



## ACCELERATING REDUCTIONS IN MATERNAL AND NEWBORN MORTALITY: CHALLENGES AND OPPORTUNITIES<sup>1</sup>

*Women hold up half the sky...*  
African proverb

**A**cross most of the industrialized world, a woman's pregnancy typically is a period of great joy and elation, and usually culminates in the celebration of a cherished new life. Yet for hundreds of millions of women, particularly those in developing countries, pregnancy presents great perils and risks, often evoking substantial fear and even despair. Millions of those pregnancies and childbirths each year result in serious health problems and even life-long disabilities for the mothers-to-be. And for far too many other women, pregnancy leads not only to their own death, but also to the death of their newborn and, at times, even their older children.

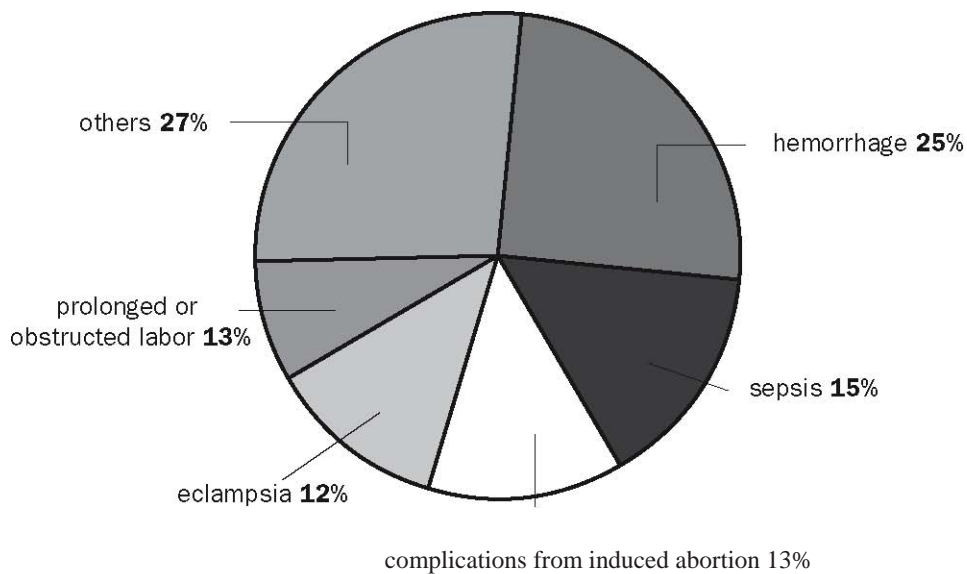
### ***Too many women are injured and die unnecessarily from pregnancy and childbirth...***

Worldwide an estimated 529,000 women die from complications of pregnancy and childbirth each year.<sup>2</sup> That translates into one a minute, 60 an hour, or some 1,450 women a day. And an estimated 20 million women suffer pregnancy-related illness after birth. In fact, many women who survive childbirth are seriously injured or disabled. Many face long-term disabilities such as uterine prolapse, incontinence, infertility, and obstetric fistula, which profoundly and negatively affect the quality of their own and their families' lives. Overall, at least 40 percent of women in developing countries experience complications, illnesses or permanent disability during pregnancy, childbirth or the six weeks after delivery, and 15 percent of women develop potentially life-threatening problems.<sup>3</sup> This enormous human toll of death and suffering is unacceptable and unnecessary.

### ***Key causes and risk factors are well known...***

Almost three-quarters of maternal deaths globally are due to five major complications of pregnancy and delivery—hemorrhage, infection/sepsis, complications from induced abortion, hypertensive disorders related to pregnancy, i.e. eclampsia, and prolonged or obstructed labor, as highlighted in Graph 1. Some 11 to 17 percent of these deaths occur during childbirth, and between 50 and 71 percent occur in the postpartum period. Of these latter deaths, almost half (45 percent) occur within the first 24 hours of delivery and more than two-thirds over the first week after delivery.<sup>4</sup> It is estimated that up to 74 percent of these deaths could be averted using a combination of household, community and health system interventions that can be cost-effectively delivered, even in extremely resource-scarce settings.<sup>5</sup>

Graph 1  
Causes of Maternal Deaths



Source: WHO, World Health Report 2005. Figure 4.1

***Women in developing countries, particularly the poorest women, bear the heaviest burden of illness and death...***

Women in developing countries are particularly vulnerable to poor pregnancy and childbirth outcomes. The pace of progress in reducing maternal mortality in the poorest countries continues to lag considerably behind others. Underlying these troubling maternal mortality figures are the substantial risks that women in the poorest countries face at the level of the individual, the household and community, and the health system itself.

*At the individual level*, those who are very young or very old at conception are at higher risk of pregnancy-related illness and death. Maternal outcomes also are strongly affected by a woman's overall health and nutritional status both prior to as well as during her pregnancy. A number of prevalent, pre-existing health conditions and diseases as well as those that may develop during pregnancy (albeit not directly related to the pregnancy per se) are aggravated by the physiological effects of pregnancy. Among the most common indirect causes of maternal illness and death in many settings are such endemic diseases as malaria, hookworm infestation, diabetes, hepatitis, HIV/AIDS, and cardio-vascular diseases<sup>6</sup> (with AIDS becoming a leading cause of indirect maternal death in South Africa). Malnutrition, especially anemia and stunting—the latter the result of poverty-related chronic malnutrition during her own childhood—increase maternal risk.

Parity, or number of previous pregnancies, and spacing of the time between the index pregnancy and the last birth, significantly impact maternal and newborn health outcomes. As Table 1 shows, halving the total number of pregnancies a woman has over her reproductive life diminishes her lifetime risk of dying from pregnancy-related causes by half, independent of the base maternal mortality ratio.

Table 1

Lifetime risk of maternal death at varying maternal mortality ratios (MMRs) and pregnancies per women		
	MMR=500	MMR=250
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: UNICEF, WHO and UNFPA (1997)

Many women in the developing world face numerous unplanned and unwanted pregnancies. Underlying continuing high fertility rates throughout many developing countries is inadequate access to desired reproductive health care, resulting in poorly spaced births. An estimated 123 million women, predominantly those who reside in developing countries, presently are estimated to have unmet needs for safe and effective reproductive health services.<sup>7</sup> Access to family planning information and services is essential to attainment of desired improvements in maternal health and reductions in maternal mortality. An estimated 100,000-150,000 maternal deaths could be averted annually if women had such services.<sup>8</sup>

Globally, some 2.2 million women living with HIV/AIDS give birth each year<sup>9</sup>. Women with HIV/AIDS are at higher risk of pregnancy complications. Notably, 5 to 10 percent of HIV-positive women succumb to HIV-related disease during pregnancy or the first six weeks after delivery.<sup>10</sup> This has led to close monitoring of HIV prevalence among pregnant women 15 to 24 years of age—one of the highest risk groups in the developing world – as a key measure of progress toward the Millennium Development Goals.

*At the household and community levels,* numerous socio-cultural and economic factors influence a woman’s reproductive life, including whether she can or will obtain timely, appropriate emergency obstetric care when needed. Among these are cultural norms within the community regarding age at marriage and childbearing; low levels of educational attainment and absence of opportunities for employment; household income, direct costs and opportunity costs of seeking health care including the time and distance required, given many other competing demands on her.<sup>11</sup> In addition, females and their families, especially those from the poorest subgroups of the population, may lack adequate knowledge and information about optimum care during pregnancy, including the importance of accessing and using skilled providers for delivery.

Maternal and child health status and survival are inextricably linked to the education of girls and women. A woman’s level of educational attainment strongly influences the total number of children she bears, and thus her risk of maternal mortality, is well documented internationally. Better-educated women overall have fewer children than those who are less educated. Among the key reasons for this fertility rate differential is that girls who remain in school marry later and hence have fewer years of childbearing. Those women with more education also tend to have better reproductive health knowledge and to be more empowered to make family size decisions. A woman’s educational level also strongly impacts not only her own overall health and nutritional status and her utilization of key health services, but also that of her children. The association between female education with key maternal and child health outcomes is shown in Table 2. Investing in girls’ education thus reaps high health payoffs as well as other economic and social benefits.

**Table 2**

Association between Female Education and Selected Indicators of Maternal and Child Health Status, Service Utilization and Outcomes							
Level of Female Educational Attainment	% ever married women whose height is below 145 cm, often sign of stunting	% ever married women who are underweight per their Body Mass Index	% ever married women with moderate to severe anemia	% women who had births during past 3 years with no prenatal check-up during pregnancy	% distribution of births during past 3 years by skilled attendants	Infant mortality rate per 1,000 live births	Child mortality among 1 to 4-yearolds per 1,000 live births
Illiterate	15.4	42.6	19.1	48.4	25.4	86.5	39.7
Literate, but < complete middle school	12.2	32.6	15.7	19.3	53.1	58.5	18.4
Completion of middle school	9.8	28	13.9	13.5	66.9	48.1	10.5
Completion of secondary school and above	7.7	17.8	10.6	5.8	83.4	32.8	4.4

Source: National Family Health Survey, International Institute for Population Studies, 1998-99

Underlying many maternal illnesses and deaths are stark, continuing economic, social and political inequities facing many women in the developing world in particular. Poverty and disempowerment are pervasive, with far too many women still having little if any social status or voice in key decisions directly affecting their own lives and those of their children. These factors often create a “social curtain” around these women which is difficult for health services to penetrate.<sup>12</sup> Too many girls and women continue to be denied the most fundamental of human rights. In numerous countries, for example, women cannot own major assets such as land nor, relatedly, access credit. They must secure permission from a male, be he a spouse, a brother, or a village chief or local community leader, to be able to access key social services, including education and health care. They are denied protection from violence and abuse, and are unable to participate in the political process. All these factors are crucial determinants of their own well-being and that of their children.

*Within health systems*, the demand for and utilization of maternal health services also depends on numerous factors, many beyond a woman’s direct control. Among these are: the physical accessibility of facilities to her home; direct and indirect costs of obtaining services including not only fees charged but also the convenience of operating hours and average waiting times; the extent to which staff are competent, providing quality care and demonstrating cultural sensitivity and responsiveness to her needs, especially important to women from marginalized, poor groups; and the availability of other key health care inputs needed including essential drugs and food supplements. A fully functioning referral system is an essential component of any strategy to reduce maternal mortality. Yet throughout much of the developing world, this system simply does not meet women’s, infants’ or children’s basic health care needs. In fact, in many countries, this system totally fails them, offering limited if any services.

These factors at the individual, family and household and health system levels are typically interdependent and interact, strongly influencing both access to and use of maternal health services, including emergency obstetric care. They underpin three common delays in obtaining emergency care when needed, and resultant poor maternal health outcomes—delays among women, their families and local health care workers in recognizing the need for higher levels of care and directly securing such care including stabilizing their condition when needed to facilitate referral; delays in reaching appropriate care when sought; and delays in delivering appropriate care at the facility.

***Maternal mortality is heavily concentrated in two Regions of the world....***

Pregnancy-related deaths and disabilities are one of the starkest and most poignant markers of development inequities. Maternal deaths are heavily concentrated in two Regions and a relatively small number of countries within them. Less than one percent of maternal deaths occur in the developed regions, and only four percent in the Latin America and Caribbean region.<sup>13</sup>

Africa and Asia account for 95 percent of maternal mortality annually, with the number of deaths distributed almost equally between them. The relative risk of dying over the course of their reproductive lifetime is the highest for women in Africa.<sup>14</sup> As indicated in Table 3, in the year 2000, an estimated one in 16 women in Sub-Saharan Africa bore such risk compared to one in 44 in Southern Asia. Moreover, risks in both these Regions sharply exceed those of women in developed regions, with only one in 3,800 of the latter at lifetime risk of a pregnancy- or childbirth-related death.<sup>15</sup>

Table 3

Maternal Mortality Ratio and Lifetime Risk of Maternal Death, 2000		
Region	Maternal deaths per 100,000 live births	Lifetime risk of maternal death <sup>16</sup> 1 in:
World	400	74
Developed regions	14	3,800
Commonwealth of Independent States	68	820
Developing regions	450	60
Northern Africa	130	210
Sub-Saharan Africa	920	16
Latin America and the Caribbean	190	160
Eastern Asia	55	840
Southern Asia	540	44
South-Eastern Asia	210	140
Western Asia	190	110
Oceania	240	83

Source: WHO/UNICEF Maternal Mortality in 2000. Estimates developed by WHO, UNICEF, UNFPA.

Eighteen countries have maternal mortality ratios of 1,000 or more per 100,000 live births (see Table 4). With the notable exception of Afghanistan, all are in Sub-Saharan Africa. Data indicate that women in Sierra Leone are at the highest overall risk, with two maternal deaths for every 100 live births. This overall pattern of mortality signals the opportunity to save hundreds of thousands of mother's and newborn lives each year if concerted efforts are launched and sustained in a relatively small number of countries within the two most affected Regions.

Table 4

Countries with 1,000 or more maternal deaths per 100,000 births	
Estimated Maternal Mortality Ratio, 2000	
Sierra Leone	2,000
Afghanistan	1,900
Malawi	1,800
Angola	1,700
Niger	1,600
United Republic of Tanzania	1,500
Rwanda	1,400
Mali	1,200
Central African Republic	1,100
Chad	1,100
Guinea-Bissau	1,100
Somalia	1,100
Zimbabwe	1,100
Burkina Faso	1,000
Burundi	1,000
Kenya	1,000
Mauritania	1,000
Mozambique	1,000

Source: WHO/UNICEF Maternal Mortality in 2000. Estimates developed by WHO, UNICEF, UNFPA.

### ***Inequities in access to key services impact health outcomes...***

Within countries, the poorest women are at the highest risk of maternal morbidity and mortality, reflecting in large part enormous disparities in access to timely, appropriate health care. Research in Matlab, a rural district of Bangladesh, for example, revealed very distinct patterns of utilization of facility-based emergency obstetric care in the late 1990s, by income group.<sup>17</sup> Whereas only 14 percent of poor mothers had skilled attendants at delivery, 46 percent or almost half the women in the highest income group did. Further, the richest women were 12 times more likely to have given birth in a private facility than the poorest ones. Disparities, though less pronounced, also existed in accessibility to prenatal and postnatal care by these two income groups. Other factors also influenced utilization. The higher the level of the mother's education, the more likely she was to have accessed maternal health services. Conversely, the greater the distance to the nearest health center, mother's age at delivery, and parity, the lower the service utilization rate. This study thus confirms findings of other research that mere provision of health services is necessary but insufficient in itself to redress large inequities in access.

***These women's infants and children also face high risks of illness, premature death and uncertain futures...***

Women's access to quality maternal health care and, relatedly, pregnancy outcomes strongly impact child survival. WHO estimates indicate that of the 136 million babies born globally each year, some 10.6 million die before their fifth birthday.<sup>18</sup> More than half of all deaths among young children occur in six countries – China, the Democratic Republic of Congo, Ethiopia, India, Nigeria and Pakistan.<sup>19</sup> Notably, almost 8 million of all deaths of children under five years of age occur before an infant's first birthday. That represents some 15 infant deaths a minute, 900 an hour, and 22,000 a day.

As WHO data reveal, every year more than 4 million infants die during the first four weeks, i.e. 28 days, of life—the neonatal period. That represents 450 newborn deaths every hour, and 10,800 every day. The mortality rate in the neonatal period thus is close to 30 times higher than in the post-neonatal period. Additionally, as mortality rates among older children are declining, the proportion of deaths occurring in the neonatal period is increasing. The achievement of the fourth Millennium Development Goal - that to reduce mortality among children under five years of age by two-thirds between 1990 and 2015 – will require even greater efforts than in the past, especially targeting the critical initial period of life. Many countries presently are at high risk of not meeting this goal.

Notably, the vast majority of those early deaths are preventable. Pre-term labor, severe infections and asphyxia account for over three quarters of neonatal deaths. Low birth weight is a major indirect cause of such deaths affecting an estimated 18 million newborns each year.<sup>20</sup> Globally some 75 percent of all neonatal deaths, i.e. 3 million, occur within the first week of life, with the highest risk being on the first day of life. Another 3.3 million stillbirths occur each year during the last three months of pregnancy. Most of these neonatal deaths and stillbirths outcomes are influenced by health throughout a woman's life, commencing with her health and nutritional status as a girl-child, through adolescence and pregnancy. They are closely linked to the mother's health and the care she received prior to, during, and immediately after delivery. The main causes and risk factors thus differ significantly from those underlying deaths among older infants and young children.

Similar to the geographic distribution of maternal deaths, 99 percent of stillbirths and neonatal deaths occur in the developing world. A newborn in the developing countries faces a six times greater risk of dying within his/her first four weeks of life than one in the developed countries. This risk increases to 8:1 in the least developed nations, with the highest likelihood of neonatal death being for those born in Eastern, Western and Central Africa (averaging 42 to 49 neonatal deaths per 1,000 live births), and South Central Asia (45 per 1,000 live births)<sup>21</sup>. In sheer numbers, however, 40 percent of global neonatal deaths each year occur in the South Central Asia sub-region where most of the world's births occur. With a few notable country exceptions, little progress has been made over the past 10 to 15 years in reducing neonatal deaths.<sup>22</sup> Post-conflict countries such as Liberia and Sierra Leone have especially high neonatal mortality rates.<sup>23</sup>

As WHO in its Neonatal and Perinatal Mortality Report underscores, while the high levels of stillbirths and neonatal deaths is unacceptable, redressing them presents a formidable challenge. Because such deaths are so common in many of the poorest developing countries, they are not always perceived as problems. Indeed, in some societies, births are not even registered until an infant survives this critical early period. Hence, the actual extent of stillbirths and neonatal deaths may be substantially underestimated. Prevention of neonatal deaths has not traditionally been a major focus of safe motherhood or child survival programs. Moreover, many countries face a serious shortage of health staff

adequately trained to identify and respond to newborn infant needs, although cost-effective interventions exist.

Poverty is among the key underlying causes of these deaths, leading to poor maternal health and nutritional status, as reflected in relatively low height and weight of women prior to pregnancy and often low caloric intake and weight gain during pregnancy. The high prevalence of infections, including sexually transmitted diseases is a major contributing factor. These risks are exacerbated by the lack of access to appropriate care during pregnancy, when facing pregnancy or delivery-related complications, including premature births, and lack of timely and essential postpartum care, particularly that needed by both women and newborns in the first crucial hours and weeks after birth.

Indeed, neonatal mortality is considered one of the most sensitive barometers of the mother's health and nutritional status and the quality of both maternal and newborn health care she receives. Hence, ensuring safer pregnancies and improved newborn care must form an integral part of any strategy to reduce stillbirths and neonatal mortality in the developing world. With only 60 percent of births in developing countries attended by skilled health personnel<sup>24</sup>, increasing community knowledge of appropriate obstetric and neonatal care, and ensuring its availability, is crucial. Application of relatively simple techniques could lead to significant reductions in illness and deaths among newborns. An estimated three-quarters of neonatal deaths could be prevented if women were adequately nourished and received quality care during pregnancy, childbirth and the postpartum period.<sup>25</sup>

The high prevalence of HIV/AIDS among women presents special risks to their infants. UNAIDS estimated that in 2002 some 19.2 million women and 3.2 million children were living with AIDS. Females in Sub-Saharan Africa comprise 60 percent of HIV-infected adults. Notably, over 90 percent of HIV infections among children occur through mother-to-child transmission during pregnancy, at delivery or through breastfeeding. In 2002 alone, an estimated 800,000 children were thus infected. Existing low-cost drugs like nevirapine can prevent such transmission but, like other health services and pharmaceuticals, are not widely available, particularly to those at highest risk in the poorest countries.

### ***A child is at especially high risk when a mother dies...***

The linkages between maternal and infant and child mortality extend further. A mother's death denies her children their primary caregiver<sup>26</sup> and significantly increases the risk that her infant will die or fail to survive to age five. According to a 1999 World Bank study<sup>27</sup>, the risk of death in children under five years of age is doubled if their mothers die in childbirth; and at least 20 percent of the disease burden borne by those under five was found to be attributable to conditions directly associated with poor maternal and reproductive health, nutrition, and quality of obstetric and newborn care. Research in Bangladesh revealed that motherless children up to the age of 10 have three to five times higher mortality rates than their peers who do have mothers. A mother's death also has an extremely detrimental effect on her children's access to education and health care. Girls who have lost their mothers are at especially high risk of being diverted from school to serve as caregivers for remaining family members. Among the hundreds of thousands of children who do survive without mothers, far too many risk being lost emotionally and spiritually if not physically. Maternal illness and mortality thus represent not only a personal tragedy but also a family, community and societal one.



***Excessive numbers of pregnancy- and childbirth-related injuries and deaths have profound economic and social development impacts...***

Widespread illness and deaths among mothers exact an extremely high toll on their families, communities, and countries. The resultant loss of wages by mothers, in particular, seriously impacts family welfare. A study of credit programs in Bangladesh revealed that women are far more likely than men to channel financial resources they obtain toward goods and services that benefit their families, particularly health care and education for their children.

Maternal morbidity and mortality also robs the economy of one of the most valuable of all development resources, particularly among the poorest countries—its human capital. Injuries and disabilities sustained in pregnancy reduce women's income-earning capacity by constraining their ability to work, whether in the formal or informal sector. They thus limit the potential to enhance the welfare of a woman's own family and of her country to attain desired increases in national productivity and sustained economic growth.

Importantly, guaranteeing the well-being of women and mothers must be an end in itself, not justified solely nor even predominantly on economic grounds. As is increasingly being recognized, women must be valued in their own right.<sup>28</sup> Ensuring equitable access of women and their children to quality maternal and child health care, regardless of their social or economic status, and thus positively impacting their health outcomes is a basic right that must be protected, as indeed has been repeatedly acknowledged in numerous international treaties and conventions, including the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) currently ratified by 182 countries. Progress toward ending disparities has not kept pace with the promises or rhetoric.

***Excessive numbers of maternal and newborn disabilities and deaths could be significantly reduced if not prevented...***

Over the past decade, much progress has been made in better understanding the dynamics underlying high levels of maternal mortality throughout the developing world. Existing knowledge suggests that changing household behaviors, reducing poverty, and improving physical access to health facilities are important for reducing maternal mortality in developing countries, especially to permit women to reach health services in time. Gender inequities that include restricted mobility, lack of control of family resources and decision making, and other cultural beliefs often impede women's access to services, even for life-threatening emergencies. And over this period a number of alternative approaches have been adopted by many countries to redress this pervasive problem. Yet despite increased awareness and international commitments, as WHO has underscored, only a few countries to date have implemented national programs of sufficient magnitude to effect any major reduction in maternal mortality.

The vast majority of initiatives have had limited, if any, solid evaluation of their impact. Where analyses have been conducted, they reveal that selected, widely pursued interventions such as training of traditional birth attendants and prenatal screening to identify "at risk" women have not directly resulted in significant reductions in maternal mortality *per se*. They have, however, had the positive effect of improving referral to and links with formal health systems, which is crucial to saving women's and newborns' lives.<sup>29</sup>

## *A continuum of care is needed to save mothers' and newborns' lives...*

What global experience reveals is that saving maternal and, relatedly, newborn lives will require that all women are provided a continuum of quality health care from conception through the early weeks post-delivery by a responsive health system with skilled providers. As WHO emphasizes, the challenges to do so are not technological, but rather strategic and organizational.<sup>30</sup>

Within this continuum, high priority must be assigned to ensuring all women timely, reliable access on a 24-hour basis to quality emergency obstetric care (EOC). That is because most conditions that lead to maternal deaths are not detectable in advance. Rather, they tend to arise without warning at any time during pregnancy, delivery or the postpartum period. Thus every woman is at potential risk of complications. But most maternal deaths from such complications can be averted.

In fact, the vast majority of maternal and newborn deaths occur during labor and delivery. Strategies therefore must focus on increasing the number of skilled health workers and management of complications. EOC encompasses largely simple technologies that can be delivered through relatively modest health centers and hospitals, if their personnel have been appropriately trained. Though some cases will demand attention by specialized physicians, in the vast majority of cases EOC services can be safely and effectively delivered by general doctors as well as lower trained health cadres including nurses, midwives, and non-physician surgical technicians.

Ensuring quality care both during pregnancy—the prenatal period—and the postpartum period remains, nevertheless, a corollary of any successful strategy to reduce maternal and newborn illness and death. Prenatal care is essential for the early diagnosis and treatment of some of the potential complications that may endanger the lives of both the mother and her baby. Provision of prenatal care creates a crucial entry point for pregnant women to the health system, thereby facilitating delivery of other key interventions that can significantly improve maternal and ultimately newborn health incomes. These include nutrition supplements and prevention and treatment of prevalent diseases such as malaria, tuberculosis and HIV infections. As the UN Millennium Project Task Force's Interim Report on Child and Maternal Mortality underscores, connecting a woman with the health system, assuming it is well-functioning, will be critical for saving her life if a complication does arise.<sup>31</sup>

Women and their newborns also need access to skilled providers in the immediate postpartum period. At present, such services are extremely limited and where they exist, tend to commence only some six weeks after delivery. Yet, most newborn deaths occur in the first week of life. Thus, expanding access to health care over the period immediately following delivery coupled with increasing women's knowledge of the importance of utilizing postpartum services will be crucial to saving both mothers and their infants.

In the poorest areas of the developing world where these disabilities and deaths are concentrated, however, access to this priority continuum of services is highly uneven. Poverty presents a major barrier. For example, although the majority of women globally appear to understand the importance of prenatal care, wide disparities in access to, and utilization of, these services continue to exist between and within countries. As WHO data reveal, urban women are twice as likely as rural women to have had four or more prenatal visits; and women with secondary education twice as likely as those with no education. Family income is a major determinant of prenatal service access and utilization, with women from the poorest 20 percent of families far less likely to receive such care than the richest 20 percent<sup>32</sup>.

Data compiled by the Millennium Project reveal that rich Ethiopian women are 28 times more likely than their poor counterparts to have a medically trained health provider attending their birth. In Chad and Niger this differential by income group is at least 14 to 1, in India 7 to 1 and in Sierra Leone and Angola some 3 to 4 to 1.

Provision of maternal child health services is highly cost-effective. WHO estimated the cost in 1996 to deliver the maternal component alone of an integrated Mother-Baby Package of services to redress dominant maternal and newborn health risks would be approximately US \$2 per capita in low-income countries.<sup>33</sup> More recent analyses of costs to provide a full package of first level and back up/emergency care to 101 million mothers and their babies in 2015 indicate that some US \$39 billion in additional funding (that is, above current expenditure levels) would be required. Moreover, such scaling up of essential maternal and newborn services would necessitate massive investments in production and/or upgrading of skills of health professionals, especially midwives, providers of first level care and doctors to provide back up care when needed.<sup>34</sup> Analyses carried out by the World Bank suggest that if these crucial maternal health services were rapidly scaled up to cover 99 percent of pregnant women, some 391,000 maternal deaths worldwide each year could be averted, or almost 75 percent of current deaths.<sup>35</sup>

### ***Global experience has revealed promising strategies to achieve desired health outcomes...***

Accumulated global knowledge from countries that have achieved significant and relatively rapid reductions in maternal and newborn mortality provides rich insights into strategic approaches that hold much promise for those Regions and countries at risk of not meeting this MDG. Those strategies include:

*Targeting the hardest-to-reach women and geographic areas of the country.* In Honduras investments in infrastructure and human resource development as well as mobilization of community participation, supported by external financing, -- all well-targeted to those women and areas with the highest maternal mortality ratios, -- led to the major reductions in maternal deaths achieved over the 1990-1997 period.

*Increasing health system and provider accountability for delivering priority services.* In the Yunnan province of China performance at each level of the health system is measured against a standard for “*systematic management of pregnant women*” which quantifies the essential services to be delivered at discrete levels of care. Strong incentives for compliance exist, with results used to determine not only the level of given health facility subsidies but also whether to continue employment of rural doctors and promotions for managers. Malaysia’s “*quality assurance approach*” mandates annual compilation of defined hospital care indicators, with those institutions which are outliers required to identify causes of problem areas and to address them.

*Ensuring affordability of essential maternal and newborn health care, especially for the poorest women.* In the 1990s several countries began experimenting with innovative policies to reduce financial barriers to accessing key services. Bolivia introduced a publicly financed health insurance scheme to cover a basic package of maternal and infant health care, including costs of transport to facilities. The proportion of births attended by skilled personnel increased from 24 to 34 percent between 1994 and 1998, with particularly marked improvements among women in the lowest income quintile, i.e. with such coverage increasing from 11 to 20 percent of all births in that subgroup of the population. Notwithstanding, major constraints remain to optimum utilization of services among the poorest women on which the government is now focusing its efforts.

*Scaling up services to meet increasing demand.* Continuing high population growth momentum exists in much of the developing world because of the large numbers of young women of reproductive age. The demand for maternal health services will increase substantially, necessitating significant expansion of system capacity.

*Systematically monitoring and evaluating maternal and newborn health indicators and impact of services delivered.* Introduction of such monitoring tools as participatory social audits of maternal deaths and review of “near-miss” cases could provide valuable program insights to guide service improvements. Concomitantly, greater attention is needed to evaluating the cost-effectiveness of alternative interventions at the levels of the household, community and health facility to better inform decision-making on the best use of scarce resources.

*Expanding educational opportunities for girls and women.* Investing in their education is widely acknowledged as crucial to attaining desired reductions in maternal and newborn mortality, as well as many other economic and social development objectives, as earlier discussed.

*Forging close alliances with other sectors which strongly impact maternal and newborn health outcomes.* Promoting investments in roads and infrastructure, water and sanitation are essential to expand not only access to key health services but also improve the health status of women and infants, given the heavy burden of water and sanitation-related diseases among these population groups. Among initiatives pursued have been several community-driven development programs that ensured timely, safe transport to health facilities by using local transporters paid with emergency, interest free loans, financed by the communities.

### ***Many international, regional and national commitments have been made...***

Over the past few decades, numerous commitments have been made to enhance maternal and newborn health outcomes. Among the most recent of the goals to which the industrialized and developing countries jointly committed to work are the Millennium Development Goals. The 189 countries that participated at the UN Millennium Summit in September 2000 reaffirmed the need to assign highest priority to eliminating poverty and ensuring sustained development for all countries. To these ends, they signed the Millennium Declaration, passed unanimously by the UN General Assembly. It identifies eight goals, 18 targets within them, and 48 indicators to be closely monitored to measure progress toward achievement of this desired new world order.

Key among these is Goal 5 to improve maternal health, with the quantitative target of reducing the maternal mortality ratio by three-quarters between 1990 and 2015. A key agreed indicator for monitoring progress is the proportion of births attended by skilled health personnel. Achieving this goal, as well as the other MDGs, depends greatly on sustaining momentum among those countries that have been advancing over the past decade, but most crucially on accelerating efforts among those that are falling behind. Monitoring progress is complicated in many countries by the lack of timely, reliable data required to monitor progress.

### ***Key partnerships have been established, and research is ongoing...***

Concrete steps are being taken to fulfill these commitments. Through a collaborative effort of the United Nations Population Fund (UNFPA), the United Nations Children's Fund (UNICEF), the Regional Prevention of Maternal Mortality (RPMM) Network, CARE and Save the Children, in partnership with the Maternal Death and Disability Program at Columbia University's School of Public Health in New York, work is underway to improve the availability, utilization and quality of emergency obstetric and neonatal care provided by health facilities throughout the developing world.

The launch of the Partnership for Maternal, Newborn and Child Health in 2005, representing a collaborative body spanning governments, UN agencies, nongovernmental organizations and academic institutions holds substantial potential for ensuring greater consonance of heretofore widely disparate policies, much better coordination of strategies and systematic targeting of programs and projects to priority countries at highest risk, and sharing of promising practices at the country level. It builds on a long-standing safe motherhood Inter-Agency Working Group, thus bringing a wealth of global experiences in maternal and child health. It is expected to contribute significantly to accelerating maternal and newborn mortality reductions.

Family Care International's Skilled Care Initiative aims to ensure that all women have access to high-quality, skilled care so that pregnancy-related problems can be detected and treated before they become fatal. The Initiative is working in selected poor, rural and underserved districts of Burkina Faso, Kenya and Tanzania. Of special note is its collaboration to evaluate an alternative therapy to prevent and treat postpartum hemorrhage which kills some 350 women each day globally.

The Saving Newborn Lives global initiative of Save the Children is promoting and improving the delivery of existing low-cost, low technology measures which hold promise of averting some 3 million of the 4 million deaths each year worldwide of infants during the first month of life. Among key interventions are tetanus immunizations of pregnant women, clean delivery, exclusive breastfeeding, and antibiotics for infections. With new grant financing from the Gates Foundation, its program is focused on work with partners in 20 countries in Africa, Asia and Latin America, including nine of the 10 countries with the highest infant mortality.

Ongoing analyses such as those by the Initiative for Maternal Mortality Program Assessment (IMMPACT), a global research initiative to better document the causes, costs and the consequences of maternal health problems and to provide evidence-based recommendations on effective health interventions to ensure maternal survival in developing countries are important complements.

### ***A few countries have achieved remarkable maternal mortality reductions despite substantial challenges...***

Much is known about the most promising approaches to accelerate progress toward the MDG to improve maternal health. It requires both significantly enhancing the quality and breadth of maternal health services delivered and, importantly, ensuring that women timely and effectively utilize them. Major social and economic barriers to utilization remain.

Some of the largest reductions in maternal and, relatedly, newborn mortality over the past decade or so have occurred in very low-income countries. They demonstrate that major progress can be made even within heavily resource-constrained settings. Egypt is a striking example, having more than halved

its maternal mortality rate in only eight years.<sup>36</sup> It did so through a comprehensive program to enhance the quality of maternal care, particularly management of emergency obstetric complications, coupled with substantial expansion of skilled birth attendant cadres. Honduras almost halved its maternal deaths ratio between 1990 and 1997 through establishment of referral hospitals and rural health centers and increasing the number of skilled staff. Mobilization of community support for women during pregnancy, childbirth and the postpartum period, as well as provision of reproductive health services, including family planning, have been essential corollaries. In Bangladesh and Sri Lanka, achievements in reducing maternal mortality could be directly linked to their expanded use of trained midwives and community health workers, coupled with provision of transport to ensure women with complications could reach clinics when higher levels of care were needed. In Bolivia, the National Maternal and Child Health Insurance program, a public financing scheme, has been key to helping eliminate the major economic barriers that a large proportion of women face in accessing priority maternal and infant health care. An evaluation of this insurance program indicated substantial increase in the use of skilled birth attendants and of institutional deliveries among the poorest segment of that population.

***Overall progress is still far too slow, with major, disquieting inequities...***

Notwithstanding such promising initiatives, existing data indicate that if trends observed over the past decade continue, the majority of poor countries will not meet the health MDGs. And for maternal mortality specifically, according to WHO, reductions have been limited to those countries with lower levels of overall mortality. Most importantly, countries with high maternal mortality are experiencing stagnation or even reversals in their rates.<sup>37</sup>

Amid this overall discouraging picture, some hopeful signs emerge. WHO analysis of country data reveals that the proportion of women who use a skilled attendant during childbirth, that is a medically trained health care provider, whether doctor, nurse or midwife, increased significantly between 1990 and 2003 in all Regions except Sub-Saharan Africa. (See Table 5) The largest increases in coverage of skilled care over that period were in South-Eastern Asia, where it almost doubled, i.e., increasing from 34 percent to 64 percent. Since this intervention is key to averting maternal deaths, this evokes great promise of further maternal mortality reductions.

**Table 5**

Coverage of care for women at delivery, 1990-2003		
Deliveries with a skilled attendant (%)		
Region	1990	2003
Developing regions	41	57
Northern Africa	41	76
Sub-Saharan Africa	40	41
Latin America/Caribbean	74	86
Eastern Asia	51	82
Southern Asia	28	37
South-Eastern Asia	34	64
Western Asia	61	62

Source: United Nations Statistics Division, "World and regional trends," Millennium Indicators Database, available from <http://millenniumindicators.un.org> (accessed June 2005); based on data provided by United Nations Children's Fund and World Health Organization.

Yet Sub-Saharan Africa continues to experience excessively high levels of maternal mortality, with virtually no progress made toward the goal of maternal mortality reduction over the 1990 – 2003 period. This is attributable in large part to the stagnation in the proportion of births attended by skilled health workers, which indicator rose by only one percent over that timeframe, i.e., from 40 to 41 percent of all births in that Region.

Slow progress is also the result of a veritable crisis in health human resources, particularly in the developing world, with Sub-Saharan Africa most acutely affected.<sup>38</sup> Numerous factors underlie this shortage including pervasive problems of low pay and poor working conditions and benefits within the public sector; the pull of the private sector with its better salaries and benefits; and training programs often more oriented to develop skilled medical personnel for hospital-based services than more cost-effective community-oriented providers who are also less likely to migrate. The siphoning of skilled health personnel, particularly nurses and midwives, by the industrialized world is a major contributing factor. In several developing countries, the annual exodus of health personnel strains the capacity of their training institutions to meet national needs. This out-migration results in an enormous void in skilled health attendants for mothers and newborns, particularly in the poorest countries. According to estimates within a 2002 OECD study<sup>39</sup>, developing countries supply over half of all migrating physicians and receive less than 11 percent. This foreign exodus has a high cost. The UN Commission for Trade and Development estimates that each migrating African professional represents a loss of US\$184,000 to Africa.<sup>40</sup> Increasingly this health human resource crisis is exacerbated in several Regions, including Sub-Saharan Africa and Asia, by HIV/AIDS leading to widespread absenteeism as well as death of the existing health workforce.

This lagging progress toward the maternal and child mortality MDGs should raise a major red warning flag across the international community. We are at a critical juncture with 2006 representing a little more than halfway to the 2015 target date. The time to act is now. Millions of women, infants and children at risk cannot wait.

***We have the potential to save and enhance the lives of millions of women, newborns and children, if we create the political will and act now...***

What will it take? First and foremost, achievement of the targeted 75 percent reduction in maternal mortality called for in the MDG will require that all women globally are able to access several crucial services: prenatal care; a skilled attendant for delivery coupled with a fully functioning referral system that permits women not only to reach EOC in time if and when complications arise, but receive high quality care; and postpartum and neonatal care for themselves and their infants. Significant improvements in maternal health programs, including access to reproductive health information and services is particularly crucial at this point in time, given the high population growth momentum, with an estimated 1.3 billion young women 10 to 19 years of age soon to commence their reproductive lives.

It will require investing in the education of young girls and women, given the close association between a woman's level of educational attainment and key maternal and child health outcomes.

These actions in turn will require a close partnership between the industrialized and developing world, and between the public and private sectors within developing countries. Governments urgently must improve their policies, creating the enabling environment for needed health reforms to be instituted and concomitantly increase financial resource allocations to the health and education sectors.

The international community must increase its development assistance—both technical and financial—to support committed governments in their quest to achieve the health MDGs. Estimating the costs of achieving all the MDGs is a complex undertaking, reflecting in part the many interdependencies between discrete MDGs. Notwithstanding, a World Bank analysis estimated that an additional \$40 to \$70 billion additional external assistance would be required each year. This represents approximately a doubling of current official aid flows to the developing world from their 2001 level. The Millennium Project estimates these costs to be significantly higher. What is clear is that without substantial additional resources, the ultimate objective of the MDGs to create a more equitable world will fail.

Achieving desired maternal mortality reductions requires concerted, sustained efforts in other key areas as well. These will include investments in key infrastructure such as roads and transport, communications, and in water and sanitation. It also will require attainment of gender equity in educational and employment opportunities, and relatedly significant enhancement of women’s overall status in society.

The strong voices of powerful women, working in close alliance with national governments and civil society institutions in the developing world, and with the major external entities committed to improving maternal and newborn health status globally, will be critical to realize these goals.

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<sup>1</sup> This paper draws extensively on an unpublished paper *Maternal Health and Millennium Development Goals: Challenges and Opportunities for Scaling-up* by Elizabeth Lule, the World Bank, 2004.

<sup>2</sup> WHO estimates that 211 million women become pregnant each year. Accurate measurement of maternal mortality requires comprehensive death registration systems, largely lacking in much of the developing world. Hence, maternal mortality estimates are subject to large margins of uncertainty, with the actual range potentially falling between 277,000 and 817,000, according to the UN. (From WHO, 2003, *Maternal Mortality in 2000*.)

<sup>3</sup> WHO, *The World Health Report 2005 - Make Every Mother and Child Count*

<sup>4</sup> WHO, *The World Health Report 2005 – Make Every Mother and Child Count*

<sup>5</sup> WHO, 2004, *Beyond Numbers: Reviewing Maternal deaths and Complications to Make Pregnancy Safer*. WHO: Geneva.

<sup>6</sup> Who, *The World health report 2005*.

<sup>7</sup> WHO, Department of Reproductive Health and Research, Family Planning website

<sup>8</sup> Freedman, L. et al, 2003, *Background Paper of the Task Force on Child Health and Maternal Health*. Millennium Project.

<sup>9</sup> Who, *The World Health Report 2005*.

<sup>10</sup> Per Berosjo, 2001, *What is the evidence for the role of antenatal care strategies in the reduction of maternal mortality and morbidity? Safe motherhood strategies: a review of the evidence: Vincent De Brouwere and Wim van Lerberghe (eds). Studies in Health Services Organization and Policy, 17, 2001.*

<sup>11</sup> For a discussion of opportunity costs associated with obtaining maternal health services see Thaddeus, S. and Moune, D., 1994, *Too Far to Walk: Maternal Mortality in Context* in *Social Science and Medicine*, Vol. 38. N.8

<sup>12</sup> See WHO, *The World Health Report 2005*, Chapter 4 for a discussion of these common barriers to service utilization.

<sup>13</sup> WHO, *The World Health Report 2005*.

<sup>14</sup> The lifetime risk of maternal death takes both probability of becoming pregnant and probability of dying as a result of pregnancy and cumulates them across women’s reproductive years.

<sup>15</sup> WHO/UNICEF. *Maternal Mortality in 2000. Estimates Developed by WHO, UNICEF, UNFPA.*

<sup>16</sup> The lifetime risk of maternal death is the chance that a woman will die in pregnancy or childbirth at some point of her life.

<sup>17</sup> A.T.M. Iqbal Anwar, J. Kelewo, M-E-Elabi, K. Chowdhury and S.K. Dasgupta, *Bangladesh: Inequalities in Utilization of Maternal Health Care Services—Evidence from Matlab*

<sup>18</sup> All infant and child mortality data are from the *World Health Report 2005* statistical annexes, and from the *WHO Report Neonatal and Perinatal Mortality: Country, Regional and Global Estimates, 2006*

<sup>19</sup> *Facts and Figures from the World Health Report, 2005*. Notably one in five Afghan women has a baby die during her lifetime compared to one in 125 women living in high income countries.

<sup>20</sup> For an in-depth review of the historical trends, current patterns, key factors underlying continuing high rates of neonatal mortality and key challenges to reducing these deaths see a four-part series on neonatal survival by *The Lancet*, including *Neonatal Survival 1* at [www.thelancet.com](http://www.thelancet.com), Vol. 365, March 5, 2005.



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- <sup>21</sup> WHO, 2000. Neonatal and Perinatal Mortality: country, regional and global estimates. WHO: Geneva.
- <sup>22</sup> According to WHO, 1.4 million newborns and 1.3 stillbirths occur each year in this Region. Facts and Figures from the World Health Report, 2005.
- <sup>23</sup> See 21 *asupra*.
- <sup>24</sup> WHO. Proportion of births attended by skilled health personnel: 2004 global estimates. Geneva.
- <sup>25</sup> WHO, The World Health Report 2005.
- <sup>26</sup> Women remain “primary caregiver” throughout much of the world. More fully integrating fathers in pregnancy, childbirth, bonding with newborns and parenting is essential to empower women and to enhance infants and children’s wellbeing. This has become the focus of a number of programs globally.
- <sup>27</sup> World Bank, 1999. Safe Motherhood and the World Bank: Lessons from 10 Years of Experience. Washington, DC.
- <sup>28</sup> See for example S. Thaddeus and D. Maine, 1994, “Too far to walk: Maternal mortality in context.” *Social Science and Medicine* 38(8): 1091-1110, as quoted in Nanda, Switlick and Lule, World Bank 2005.
- <sup>29</sup> Bergstrom, S. and Goodborn, E., 2001, The role of traditional birth attendants in the reduction of maternal mortality in Safe Motherhood Strategies by De Brouwere and Van Lerberghe (eds.)
- <sup>30</sup> WHO, The World Health Report, 2005.
- <sup>31</sup> UN Millennium Project Task Force Interim Report.
- <sup>32</sup> UN Millennium Project Task Force Interim Report.
- <sup>33</sup> This integrated package, the product of extensive international consultation, encompasses four widely recognized “pillars” of safe motherhood, i.e. family planning information and services to permit women to control the timing, number and spacing of pregnancies; prenatal care to prevent complications if possible or detect and appropriately treat those that can be addressed; a clean and safe delivery by skilled birth attendants, with knowledge, skills and equipment needed for both childbirth and appropriate, timely provision of postpartum care for both mothers and their newborns; and essential emergency obstetric care for high-risk pregnancies and all women facing unexpected complications.
- <sup>34</sup> Projected needs include training over the next 10 years 33,400 additional midwives or their equivalents and upgrading skills of 140,000 first level health professionals and 27,000 doctors to provide back up care. (From WHO, Facts and Figures from the World Health Report, 2005.)
- <sup>35</sup> Wagstaff, A. and Claeson, M., 2004, The Millennium Development Goals for Health: Rising to the Challenges. Washington, DC; The World Bank.
- <sup>36</sup> Egypt’s maternal mortality ratio fell from 174 per 100,000 live births in 1993 to 84 per 100,000 live births in 2000. (See WHO, The World Health Report, 2005.)
- <sup>37</sup> WHO, The World Health Report 2005.
- <sup>38</sup> On average, African countries had about 20 times fewer physicians and 10 times fewer nurses than developed countries. More than half of Anglophone African countries and almost two-thirds of Francophone African countries have less than 10 physicians per 100,000 population. This sharply contrasts with an average of 311 doctors per 100,000 population in 9 industrialized countries. See for example The State of the Health force in Sub-Saharan Africa: Evidence of Crisis and Analysis of Contributing Factors. Africa Region Human Development Working Paper Series, N. 15 (2004)
- <sup>39</sup> OECD, 2002. International Migration of Physicians and Nurses: Causes, Consequences and health policy Implications. Expert meeting paper presented for OECD Health Project, Paris, Dec. 2002.
- <sup>40</sup> World Bank, 2004, p. 12