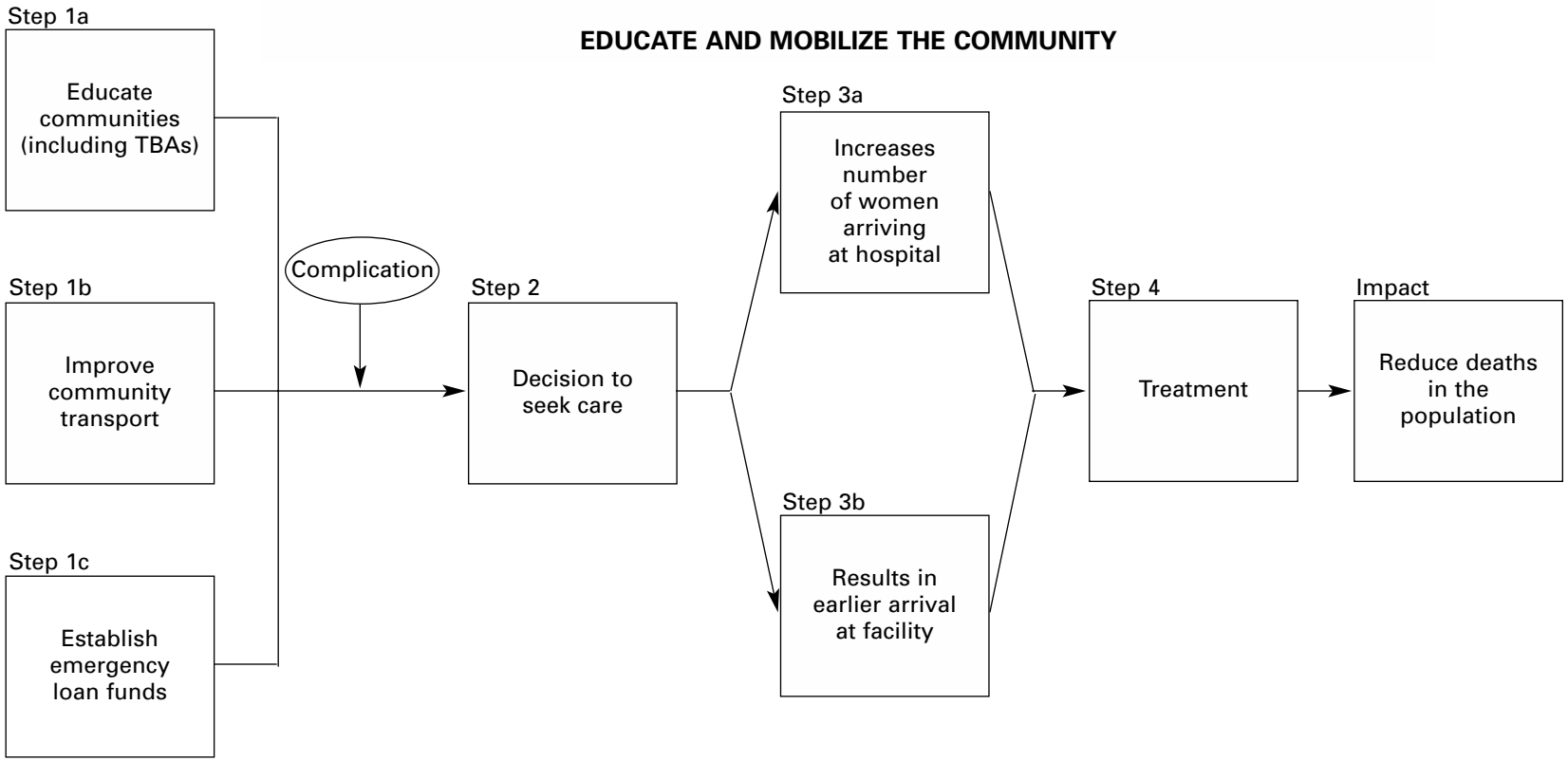
Source: Adapted from the World Bank, Tinker, 1993; Prepared by Susan Rae Ross, CARE RTA, Nov., 1998
Note: this table is still in draft format and will continue to be tested in the next year.

EXHIBIT 6 (cont.)

ILLUSTRATIVE LIST OF INDICATORS

INDICATOR	DATA SOURCE	LEVEL OF INDICATOR
% of pregnant women that receive ANC (1,2,3 visits).	Service Records	Effect
% of pregnant women that receive 2 Tetanus vaccines.	Service Records	Effect
% of pregnant women that receive iron tablets.	Service Records	Effect
% of pregnant women that receive FP counseling during ANC visits.	Service Records/Survey	Effect
% of pregnant women that have a birth plan.	Survey	Effect
% of pregnant women that know at least 2 danger signs.	Survey/FGD	Output
% of husbands or in-laws that know at least 2 danger signs.	Survey/FGD	Output
% of TBAs that know at least 5 danger signs.	Post-test	Output
% of pregnant women and families that know how to get to the nearest health facility if a complication arises.	Survey	Output
% of pregnant women that deliver at home with a trained attendant.	Service Records/Survey	Output
% of pregnant women that deliver at home using a clean birth kit/materials.	Service Records/Survey	Output
% of pregnant women who have complications that deliver in the facility.	Service Records	Effect
% of providers that have adequate knowledge on how to manage complications.	Post-test Scores	Output
# of facilities that are equipped to provide basic obstetric care.	Facility Records	Output
# of facilities that are equipped to provide comprehensive obstetric care.	Facility Records	Output
# of facilities that have at least one month of supplies to treat obstetrical complications on a regular basis.	Inventory Records	Input
case fatality rates (% of pregnant women with complications that die compared to the total number of cases).	Service Records/ Case Reviews	Effect
% of TBAs that know the 5 elements of good newborn care.	Post-test	Output
% of women who begin breastfeeding within the first hour.	Service Records/Survey	Effect
% of pregnant women and their families that know at least 2 danger signs for newborns.	Survey	Output
% of women that are visited by a trained attendant in the first 48 hours.	Survey	Effect
% of women that receive post-partum FP services.	Survey	Effect

Source: Maine, The Design and Evaluation of Maternal Health Programs, 1998; UNICEF Maternal Mortality Guidelines, 1996

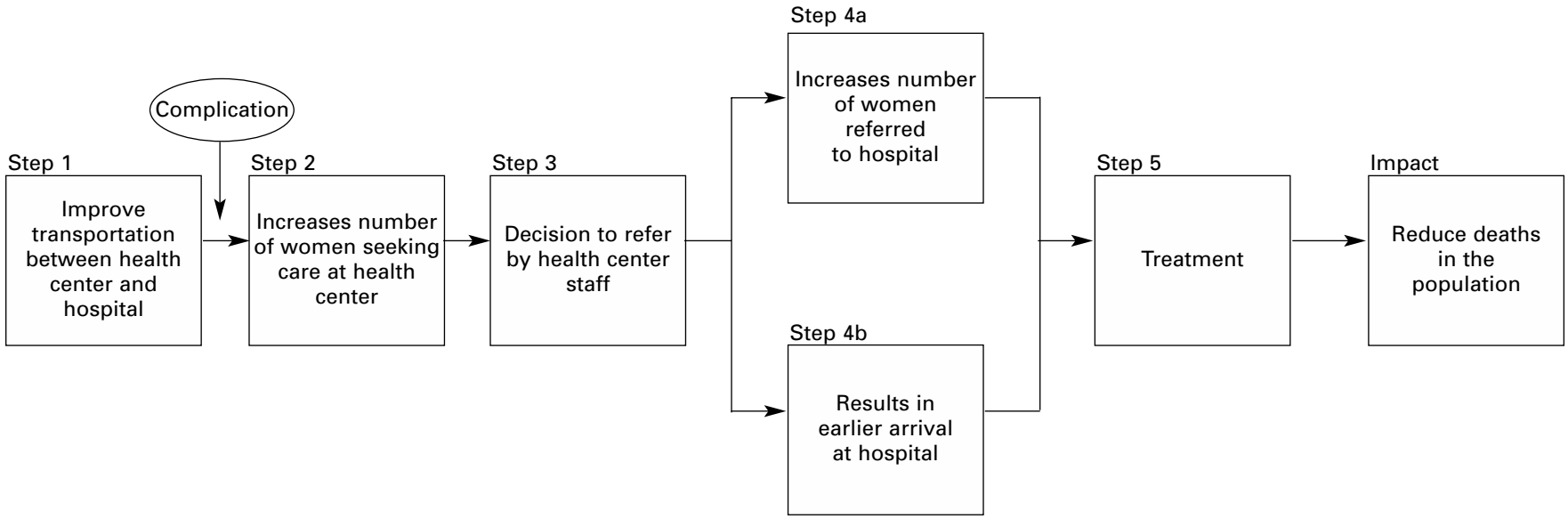


STEP	PROCESS/OUTPUT INDICATORS	DATA SOURCES
1a	Number of sessions held; number of people educated Knowledge of danger signs of complications	Project staff reports; attendance lists Pre- and post-tests/mini-surveys
1b	Availability of community transport Utilization of community transport	Village leader interviews; project staff reports Patient interviews; transport records
1c	Availability of emergency loans Utilization of emergency loans	Village leader interviews; project staff reports Village leader interviews; fund records
2	Decision to seek care	Community focus groups; mini-surveys
3a	Number of women with complications arriving at facility	Health facility data
3b	Condition on arrival	Health facility data
4	Case fatality rate	Hospital data

Source: Maine, 1997

EXHIBIT 8

IMPROVE TRANSPORTATION BETWEEN THE HEALTH CENTER AND HOSPITAL

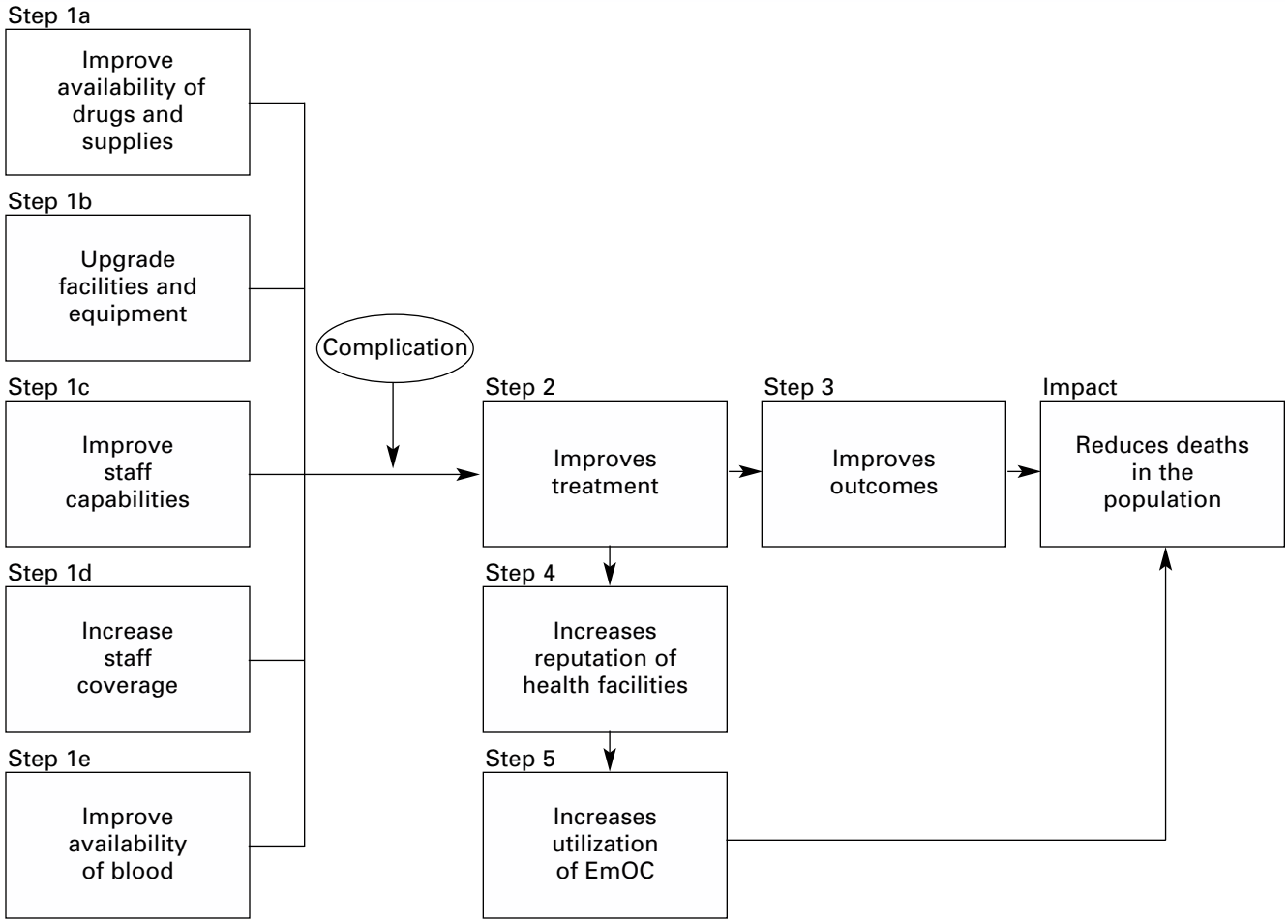


STEP	PROCESS/OUTPUT INDICATORS	DATA SOURCES
1	Availability of transport Utilization of transport	Checklist data; project staff reports Transport vehicle log; interviews with community and leaders
2	Number of women with complications arriving at health center	Health center data
3	Decision to refer	Interviews with health center staff; health center data
4a	Number of completed referrals	Health center and hospital data
4b	Condition on arrival Time from referral to arrival at hospital	Case reviews; health center and hospital data; vehicle log Hospital data
5	Case fatality rate	Hospital data

Source: Maine, 1997

EXHIBIT 10

IMPROVE AVAILABILITY AND QUALITY OF HEALTH SERVICES



STEP	PROCESS/OUTPUT INDICATORS	DATA SOURCES
1a	Availability of drugs and supplies Utilization of drugs and supplies	Checklist data Health facility data
1b	Availability of upgraded EmOC facilities/equipment Utilization of upgraded EmOC facilities/equipment	Project staff reports; staff interviews Health facility data
1c	Number of staff trained Improved staff capabilities	Project staff reports Pre- and post-tests; case reviews
1d	Proportion of hours per week with skilled person on call Proportion of hours per week with skilled person on site	Staff schedule; project staff reports Staff schedule; project staff reports
1e	Availability of blood Utilization of blood	Checklist data Blood bank log
2	Time from arrival to definitive treatment Number of C-sections (or other procedures) performed	Case reviews; time-motion studies Operating theatre log
3	Case fatality rate	Health facility data
4	Reputation of health system in community	Pre- and post-tests; mini-surveys
5	Number of women with complications admitted to facility	Health facility data

Source: Maine, 1997

EXHIBIT 11
INTER-SECTORAL ACTION NEEDED TO PROMOTE SAFE MOTHERHOOD

SECTORS/AGENCIES/PERSONNEL	EXAMPLES OF INTER-SECTORAL ACTION
1. **District Authorities** Local Government Officials Information Officers Political Leaders	• Participate in and provide venue for Safe Motherhood workshops. • Provide materials for building/renovating maternity wards. • Provide payment for community nurse-midwives.
2. **District Agricultural Department** Nutritionists Home Economists Agricultural Field Workers	• Provide seeds and expertise to women's groups growing vitamin rich vegetables (e.g., iron, Vitamins A and C). • Educate families on the nutritional needs of pregnant and nursing women.
3. **Agricultural/Commercial Cooperatives**	• Provide additional food to pregnant/lactating women through cooperatives. • Use commercial vehicles for transportation of women during an obstetric emergency. • Establish and maintain an annual fund for social welfare to access transportation or pay for services.
4. **Farmer and Worker Unions**	• Provide food subsidies to local health workers (e.g., community nurse-midwife). • Participate in scheme for low-cost sale of protein-rich foods to poorest pregnant and nursing women (e.g., eggs, chickens).
5. **District Community Development Department**	• Develop income-generating activities with women's groups to fund transport for emergency referrals. • Stimulate community action to build maternity waiting homes.
6. **Women's Unions/Groups**	• Participate with local health staff and voluntary health workers as part of community-based network for Safe Motherhood. • Provide female education on human sexuality, family planning, pregnancy, delivery, and post-natal care. • Encourage role plays comparing unsafe and safe delivery techniques.
7. **Youth Unions/Groups**	• Promote minimum marriage age (e.g., female 18 years). • Enable sexually active youths to use contraceptives to avoid unwanted pregnancies, STIs, and HIV/AIDS.
8. **District Education** Secondary Schools Primary Schools Teacher Training Colleges	• Within family life education, promote understanding of human sexuality, conception, FP, pregnancy, and childbirth. • Encourage and enable female children to attend primary school. • Train teachers in appropriate content and teaching methods for Safe Motherhood.
9. **Adult Education and Literacy Department**	• Involve mothers-in-law in female education sessions to communicate Safe Motherhood messages. • Produce literacy primers on Safe Motherhood themes. • Enable women to discuss sensitive and hidden issues like maternal morbidity and (induced) abortion.
10. **Industry** Pharmaceutical/Other Manufacturers	• Enable wholesale purchase of obstetric drugs for lower cost retail to poorer women and health facilities. • Develop and provide low-cost dressings and sanitary pads to improve genital hygiene during and after delivery.
11. **Commerce/Business** Local Government Officials Information Officers Political Leaders	• Enable retail outlets to display and market simple low-cost birth kits along with family planning supplies. • Donate equipment and transport for Safe Motherhood activities in remote areas.
12. **Private Health Sector** Western Practitioners Traditional Practitioners	• Provide information and services (e.g., antenatal, delivery post-partum, and induced abortion care). • Participate in identifying beneficial and harmful delivery and abortion practices.
13. **Transport**	• Use vehicles for transportation in obstetric emergency. • Participate with women's groups to establish and maintain fund for emergency transport.
14. **PVOs/NGOs**	• Donate equipment (e.g., blood pressure machines). • Provide information and services. • Sponsor renovation of operating theaters or bicycles for rural midwives.
15. **Religious Organizations**	• Local religious leaders permit/encourage discussion of contraception/abortion/female circumcision. • Encourage access to maternal health services.

Source: Feuerstein, 1995

EXHIBIT 12

Current Best Practices

QUALITY MATERNAL HEALTH SERVICES

1. **Promotion and protection of health:** Women and their families need to know about pregnancy and childbirth, understand the danger signs, know where they can obtain services and how to get to the facility.

2. **Accessibility and availability of services:** Women should be able to access a full range of prompt quality services, provided by technically competent providers, at the lowest appropriate level in the health system.

3. **Acceptability of services:** Women need privacy and many prefer a female provider. They should be assured of confidentiality and have the support of their family members. Health providers should respect cultural beliefs and practices.

4. **Technical competence of health care providers:** Technical competence depends on regular training/retraining and clear guidelines for clinical treatment. Supervision and case reviews are also essential to sustain technical competency.

5. **Essential supplies and equipment:** Inventory control and logistics management standards should be established. This will ensure that necessary supplies and equipment at each level will be available on a regular basis.

6. **Provider interaction:** Providers must offer accurate, appropriate information, treat clients with respect, be responsive to their needs and avoid judgmental attitudes.

7. **Information and counseling for the client:** Clients should have the opportunity to talk and ask questions with the health care providers and should be offered guidance on any health problem that is identified.

8. **Involvement of clients in decision-making:** Providers should see clients as partners in health care and should involve them in decision-making as active participants in their own health care.

9. **Comprehensiveness of care and linkages to other reproductive health services:** Maternal health care has a unique opportunity to provide women with comprehensive reproductive health care and address other issues, such as nutrition and STIs.

10. **Continuity of care and follow-up:** Maternal health services should be part of a comprehensive program including antenatal, delivery, and postpartum care. Women must be seen as people with health needs that continue throughout their lives.

11. **Support to health care providers:** Health care providers at all levels need the economic and social support of the State and the communities in which they work.

Source: WHO, 1994

EXHIBIT 13

Current Best Practices
PRE-CONCEPTION

RECOMMENDED SERVICES

1. Health education/counseling on reproduction
2. Access to FP services (clinical, CBD, social marketing)
3. Nutrition for adolescent girls including micronutrients (Vitamins A & C, Iron, Iodine)
4. Screening and treatment for STIs/RTIs
5. Community mobilization/support
6. Quality of care
7. Functional management systems to support referrals

LONG-TERM

1. Income generation
2. Girls' education
3. Women's empowerment/decision making
4. Caring practices, such as dealing with FGM and child labor

EXHIBIT 14

Current Best Practices
PREGNANCY

Every women must know that she may develop a pregnancy-related complication, each time she becomes pregnant.

BIRTH PLANNING: Planning is needed to ensure that women have safe, healthy pregnancies. This may mean that she has a clean delivery with a skilled provider (e.g., midwife, doctor). It also means that women and their families can identify danger signs, know which facility to go to,know how to get to the nearest appropriate facility, and can mobilize resources (transportation, money, or blood) to access those services.

SCREENING: Screening for complications – instead of the "at risk" approach – is needed to quickly identify women with complications and make the necessary arrangements to refer them in a timely manner to an appropriate facility. In addition, current screening parameters (the "four toos") need to be refined to enhance their accuracy in identifying women who may develop complications.

CLEAN BIRTHS: All women are entitled to a clean delivery (6 cleans), at home or in the hospital, by a skilled provider. This also includes keeping the baby clean, dry, warm and providing immediate breastfeeding.

POST-PARTUM CARE: All women should be educated about the danger signs and closely monitored for the first 24 hours.

NEWBORN CARE: Newborns should be closely monitored for the first week placing attention on breathing, immediate breastfeeding, cord and eye care, and keeping the baby dry, clean, and warm.

MATERNAL DANGER SIGNS
SEEK IMMEDIATE ATTENTION

PREGNANCY	CHILDBIRTH	POST-PARTUM
Bleeding	Heavy bleeding	Heavy bleeding
Convulsions	Convulsions	Convulsions
Pale, labored breathing	Fevers, chills, discharge	Fever, chills
Headache	Labor longer than 12 hours	Discharge
Swollen hands/face	Malpresentations	
High fever	Placenta not delivered in 30 minutes	

EXHIBIT 15

Current Best Practices
PREGNANCY

1. ANTENATAL CARE (ESSENTIAL SERVICES)

- TT Immunization
- Treatment of Anemia
- Treatment of Infections in Endemic Areas (e.g., Malaria, Hookworm)
- Screening and Treatment/Referral (syndromic management) for STIs/RTIs, especially syphilis
- Four visits if possible: Good history that identifies previous pregnancy-related complications, physical information (fundus, position of the fetus), BP (especially after week 28), and weight, if possible
- Health Education (nutrition, reduce workload, return to fertility, FP, immediate and exclusive BF, and symptoms of STIs)
- Birth Planning
  - ➔ What can be expected during pregnancy (date of delivery)
  - ➔ Nutrition counseling/encourage reduction of workload
  - ➔ Know/identify danger signs in pregnancy, childbirth, and post-partum periods
  - ➔ Select and use skilled provider/mobilize materials for clean birth
  - ➔ Know/plan which health facility to go to, how to get transport, and how to mobilize resources to pay for transport, supplies and services, if complications arise
  - ➔ Know about the importance of immediate and successful breastfeeding
  - ➔ Know about danger signs in the newborn
  - ➔ Know about post-partum FP services (return to fertility).
- Antenatal care card

2. ANTENATAL CARE (IDEAL BUT MAY NOT BE FEASIBLE)

- Urine Analysis (Albumin and Diabetes)
- Hemoglobin/Hemocrit
- Counseling and Testing for HIV

3. COMMUNITY SUPPORT SYSTEMS

- Support outreach services
- Develop transportation systems
- Develop community health savings and loan programs
- Develop community blood donation system
- Minimize harmful practices and encourage beneficial practices

MICRONUTRIENT SUPPLEMENTATION

MICRONUTRIENT	WRA	ANTENATAL	POST-PARTUM
Iron – Mild Anemia[1] (Hg less 11 gm)	60 mg	60 mg (90-100 tabs)	60 mg
Iron – Moderate/High[1] (Hg range of 7-10 gm)	120 mg	120 mg	120 mg
Iron – Severe[1] (Hg less than 7 gm)	120 mg	180 mg for 4 weeks, then 120 mg	120 mg
Folic Acid Mild Anemia[1]	250 mcg	250 mcg	250 mcg
Folic Acid Moderate/High Anemia[1]	500 mcg	500 mcg	500 mcg
Folic Acid Severe Anemia[1]	500 mcg	750 mcg for 4 weeks then 500 mcg	500 mcg
Vitamin A[2] Deficiency (VAD)	Supplement women w/VAD Not to exceed 10,000 IU daily	Supplementation for women with VAD only Not to exceed 10,000 IUs daily	200,000 IUs single dose first month
Calcium[3] Deficiency	1,200 mg	1,200 mg	1,200 mg
Zinc[3] Deficiency	12 mg	15 mg	19 mg
Iodine[4] Deficiency	400-960 mg	100-300 mg (oil)	100-300 mg (oil)

Source: (1) WHO, 1995; (2), WHO, 1998; (3) MotherCare 1997; (4) WHO, 1996. (IM): intramuscular; (IUs): international units, (MU): million units, (mcg) micrograms; (mg) milligrams
VAD – Vitamin A Deficiency

EXHIBIT 17

PREFERRED TREATMENT PROTOCOLS FOR PREGNANT WOMEN AND NEWBORNS

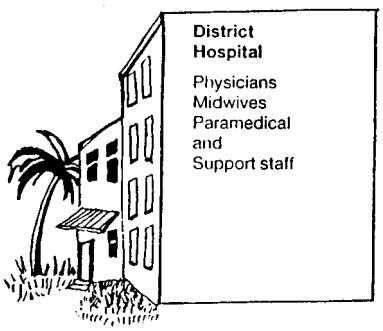
DISEASE	CIPROFLOXACIN	CEFTRIAXZONE	PENICILLIN	TETRACYCLINE	DOXYCYCLINE
Maternal Syphilis	NA	NA	2.4 MU IM Benzathine or 1.2 MU IM of procaine	NA	NA
Maternal Gonorrhea	500 mg po	250 mg IM	NA	NA	NA
Maternal Chlamydia	NA	NA	NA	500 mg po 4x day for 7 days	500 mg po 4x day for 7 days
Ophthalmia Neonatorum	NA	50 mg/kg IM	NA	1% ointment for 10 days	NA
Congenital Syphilis	NA	NA	50,000 Units of procaine IM	NA	NA

Source: Family Health International, 1996
MU= million units; PO= by mouth; mg= milligram; IM= intramuscular; NA= Not Applicable

EXHIBIT 18

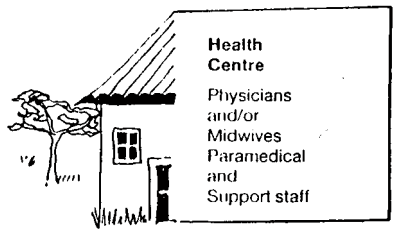
Comprehensive Emergency Obstetric Care Facilities
One Facility per 500,000 people

- Perform surgery under general anesthesia.
- Perform assisted removal (e.g., D&C) of retained placental pieces.
- Perform manual removal of retained placental pieces.
- Perform assisted vaginal delivery (e.g., vacuum extraction or forceps delivery).
- Provide blood replacement.
- Administer parenteral (IV or IM) antibiotics.
- Administer parenteral (IV or IM) sedatives.
- Administer parenteral (IV or IM) oxytocics.



Basic Emergency Obstetric Care Facilities
Four Facilities per 500,000 people

- Perform manual removal of retained placental.
- Perform assisted vaginal delivery (e.g., vacuum extraction).
- Administer antibiotics, sedatives (Valium, Magnesium Sulfate) and oxytocics (Ergometrine, Pitocin) IM or IV and IV fluids.



Obstetric First Aid in the Community

- Uterine massage/pressure points.
- May be able to administer sub-lingual/nasal/IM oxtyocics (Ergometrine).
- Provide Oral Rehydration Salts.

EXHIBIT 19

Current Best Practices
CHILDBIRTH/MANAGEMENT OF PREGNANCY OUTCOME

NORMAL HOME DELIVERY

- ➔ Use of skilled provider/clean delivery practices (6 cleans)
- ➔ Minimize harmful practices and encourage beneficial practices
- ➔ Immediate breastfeeding*
- ➔ Adequate newborn care (breathing, warm, dry, cord care and eye care)

COMPLICATED DELIVERIES

- ➔ Minimize harmful practices and encourage beneficial practices
- ➔ Timely identification of complications (bleeding, fever, labor longer than 8 hours, generalized swelling, fever) and promptly seeking care
- ➔ Prompt mobilization of resources (e.g., money, transportation, and blood donation)
- ➔ Obstetric first aid in the community (e.g., bi-manual compression, ORS, nasal/sub-lingual oxtoycics)
- ➔ Existence of functional EOC services (e.g., adequate drugs, medical supplies, equipment, trained personnel, MIS system, and supervision)

  Basic obstetrical services (Health Centers)
  - ✔ IV Fluids, antibiotics, anticonvulsants, oxytocics
  - ✔ Manual removal of retained placenta/pieces
  - ✔ Assisted vaginal deliveries (e.g., forceps)

  Comprehensive obstetric services (Including Basic Hospitals)
  - ✔ Blood transfusion
  - ✔ Surgery/anesthesia (e.g., D&C or C-Section)

- ➔ Access to quality EOC Services
  - ✔ Informed choice about all procedures/treatments
  - ✔ Privacy during examination, ideally by a female provider
  - ✔ Treated within at least one hour of admission
  - ✔ Women Friendly Centers with services available 24 hours a day
  - ✔ Referral and follow-up of women with complications after discharge.

- ➔ Immediate Breastfeeding
- ➔ Adequate newborn care (e.g., breathing, warm, dry, cord care, and eye care)

* Women who know they are HIV positive should be counseled about the potential risk of transmission through breastmilk and decide if they want to breastfeed and look for appropriate alternatives, if needed.

EXHIBIT 20

ELEMENTS OF A CLEAN BIRTH: THE SIX CLEANS

- ✔ Clean surface
- ✔ Clean string to tie the cord
- ✔ Attendant with clean hands
- ✔ Clean blade to cut the cord
- ✔ Clean cloth to wrap the baby in
- ✔ Clean cloth for the mother

Source: WHO, 1996

EXHIBIT 21

EMERGENCY!!! WHAT CAN THE TRAINED TBA DO?

DURING PREGNANCY	
Vaginal bleeding	✔ Encourage the woman to consult with a doctor ✔ Explain to the family why the woman should avoid heavy manual work
Swelling of face and hands	✔ Encourage the woman to consult with a doctor ✔ Explain to the husband why the woman must rest
No antenatal care and baby is breech or transverse between 34-40 weeks	✔ Urge women to deliver in the hospital ✔ Explain to the husband why they should deliver in the hospital
DURING LABOR AND DELIVERY	
Labor for more than 12 hours	✔ Assist family to arrange rapid referral ✔ Keep woman warm, drinking clear liquids
Cord tightly around baby's neck	✔ Gently slip cord over baby's head to avoid cord compression but do not force
Vaginal laceration	✔ For a small tear use clean cloths to apply pressure and stop bleeding ✔ For deeper tear or when bleeding does not stop, apply pressure with clean cloths and accompany family to health facility
AFTER DELIVERY	
Baby depressed	✔ Keep the baby dry and warm ✔ Remove secretions from the mouth ✔ Stimulate baby ✔ Mouth-to mouth resuscitation, if needed
Placenta not delivered in 30 minutes	✔ Urge woman to pass urine ✔ Check contraction (firmness) of uterus ✔ Put baby to breast to suckle ✔ If bleeding persists, help family to refer woman to hospital
Heavy vaginal bleeding after contract	✔ Rub the woman's abdomen to help the uterus (NOT HARD) ✔ Assist family to refer woman right away ✔ Keep woman warm and drinking clear liquids (ORS) ✔ Give oxytocics if trained and available
Fever, blood-stained vaginal discharge	✔ Give antibiotics to the woman ✔ Explain about cleanliness of genital area ✔ Explain danger of infection spreading to woman's bloodstream without treatment

Source: Feuerstein, 1995

EXHIBIT 22

Current Best Practices
POST-PARTUM MATERNAL

Normal Maternal

➔ Monitor mother and newborn

IDEAL		RECOMMENDED	
First Visit	**First 6 hours**	**First Visit**	**In first 24 hours**
Second Vsiit	**3 days after birth**	**Second Visit**	**3 to 5 days after birth**
Third Visit	**14 days after birth**	**Third Visit**	**40th day after birth**
Fourth Visit	**40th day after birth**		

➔ Minimize harmful practices and encourage beneficial practices.
➔ Post-partum Vitamin A Supplementation (200,000 IUs) in the first month.
➔ Post-partum FP (mini-pill, IUD, VSC immediately, other after 6 weeks).
➔ Breast care

DANGER SIGNS TO BE MONITORED

➔ **Post-partum Hemorrhage**
- ✔ Heavy bleeding (e.g., soaking one pad/cloth every hour in the first 8 hours, soaking 1 pad/cloth every 2 hours in second 8 hours)
- ✔ Shock (e.g., sweating, cool, clammy, fainting, rapid weak pulse)
- ✔ Atonic (Soft) uterus
- ✔ Tears/laceration

➔ **Retained Placenta**
- ✔ No sign of placental separation (lengthening of the cord, gush of blood) within 15 minutes after delivery
- ✔ Placenta not delivered within 30 minutes after delivery
- ✔ Atonic uterus/heavy bleeding

➔ **Sepsis**
- ✔ Fever with or without chills (3-5 days usually)
- ✔ Foul smelling/change in discharge
- ✔ Uterus tenderness/atonic uterus
- ✔ Convulsions/ridgity

➔ **Eclampsia**
- ✔ Facial and/or hand edema (not swelling of ankles)
- ✔ Elevated blood pressure
- ✔ Headache, visual disturbances, delirium convulsions
- ✔ Decreased urine output

Complicated Maternal

➔ Access to EOC services (treatment of complications and infections, and morbidities such as fistula, uterine prolapse and lacerations).
➔ Minimize harmful practices and encourage beneficial practices.

EXHIBIT 23

Current Best Practices
POST-PARTUM MATERNAL CARE

DANGER SIGNS: 24 HOURS POST-PARTUM

Danger Sign	Home Delivery Individual	Home Delivery Household	Home Delivery Community Resource Person	Delivery at Institution
Heavy bleeding	♦	*	*	♦
Atonic uterus	*	*	♦	♦
Placenta (retained)		*	♦	♦
Placenta (partial delivery)			♦	♦
Shock (fainting, cool, clammy)		*	♦	♦
Convulsions		*	♦	♦
Headache/visual disturbances	♦	*		*
Tears/lacerations		*	♦	♦
Urine output decreased	♦	*		♦
Blood pressure decreased		*		♦

DANGER SIGNS: FIRST WEEK POST-PARTUM

Danger Signs	Home Delivery Individual	Home Delivery Household	Home Delivery Community Resource	Delivery at Institution
Fever/chills	♦	♦	*	♦
Foul smell	♦	*		♦
Change in D/C	♦	*	*	♦
Abdominal Tenderness	♦	*		♦

♦ Primary responsibility. * Supportive role.

Household includes members of the household that may assist or be present at delivery (e.g., mothers, sister, in-laws)

Community includes TBAs, village health workers

EXHIBIT 24

Current Best Practices
POST-PARTUM MATERNAL CARE

SERVICES: 24 HOURS POST-PARTUM

Services	Home Delivery Individual	Home Delivery Household	Home Delivery Community Resource Person	Delivery at Institution
Identify caregiver	♦	*	*	♦
Monitor danger signs	♦	*	♦	♦
Initiate BF	♦	*	*	♦
Teach BF practices		*	♦	♦
Provide FP			*	♦
Teach about hygiene/ cleaning	*	♦	*	♦

SERVICES: FIRST WEEK POST-PARTUM

Services	Home Delivery Individual	Home Delivery Household	Home Delivery Community Resource	Delivery at Institution
Health visit	*	*	♦	♦
Promote nutrition		*	♦	♦
Vitamin A provision	*	*	♦	♦
FP counseling		*	♦	♦

SERVICES: SIX WEEKS POST-PARTUM

Services	Home Delivery Individual	Home Delivery Household	Home Delivery Community Resource	Delivery at Institution
TT (if necessary)		*		♦
FP (POP IUD, Depo/VSC)		*	♦ *	♦
Health visit	*	*	♦	♦

♦ Primary responsibility. * Supportive role.

Household includes member of the household that may assist or be present at delivery (e.g., mothers, sister, in-laws)
Community includes TBAs, village health workers

EXHIBIT 25

Current Best Practices

NEWBORN CARE

Preventive Newborn Care (Good Maternal Health)

- ✔ Provision of TT and IFA
- ✔ Adequate nutrition
- ✔ Treatment of infections (STIs, malaria, hookworm)
- ✔ Clean delivery
- ✔ Appropriate management of complications

Essential Newborn Care (First 24 hours)

- ✔ Attention to breathing
- ✔ Warming
- ✔ Cord care
- ✔ Prophylactic eye care
- ✔ Immediate breastfeeding

Normal Newborn (Beneficial)

- ✔ Weighing and registration

Newborn Care (First 7 days)

- ✔ Warming
- ✔ Exclusive breastfeeding
- ✔ BCG, OPV, Hepatitis B
- ✔ Monitor danger signs listed below

DANGER SIGNS FOR NEWBORNS
SEEK IMMEDIATE ATTENTION

AT BIRTH

Not breathing
Skin color is yellow (jaundice)
Labored breathing (greater than 60 respirations)
Convulsions

FIRST 7 DAYS

Hypothermia/Fever/Chills
Pale blue skin color including palms and soles of feet
Unable to suck twice
Unable to or poor sucking
Not active
Rigidity
Diarrhea/constipation
Red swollen eyes with discharge
Redness around the cord

EXHIBIT 26

PREFERRED TREATMENT FOR NEWBORN INFECTIONS

1.	**Sepsis**	(IV until improves, then IM 10 days)
	Preferred Treatment:	Ampicillan
	Alternative Treatment:	Gentamycin
2.	**Meningitis**	(IV until improves, then IM 14 days)
	Preferred Treatment:	Ampicillan
	Alternative Treatment:	Gentamycin
3.	**Convulsions**	
	Preferred Treatment:	Phenobarbital (IV)
	Alternative Treatment:	Phenytoin (IV) or Paraldhyde (suppository)
4.	**Tetanus**	
	Preferred Treatments:	Antitoxin, Penicillin, Anticonvulsant

Source: Stolls, B. 1995.
IM: intramuscular, IV: intravenous

EXHIBIT 27

ESSENTIAL NEWBORN CARE AND DANGER SIGNS

Essential Care	Practices At Birth	Practices First 7 Days	Danger Signs	Treatment At Health Center
Clean Delivery	6 Cleans* before, during, and after birth Warm place of birth.	N/A	N/A	N/A
Clean Cord Care	Cut cord with clean blade, tie tight and leave open to air.	Keep clean, leave open to air. May clean with water but not necessary.	Yellow, foul smelling drainage. Redness extending to abdomen.	Give first dose antibiotic and refer.
Breathing	No crying, check breathing. Start resuscitation.	If no breathing, start resuscitation. Monitor LBW.	Difficulty breathing.	Resuscitation. Assess for respiratory infection.
Thermal Protection	Warm place of birth. Dry baby with warm clean cloth immediately. Give to mother for skin-to-skin warming.	Keep baby warm and dry. Wrap according to climate.	Cold to touch. Hot to touch. Poor sucking.	Determine cause (e.g., infection). Treat appropriately (e.g., re-warm, bathe, give antibiotic, and refer).
Immunizations	N/A	BCG, OPV, Hep B	N/A	N/A
Birth Asphyxia	Management of complications. Resuscitation if needed.	Keep warm, breastfed. Monitor sucking/feeding.	Convulsions. Weak/ lethargic.	Give first dose of antibiotic and refer. Resuscitation if needed.
Infection	6 Cleans*	Keep warm, clean, breastfeed. Cord stump and eye care.	Hypo/hyperthermia, lethargy, poor feeding, convulsions.	Identify source of infection, give first dose of antibiotics and/or refer.
Pneumonia	Warm place of birth. Dry baby with warm clean cloth immediately.	Keep baby warm, dry, breastfed. Monitor respiration.	Response Rate >60. Nasal flaring, chest in-drawing.	Treat according to protocol symptoms. Give first dose of antibiotics, and refer.
Neonatal Tetanus	6 Cleans*	Keep warm. Clean cord and eyes.	Convulsions. Rigidity.	
Eye Care	Clean eyes right after birth with clean cloth. Apply drops/ointment per protocol.	Keep eyes clean. Do not apply herbs or other medicines.	Swollen, sticky with discharge.	Clean eyes, give parental antibiotic and refer.

*"Six cleans" Clean surface, Clean string to tie the cord, Attendant with clean hands; Clean blade to cut the cord; Clean cloth to wrap the baby in, Clean cloth for the mother.

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