

Lessons on Safe motherhood

C.L. Abou-Zahr

An outline is given of progress made in understanding the causes of maternal mortality since the Safe Motherhood Initiative was launched a decade ago. It remains vital to analyze why women are dying from pregnancy-related conditions and to identify the weak links in the chain of care.

Until the first global estimates of maternal mortality were made by WHO in 1987 the world was largely ignorant of the risks associated with pregnancy and childbirth in developing countries. It was shown that half a million women died each year following pregnancy-related complications, and this led to a multi-agency effort, the Safe Motherhood Initiative, whose purpose was to devise strategies for tackling problem in diverse settings.

WHO, one of the co-sponsors of the Initiative, has continued monitoring the situation as well as gathering information on the effectiveness of the measures taken. Much has been learnt but globally there is little evidence of progress in this field.

Recent estimates by WHO and UNICEF have shown that the dimensions of the problem of maternal mortality are greater than was originally thought. WHO's monitoring of the utilization of maternal health care services shows that coverage remains inadequate in most developing countries. There is no evidence of reductions in maternal mortality and little indication that the interventions needed to reduce it are reaching more women today than was the case ten years ago.

Search for Solutions

Some aspects of the Safe Motherhood Initiative give grounds for cautious optimism. Of particular interest is the recently achieved consensus about what works to reduce

maternal mortality and how proven interventions can be implemented in settings where resources are extremely limited.

For many years, health specialists and planners at the local, national and international levels argued about the merits and demerits of interventions specifically aimed at achieving safe motherhood: prenatal care, training traditional birth attendants, the risk approach as a strategy for reducing maternal mortality, the pros and cons of hospital and home deliveries and the uses of particular technologies.

Everyone was seeking a single vital intervention that would make pregnancy childbirth safer. The search was inspired by the successes that have been achieved in other areas of international public health such as immunization or control of diarrhoeal diseases. These identified a clear strategy involving simplification of the technology and attention to the logistics of delivering it even in the most deprived and remote settings. Similar efforts have been directed - and success achieved - in making contraceptive technologies more accessible to those who need them. What these successes have in common is a relatively simple technology that can be delivered at any level from the community to the hospital, and a clear managerial framework for getting it there. It is now clear that no such solution is available in the area of safe motherhood.

After 20 years of efforts to train traditional birth attendants to care for women during pregnancy and childbirth, there is no evidence that this in itself makes any difference to maternal mortality. Without a functioning referral system and backup from professionals, such training is ineffective in this respect (1). On the other hand, training traditional birth attendants to recognize problems and guide women through the formal health sector when necessary has been effective in a range of settings.

In Fortaleza, Brazil, traditional birth attendants bridge the gap between the formal and informal sectors, and 5 maternal mortality has been reduced to low levels even though most women continue to deliver at home (2). In Guatemala, following a project in which closer working with traditional birth attendants was encouraged, referrals made by them increased significantly, and among women with complications an increased number used the formal health services (3).

The Key in the chain and the critical element in reducing maternal mortality is the person with midwifery skill who can handle normal deliveries, recognize complications, and either manage them or refer them to a higher level of care.

It has also been necessary to reassess the value of antenatal care in reducing maternal mortality. The expectation that antenatal care or some element of it could help to avert maternal deaths has not been fulfilled. Only a few commonly used antenatal interventions improve maternal health, and fewer still have an impact on maternal mortality. WHO was one of the first bodies to question the assumption that antenatal care alone could reduce maternal mortality (4).

For many years WHO was an active proponent of the risk approach, aimed at channeling limited resources more effectively towards the women most likely to have serious complications. This, however, did not fulfil expectations as a public health tool. Risk screening, usually carried out during antenatal care, involves using a list of risk factors and a scoring system to separate women into risk categories, such as "high risk" and "low risk".

Unfortunately, risk assessment does not accurately identify women who will have negative outcomes and thus fails to result in effective or efficient service provision (5). For example, WHO undertook a large-scale analysis of research studies on maternal anthropometry and found that whereas poor maternal nutritional status was associated with certain adverse pregnancy outcomes the predictive value for individual women of indicators of nutritional status, namely height, weight, and mid-upper arm circumference, was very poor (6). Furthermore, training health care workers to carry out complex risk assessments can divert resources from other, more valuable, interventions and clinical duties.

Chain of Care

The aim has been to prevent maternal deaths by predicting which women are most likely to die and ensuring that they receive extra care, but this approach is of limited value for reducing pregnancy related deaths and disabilities. Preventive interventions are effective in terms of preventing pregnancy rather than preventing complications. Increased use of contraception clearly reduces numbers of maternal deaths but does not diminish the risk of death once a woman is pregnant. Family planning information and services can help reduce the numbers of unwanted pregnancies and their consequences, including unsafe abortion. The provision of safe termination services in settings where abortion is legal reduces maternal deaths caused by complications of abortion. The prevention of other causes of 'maternal death, however, such as hemorrhage, sepsis, eclampsia, obstructed labor, 'embolisms and ectopic pregnancy, requires different kinds of intervention. Once a woman is pregnant she needs attention throughout pregnancy

and childbirth, including basic maternal care and obstetric care for the management of complications.

Although obstetric care is the key to reducing maternal mortality, this does not imply that pregnancy and childbirth should be perceived as intrinsically pathological processes, requiring systematic, high-technology interventions in costly hospital settings. Nor does it necessarily mean that other aspects of maternal care, such as prenatal care, should be abandoned. It does imply, however, that simplistic, reductionist approaches to preventing maternal mortality cannot work. An approach is needed which starts in individual homes and families and links them to a health care system providing effective interventions and an abundance of tender loving care. A break at any point in this chain can be expected to prevent women from receiving the care they need. For women suffering complications of pregnancy and childbirth such a break may mean the difference between life and death.

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The key link in the chain and the critical element in reducing maternal mortality is the person with midwifery skills who can handle normal deliveries, recognize complications, and either manage them or refer them to a higher level of care. This person should be professionally trained, properly supervised, and provided with adequate equipment and supplies. The chain of care has to be created by the health sector with the collaboration of other sectors and the involvement of women and their families. In a given setting, parts of the chain may be functioning effectively while others may be inadequate; some desirable elements may not even exist. An understanding of precisely where to concentrate effort in each setting is the key to achieving safe motherhood.

There are still vast discrepancies in coverage between developing and industrialized countries, between rural and urban areas, between poor and rich women, and between the educated and uneducated. In the more developed regions of the world almost all pregnant women benefit from skilled assistance during childbirth, whereas in the less developed regions only slightly more than half of pregnant women give birth with a skilled person in attendance, 35% have no contact with a health care system during pregnancy, and fewer than one in three have any postpartum care - coverage of postpartum care is only 5% in some countries (7) (Table 1).

Table 1: Coverage of Maternity Care by Region, in or around 1996.

	% of pregnant women with at least one prenatal care visit	% of women delivering with a Skilled attendant
World	68	57
Africa	63	42
Asia*	65	53
Europe	97	98
Latin America and Caribbean	73	75
North America	95	99
Oceania*	75	52

In almost all settings, more pregnant women receive some prenatal care than receive skilled care during childbirth. Women who deliver with a skilled attendant usually also receive some prenatal care, but the reverse does not hold. Far more women have prenatal care only than have skilled care both during pregnancy and childbirth. More women receive skilled care during childbirth than receive postpartum care. Yet most maternal deaths occur during delivery or in the immediate postpartum period (8). Almost half of postpartum deaths occur within a day of delivery, and some 70% occur within a week, almost all being directly related to events that take place during the intrapartum period. Clearly, there is a mismatch between the need for maternal health care and the patterns of utilization.; Women are not getting the right care when they need it.

Balance of Interventions

Successful country programs for reducing maternal deaths vary considerably. The person caring for a woman during labor and childbirth has greater influence than the place of delivery, whether at home or in a health center or hospital (9). Some examples of diverse approaches in successful country programs are given below:

In north-east Brazil and rural China most deliveries take place at home with the assistance of non-professional, minimally trained birth attendants;

In Malaysia and the Netherlands, home deliveries with professionally trained midwives are the norm;

In Grenada, Sri Lanka and the United Kingdom most deliveries take place in health facilities offering a basic package, of maternal care, available for 24 hours a day, with management of complications except those requiring caesarian section;

In Mexico City and the USA all deliveries take place in hospitals with the assistance of specialist health care professionals.

All these approaches seek to work within attainable resources to ensure that women have access to and use a level of the health care system, which is acceptable to them, and can link them to a higher level if complications arise.

Hospital deliveries are increasing in many countries. For example, during the 1950s most births in Sri Lanka took place at home with the assistance of untrained, birth attendants. By the end of the 1980s, over 85% of all births were attended by trained people and 76% took place in institutional settings. Maternal mortality fell from over 1500 per 1,00,000 live births in 1940-1945 to 95 per 1,00,000 in 1980, reflecting the introduction of a system of health centers, the expansion of midwifery skills, and the spread of family planning (10).

Avoiding Overmedicalization

Institutional delivery carries some risks, including that of increased rates of caesarian section and accompanying maternal complications. In developed countries these rates rose steadily throughout the 1960s and 1970s (Table 2). Particularly high rates have been reported from parts of Latin America (11) (Table 3).

Table 2: Caesarian Delivery Rates in England and Wales, the Netherlands, and the USA, 1968-1981

	England Wales %	and Netherlands %	USA %
1968	4.0	1.8	5.3
1969	4.3	2.0	-
1970	4.3	2.0	5.5
1971	4.6	2.1	5.8
1972	4.9	2.3	7.0
1973	5.0	2.5	8.0
1974	5.3	2.7	9.2
1975	5.7	2.8	10.4
1976	6.3	2.9	12.1
1977	7.1	3.5	13.7
1978	7.3	3.9	15.2
1979	8.2	3.9	16.5
1980	8.8	4.3	16.5
1981	9.1	4.7	17.9

Table 3: Caesarian Delivery Rates in Brazil, Colombia, Dominican Republic and Ecuador.

Country Deliveries	Years	% Caesarian
Brazil	1981-1986	32
Brazil	1991-1996	36
Colombia	1991-1995	17
Dominican Republic	1986-1991	22

Ecuador	1989-1994	17
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The data can be partly explained by differences in the obstetric characteristics of the populations served and in the amount and sophistication of the skills and equipment available. However, these factors cannot account for all the variations in rates of caesarian delivery, which are in part related to non-medical issues such as fear of malpractice litigation, convenience for clinicians, and financial incentives (12).

As rates of institutional delivery have risen, increasing concern has been expressed about the quality of care. Many maternal complications and deaths are the result of iatrogenic factors and are the responsibility of health care providers. Many such deaths are avoidable, and substandard care on the part of obstetric teams, involving incorrect diagnoses or inappropriate interventions, is the most important underlying cause of maternal mortality (13).

Rising rates of hospital delivery are often accompanied by a perception of pregnancy as a pathological condition requiring medical intervention. Health systems should strike a satisfactory balance between providing medical care and regarding pregnancy and childbirth as normal processes, even though they carry certain risks. WHO advises that, in a normal birth, the attitude of the health professional should be one of expectant watch-fulness with interventions limited to those needed to ensure a healthy outcome. Some routine interventions at birth may be unhelpful, untimely or unnecessary. Thus it was found that procedures such as the administration of enemas, shaving pubic hair, and withholding food and drink were unnecessary and possibly harmful. Rigid adherence to certain birth positions was condemned, and no evidence was found that routine episiotomy or electronic fetal monitoring was beneficial (14).

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Matching Technology with Setting

Careful scrutiny of commonly used interventions represents an important step forward in knowledge about how best to care for neonates and pregnant women. In the past, activities were often carried out without systematic evaluation of their effectiveness. Interventions that seemed to be effective in developed countries were applied in

settings that were less well resourced, without proper analysis of the implications of doing so. This was particularly evident in the introduction of new technologies. Although many different technologies have contributed enormously, to reducing maternal and perinatal mortality and morbidity, insufficient attention has been paid to the economic, human and infrastructural consequences, particularly in new settings (12).

WHO's Maternal and Newborn Health/Safe Motherhood program has done much to identify, test and disseminate appropriate technologies for maternal and newborn health care. A technology in this context can be defined as an association of methods, procedures, techniques and equipment which, together With the people using them, can contribute to solving a health problem. To be appropriate, a technology has to be scientifically sound, adapted to local needs, acceptable to those who use it or for whom it is used, and capable of being maintained and utilized with resources that the community can afford. The pantograph, for example, a simple pictorial record, helps providers to decide when labor is progressing too slowly and intervention is necessary (15). Another example is the home-based maternal record, a printed card allowing women to keep track of their health during and between pregnancies. Often designed for non-literate people, it contains a complete reproductive health history which women can retain when they go to live in a new area. It provides a link between women and providers promotes self-care and can serve as an educational tool. One of its most empowering features is the inclusion of signs and symptoms of pregnancy-related complications, which helps families to make decisions when problems arise.

Basing Interventions on Evidence

Perhaps the most important conclusion to be drawn from experience during the first ten years of the Safe Motherhood Initiative is that insufficient attention has been paid to defining precisely which interventions work and which do not. Many maternal health care interventions were first used in developed countries and then introduced in developing country settings without adequate attention to their effectiveness or feasibility where resources were very limited.

Today, attention is increasingly focused on "evidence-based" approaches. WHO's Mother-Baby Package, a technical guide to implementing safe motherhood interventions in countries, features only those known to be effective in improving health outcomes for mothers and infants (16). WHO's Maternal and Newborn Health/Safe Motherhood Program is building on this basis to develop essential practice guides for the care of pregnant women. It is intended that these guides will describe the

elements of care that must be in place before others are introduced into a system. For example, antenatal care should include tetanus toxoid immunization as well as screening and treatment for syphilis.

Unless these interventions have been adopted it is not possible to state that women are receiving adequate antenatal care.

Systematic reviews of reliable research on the effectiveness of care routines during pregnancy and childbirth are being prepared and disseminated by an international network of collaborating obstetricians, midwives and primary health care professionals (17). Research is in progress on the effectiveness of specific elements of maternal health care, including a trial on alternative regimens of antenatal care. A collaborative effort has shown conclusively that magnesium sulfate is the drug of choice in the management of eclampsia (18).

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Consensus on the interventions needed to reduce pregnancy-related mortality has been accompanied by a better understanding of the mechanisms needed to monitor progress. During the early years of the Safe Motherhood Initiative, much effort went into finding innovative ways of assessing the dimensions of the problem by measuring levels of maternal mortality. In practice this is a complex and difficult undertaking and none of the methodologies available permits regular monitoring of progress (19). Attention is turning to monitoring process indicators that reflect access to maternal health care for pregnant women (20).

Furthermore, there is now agreement that the absolute value of the maternal mortality ratio is not as important for program or planning purposes as an analysis of why women are dying from pregnancy-related conditions. Is it because they cannot reach appropriate services? Is it because the services do not exist or are inaccessible for reasons of distance, cost, social or cultural barriers, and so on? or is the care received in health services inadequate, inappropriate or substandard? These questions are more important than the precise level of maternal mortality. The Safe Motherhood Initiative has to answer them and find out where and why the chain of care gets broken.

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