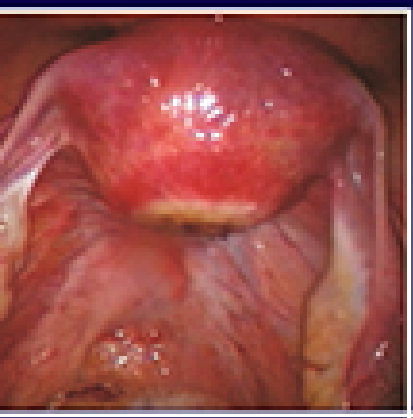
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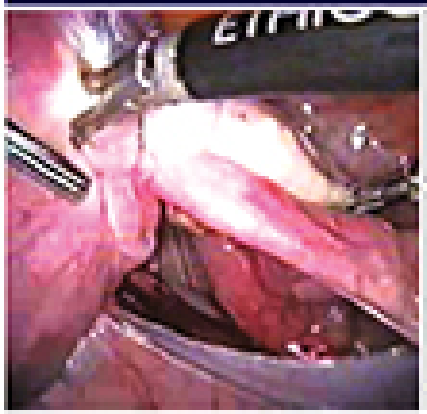
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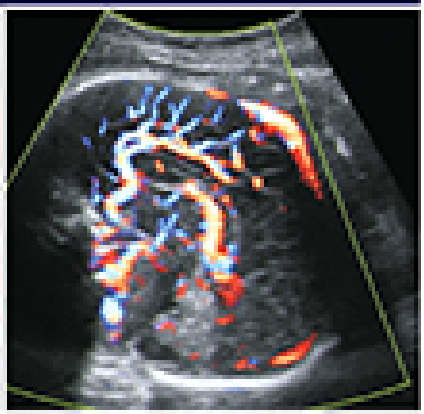


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Alokendu Chatterjee, Joydeb Mukherjee,
Partha Mukherjee, Nivedita Chattopadhyay
(Chapter updated by Mohita Pengoria)

From Safe Motherhood to Reproductive Child Health

JAYPEE BROTHERS

INTRODUCTION

Maternal mortality (MM) is a truly neglected tragedy. Ninety-nine percent of maternal deaths occur in the developing countries and among women in the most deprived sections of the population. MM remains one of the most daunting public health problems in India. In the global scenario, according to the World Health Organization (WHO) there are about 529,000 maternal deaths per year with a global ratio of 400 maternal deaths per 100,000 livebirths.[1]

Around 136,000 maternal deaths occur in India (WHO, 2004). National health survey (1998–1999) by International Institute for Population Sciences (IIPS) published from Mumbai in 2000, reported maternal mortality ratio (MMR) at 540, while the Register General Report in 1998 found MMR 470. As high as 80% of MM is preventable. The women in the developing countries have a lifetime risk of death following complications of pregnancy, about 250 times more than that of the developed countries. The lifetime risk of maternal death in the world on the whole is 1 in 74, which varies from country to country and region to region. In the least developed countries the chances are 1 in 17, in the developing countries the risk are 1 in 61 and in the developed countries the chances are 1 in 4,000. Again for every death, there are 10 more that are left with morbidities of various kinds that may have life-long crippling effects which the women endure in silence (Fig. 1).[2-4] It is very rightly stated that MM is only the tip of the iceberg of maternal morbidity and women's suffering.

DEFINITION AND CAUSES OF MATERNAL MORTALITY

The MMR means the number of death of women while being pregnant or during delivery or within 42 days of termination of pregnancy, irrespective of duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental causes, per 100,000 livebirth. Although this statistics is often called the MM rate, it is not really a rate because the numerator (maternal death) is not a part of the denominator (livebirth). The causes of maternal death are multiple; they are divided into direct and indirect causes (Tables 1 and 2). Other causes contributing to maternal death are listed in Table 3.

Direct obstetric causes (80%)[5] are those resulting from obstetric complications of the pregnant state (pregnancy,

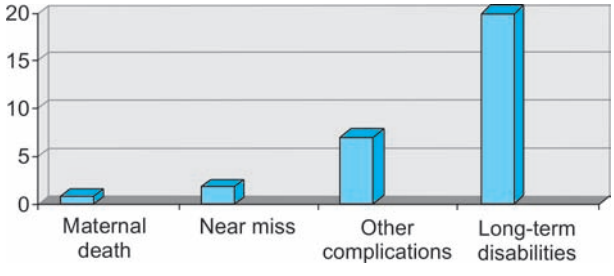


Fig. 1: Extent of maternal mortality, morbidity and disabilities[2-4]

Table 1: Direct causes of maternal mortality

- Sepsis including unsafe abortion
- Obstetric hemorrhage
- Eclampsia
- Accident of labor
- Others*

*Other direct causes include ectopic pregnancy, anesthesia related causes, embolism, etc.

Table 2: Indirect causes of maternal mortality

- Anemia
- Associated diseases
  - Cardiac
  - Renal
  - Hepatic
  - Metabolic
  - Infectious [including human immunodeficiency virus (HIV)]
- Malignancies
- Accident

Table 3: Contributory causes of maternal mortality

- Poor quality of health services including lack of proper infrastructure
- Inadequate obstetric care and essential supplies
- Poor maternal mortality audit
- Illiteracy, early marriage, poverty and malnutrition
- Unregulated fertility
- Ignorance—causes delay in making decisions during pregnancy
- Multiple demands on woman's own time

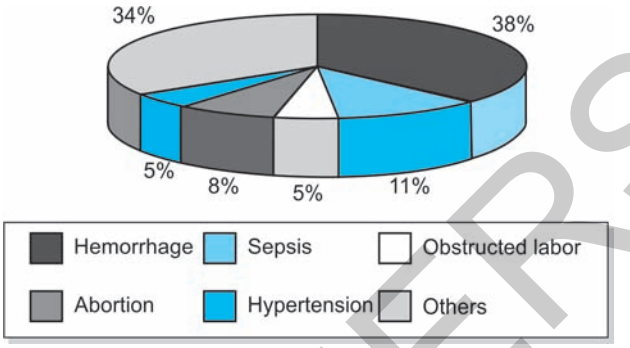


Fig. 2: Indian scenario of maternal deaths[5]

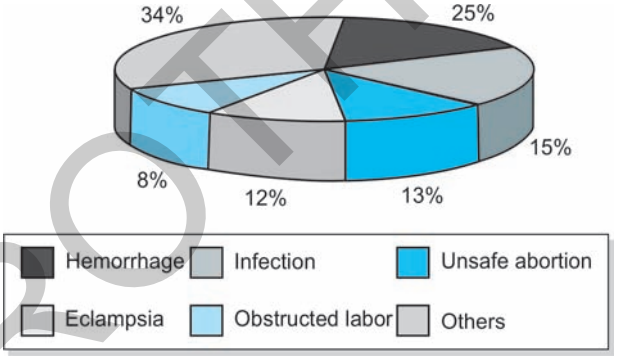


Fig. 3: Global scenario of maternal deaths[6]

labor and puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above (Table 1).

Indirect obstetric deaths (Table 2) are those resulting from a previously existing disease or a disease that developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by physiological effects of pregnancy. Investigators have found that 63–80% of direct maternal deaths and 88–98% of all maternal deaths could probably have been avoided with proper handling. Indian and global scenarios of maternal deaths are shown in Figures 2 and 3,[6] respectively.

SAFE MOTHERHOOD INITIATIVE

It is global effort to reduce MM and morbidity and to reduce maternal deaths by at least half by 2010; safe motherhood initiative (SMI) was conceived in 1987 at Nairobi. It has also aimed to enhance the quality and safety of girls' and women's lives through adoption of a combination of health and nonhealth strategies. Partners of SMI are governments, different nongovernment organizations (NGOs), World Bank, United Nations International Children's Emergency Fund (UNICEF), United Nations Fund for Population Activities (UNFPA), WHO, International Planned Parenthood Federation (IPPF), professional bodies and women's group. As a matter of fact anybody and everybody can be a partner of this initiative. It lays emphasis on the need for better and more widely available maternal health services, the extension of family planning, education and services and effective measures aimed at improving the status of women. It may take many forms: increasing awareness of the magnitude of the problem and the need for action; strengthening maternal health services; training of health workers and others; facilitating educational and economic opportunities for women and research particularly operational research.

STRATEGIES OF SAFE MOTHERHOOD

If we compare the maternal health scenario between the developed and the developing countries (Tables 4 and 5), it becomes evident at MMR in developed countries is very low compared to developing countries. The reasons for massive reduction of MM in developed countries and very high in developing countries has been described below.

- Keeping the above information in mind, a strategy (Fig. 4) was taken in India in 1992, called child survival and safe motherhood (CSSM).

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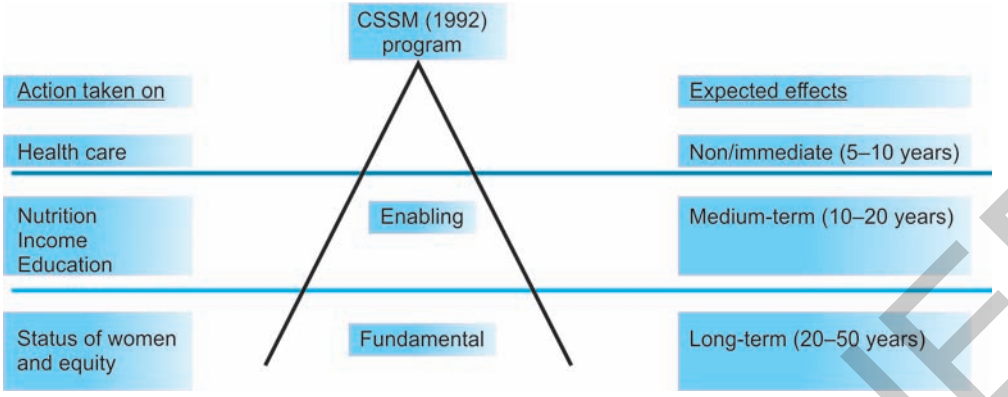


Fig. 4: The child survival and safe mother program
Abbreviation: CSSM, child survival and safe motherhood

Table 4: Maternal death scenario in developed countries (low MMR)

• Better status of women	98% prenatal care
• Better nutrition	95% institutional delivery
• Reduced fertility	99% skilled attendance at delivery
• Improved education	Good essential supplies
• No gender bias	Easy access to maternity service
• Standard health care	Improved maternal mortality audit

Table 5: Maternal death scenario in developing countries (high MMR)

• Poor status of women	59% prenatal care
• High gender bias	37% institutional delivery
• Illiteracy, ignorance	55% skilled attendance at delivery
• Early marriage and poverty	Poor health care
• Unregulated fertility	Poor access to maternity service
• Unsafe abortion	Erratic essential supplies
• Malnutrition, infection	Poor maternal mortality audit

- The tip of the pyramid shows health care programs of women for immediate results. Medium- and long-term goals are also defined.

HEALTH CARE INTERVENTIONS

The medical profession is responsible for delivering the obstetric health to all pregnant women. Obstetric health care means three "Es".

1. Essential obstetric care for all.
2. Early detection of complications.
3. Emergency obstetric care (EOC).

Protocol for Essential Obstetric Care (Fig. 5)

It includes focused antenatal care with booking between 12 weeks and 16 weeks with at least five visits. Routine blood pressure and weight are recorded, along with obstetrical examination. Mandatory investigations like hemoglobin (Hb) percent, blood grouping and Rhesus (Rh) typing, urine sugar and protein are to be done. Two hours are postprandial blood sugar may be performed. Each woman is prescribed iron, folic acid and deworming agent after 16th weeks. Immunization against tetanus and proper care at birth must be taken. "5 clean" must be followed during birth care, clean hand, clean surface, clean razor blade, clean cord tie and clean cord stump. These services can be provided by auxiliary nurse midwife (ANM) or medical officer (MO) at health center and their local doctor or by trained birth attendant, preferably at the women's locality. All health care providers must know when to refer the women to the nearest referral unit where EOC is available—this is the most important issue in the management of any obstetric complications, anywhere.

Early Detection of Complications

It is wise to remember that every pregnant woman is at risk of developing complications any time during pregnancy, labor and puerperium, and most complications cannot be predicted, also many complications cannot be prevented. Quality antenatal care can detect some complications early. It is always the first contact health providers who will detect the complications. In rural area, they are trained attendants/nurse midwives, family members and local practitioner. This group must be updated with the knowledge of signs of complications, e.g. bleeding anytime during pregnancy, convulsion, high fever, persistent headache and/or blurring of vision, excessive swelling of the body, less amount of daily urine output, prolonged labor pain and excessive bleeding after delivery, etc. and such cases should be referred to the nearest first referral unit (FRU).

Emergency Obstetric Care

The focus of safe motherhood programs in most developing countries has been on delivery of maternal services. The goal of reducing MM cannot be achieved, if prompt adequate care

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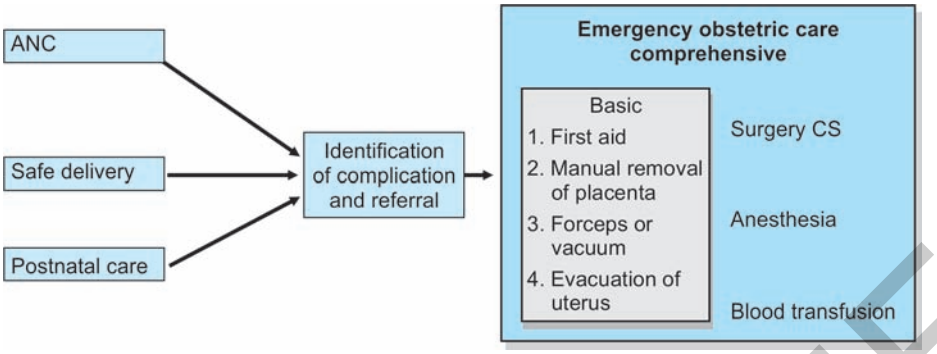


Fig. 5: Essential obstetric care
Abbreviations: ANC, antenatal care; CS, cesarean section

Table 6: Time interval between onset of complications and death

Condition	*Interval*
Postpartum hemorrhage	2 hours
Antepartum hemorrhage	12 hours
Rupture uterus	1 day
Eclampsia	2 days
Obstructed labor	3 days
Sepsis	6 days

is not available for obstetric complications. The challenge now is to shift the focus on EOC in addition to ongoing health care program. EOC includes specific interventions to manage specific emergency complications, which can be fatal within hours. It is agreed that 15% of all pregnant women will develop serious complications. Estimated average intervals from onset of complications to death are given in Table 6.[7]

- No women should ideally deliver in a place which is more than 2 hours away from a referral unit. Apart from hemorrhage, there is usually enough time for a woman to be saved, supposing four frequent causes of delay are limited:
  - Delay in recognizing the problem
  - Delay in seeking care
  - Delay in reaching care
  - Delay in receiving care.

Emergency obstetric care will be of three types:

1. Obstetric first aid
2. Basic EOC
3. Comprehensive EOC.

Functions to define obstetric first aid:

- Oral misoprostol
- Parenteral oxytocics
- Parenteral antibiotics
- Parenteral anticonvulsants.

Functions to define basic emergency obstetric care (include in addition to obstetric first aid):

- Manual removal of placenta
- Forceps or vacuum extraction
- Evacuation of uterus in incomplete abortion
- Intravenous (IV) fluid administration. This can be done in community health centers.

Comprehensive Emergency Obstetric Care

It includes, in addition to the above, facilities for surgery, anesthesia and blood transfusion. The first referral hospital forms vital link between rural community and the centralized district hospital. MM can be reduced more by treating the complicated cases earlier and nearer home at first referral hospital either by specialists or by the physicians with 3–5 years experience who possess basic skills in obstetrics and surgery.

First referral hospital or first referral unit: It may be an upgraded health center, community health center or may be a district hospital. Staffs here are trained to perform essential obstetric functions.[8] These are follows:

- *Surgical function:* Cesarean section, laparotomy for rupture uterus and tubal pregnancy, dilatation and evacuation, amniotomy, oxytocin infusion for augmentation of labor, repair of vaginal or cervical tears.
- *Anesthetic functions:* General/regional
- *Medical functions:* Treatment of shock, sepsis, hypertension, eclampsia and anemia.
- Blood transfusion
- *Manual or assessment functions:* Manual removal of placenta, vacuum extraction, forceps, partography.
- *Family planning:* Tubectomy, vasectomy, intrauterine device (IUD) insertion, norplant insertion, etc.
- Management of complicated pregnancy/labor referred from other levels.
- *Neonatal care:* Resuscitation, thermal control and feeding.

Doctors, policy makers and health planners need to recognize that the objective of SMI to reduce MMR cannot be achieved by the existing services alone the provision of EOC at all level will be essential to bring about a sizeable decline in MM.

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REPRODUCTIVE AND CHILD HEALTH PROGRAM

Phase I

The concept of reproductive health (RH), first introduced by Prof Fathalla, received a global acknowledgment during the International Conference on Population and Development (ICPD) (Cairo, 1994). ICPD defines RH as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity in all matters relating to the reproductive system, its function and process with a lifetime perspective". The main issues of reproductive and child health (RCH) program are the integration of all interventions relating to improve facilities of obstetric care, medical termination of pregnancy (MTP), IUD insertion in the public health centers (PHCs), specialist centers for sexually transmitted disease (STD) and reproductive tract infection (RTI) in all district hospitals and number of subdivisional hospitals, setting up of FRU at subdistrict level providing comprehensive EOC, integration of all interventions of fertility regulation, maternal and child health with RH for both men and women. RCH phase I program had incorporated safe motherhood components along with child survivor components including STD and RTI. The RCH program was launched on 15th October, 1997. The RCH program integrated all the services of CSSM and the major interventions like essential obstetric care, 24 hour delivery services at PHCs/community health centers (CHCs), EOC, MTP, prevention of RTI and STD.

Phase II

This phase II began from 1st April 2005 with a focus to reduce maternal and child morbidity and mortality along with an emphasis on rural health center. The major strategies under the RCH phase II are:

- Essential obstetric care
  - Institutional delivery
  - Skilled attendance at delivery
- Emergency obstetric operational FRU
  - Operationalizing PHCs and CHCs for 24 hours delivery services
- Strengthening of the referral system.

Recent initiatives have been taken to provide adequate training of the MBBS doctors in life-saving skills for EOC. This provision of adequate and EOC has been recognized as the most important intervention for saving lives of pregnant women with complications.

ROAD AHEAD OF SAFE MOTHERHOOD

Comparison of Indian and International initiative to reduce MM is shown in Table 7.

Table 7: Initiative to reduce maternal mortality

International	*Indian response*
SMI Nairobi 1987	CSSM 1992
Target to reduce MMR	Target to reduce MMR from
Half by 2000	400 to 200
ICPD Cairo 1994	RCH 1996
Defined "RH"	RCH-I 1997
MPS 2000	RCH-II 2005-2009
MDG 2000 (Goal 5)	RCH-II Target to reduce
Target to reduce MMR by 3/4th by 2015	MMR to 150/100,000

Abbreviations: SMI, safe motherhood initiative; MMR, maternal mortality ratio; CSSM, child survival and safe motherhood; ICPD, international conference on population and development; RH, reproductive health; MPS, making pregnancy safer; MDG, millennium development goals; RCH, reproductive and child health program

Making Pregnancy Safer

Making pregnancy safer (MPS) is a health sector strategy launched by WHO (2000)[9] for reducing maternal and perinatal mortality and morbidity.

The MPS strategy builds upon the lessons of SMI, existing national efforts and the consensus reached at the ICPD (Cairo, 1994), world conference on women (Beijing, 1995) and the joint WHO/UNFPA/UNICEF/WORLD Bank Statement (1999).

The universally agreed goals in maternal health include:

- Eighty percent childbirths be assisted by skilled attendants by 2005.
- In areas with very high MMR, at least 40% of births be assisted by skilled attendants by 2005, 50% by 2010 and 60% by 2015.
- Reducing pregnancy related mortality by 75% by 2015.
- Reducing infant mortality rate (IMR) below 35 per 1,000 livebirths by 2015.

Three Making Pregnancy Safer Messages

1. Every pregnancy ought to be wanted.
2. All pregnant woman and their infants should have access to skilled care.
3. Every woman should be able to reach a functioning health facility in good time to obtain appropriate care when complications arise during pregnancy, delivery or the puerperium period.

Making pregnancy safer call for following essential services which could prevent up to 80% of maternal and newborn deaths.

- Family planning information and services
- Postabortion care
- Basic antenatal and postpartum care
- Skilled attendance during pregnancy, delivery and postpartum period
- Referral centers for complications.

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Millennium Development Goals

This is described elsewhere.

The Partnership for Maternal, Newborn and Child Health

The partnership is a global health partnership launched in September 2005 and joins the maternal, newborn and child health (MNCH) communities into an alliance of some 130 members to ensure that all women, infants and children not only remain healthy, but also thrive. Ottawa, 21st June 2007—a meeting of Canadian and international health professionals was held to discuss why a half-million mothers are still dying each year. "Certainly, progress has been made in many areas," said Dr Dorothy Shaw, President of the International Federation of Obstetrics and Gynecology. "But it is a humbling experience that on the 20th anniversary of these goals, we still have a half-million women dying every year."

Geneva, 15th May 2007—The 60th World Health Assembly of the WHO gave prominence to the issue of MNCH.

Dar es Salaam, 17th April 2007—Prime Minister of Tanzania called on regional leaders to increase health spending to 15% of national budgets and to strive for achieving health millennium development goals (MDGs).

CONCLUSION

The challenge of reducing maternal morbidity and mortality is substantial and there are no simple solutions. The main priority should be for women to have the choice to deliver in any health center or hospital. Ensuring appropriate provision of EOC is an essential feature of all intrapartum care strategies, but timely access is crucial. Alternative approach to increase effective intrapartum care strategies is the availability of skilled birth attendants at home. During the last 20 years of International and National Advocacy for Safe Motherhood, an estimated 10 million women have died of maternal causes though 88–98% of maternal deaths are preventable. The International Federation of Gynecology and Obstetrics (FIGO) world report 2006 is dedicated to women of all ages and their children, who have lost their lives because their rights were not translated into meaningful action. FIGO, through collaboration with others, is committed to actions that will result in the respect of sexual and reproductive rights and access to health for women throughout the world.

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