

# Maternal Health and Survival in Pakistan: Issues and Options

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## Abstract

Although its measurement may be difficult, the maternal mortality ratio (MMR) is a key indicator of maternal health globally. In Pakistan each year over five million women become pregnant, and of these 700 000 (15% of all pregnant women) are likely to experience some obstetrical and medical complications. An estimated 30 000 women die each year from pregnancy-related causes, and the most recent estimates indicate that the MMR is 276 per 100 000 births annually. In this review, we describe the status of maternal health and survival in Pakistan and place it in its wider context of key determinants. We draw attention to the economic and social vulnerability of pregnant women, and stress the importance of concomitant broader strategies, including poverty reduction and women's empowerment. Undernutrition for girls, early marriage, and high fertility rates coupled with unmet needs for contraception are important determinants of maternal ill health in Pakistan. Our review also examines factors influencing the under-utilization of maternal health services among Pakistani women, such as the lack of availability of skilled care providers and poor quality services. Notwithstanding these observations, there are evidence-based interventions available that, if implemented at scale, could make important contributions towards reducing the burden of maternal mortality in Pakistan.

## Résumé

Bien que sa mesure s'avère difficile, le taux de mortalité maternelle (TMM) constitue un indicateur clé de la santé maternelle à l'échelle mondiale. Chaque année, au Pakistan, plus de cinq millions de femmes deviennent enceintes; 700 000 d'entre elles (15 % de toutes les femmes enceintes) sont susceptibles de connaître certaines complications obstétricales et médicales. On estime que 30 000 femmes meurent chaque année en raison de causes liées à la grossesse; les estimations les plus récentes indiquent que le TMM est de 276 par 100 000 naissances annuellement. Dans le cadre de cette analyse, nous décrivons l'état de la santé et de la survie maternelles au Pakistan et nous le replaçons dans le contexte plus étendu des déterminants clés. Nous attirons l'attention sur la vulnérabilité économique et sociale des femmes enceintes, et soulignons l'importance de mettre en œuvre des stratégies élargies concomitantes, dont la réduction de la pauvreté et l'habilitation des femmes. La dénutrition des filles, le

mariage hâtif et les taux élevés de fertilité, conjointement avec les besoins inassouvis en matière de contraception, constituent d'important déterminants du piètre état de la santé maternelle au Pakistan. Notre analyse examine également les facteurs qui influencent la sous-utilisation des services de santé maternelle chez les Pakistanaises, comme les lacunes quant à la disponibilité de fournisseurs de soins qualifiés et la piètre qualité des services offerts. En dépit de ces observations, il existe des interventions fondées sur des données probantes qui, si elles étaient mises en œuvre dans une plus large mesure, pourraient contribuer de façon importante à la réduction du fardeau de la mortalité maternelle au Pakistan.

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## INTRODUCTION

Improving maternal health and reducing maternal mortality remains at the centre of global health initiatives. The most recent estimate shows that worldwide, in 2006 alone, close to half a million women died of maternal causes. About 99% of the fatalities took place in developing countries, and slightly more than half occurred in the sub-Saharan African region alone, followed by South Asia. The Millennium Development Goal 5 calls for a 75% reduction in global and country-specific maternal mortality between 1990 and 2015. Pakistan is among countries with high fertility and maternal mortality rates and is a signatory to achieving the MDG 5 targets. Despite advances in medical technology, maternal mortality remains high in Pakistan: an estimated 30 000 women die each year because of obstetric complications, translating to one woman dying every 20 minutes. A disproportionate majority of these deaths occur in rural areas and urban slums.

Maternal mortality is a persistent tragedy that continues to confront and challenge the policy makers of Pakistan, and is compounded by the fact that it is difficult to measure. The problem of maternal mortality can be understood within the context of the larger issue of women's health and health-related development of the country. In Pakistan each year nearly five million women become pregnant, and, of

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these, 700 000 (15% of all pregnant women) are likely to experience some obstetrical and medical complications. Twenty percent of adult female deaths are attributed to maternal causes (complications during pregnancy, childbirth, and up to six weeks post birth), with most women below the age of 20 and above 40 dying of pregnancy-related issues.<sup>1</sup>

### **PAKISTAN: DEMOGRAPHIC PROFILE AND TRENDS**

Pakistan's estimated population in July 2008 was 172 million. Approximately 22% are women aged 15 to 49 years, with a crude birth rate of 32 per 1000 population (1996–1997).<sup>2</sup> Few women aged 15 to 49 years have formal schooling: 75% have none, 10.5% have primary education, and 6% have more than secondary education. Women of reproductive age constitute 23% of Pakistan's population.

An estimated 30 000 Pakistani women, one in every 23, dies of causes related to childbirth, compared with one in 5000 women in developed countries. Sixty-five percent of women in Pakistan deliver their babies at home, and only 8% of home births are supervised by a trained attendant. However, some improvements have been seen in relation to maternal health in Pakistan, as evidenced by comparison of data from studies that have used the same instruments, such as the Pakistan Integrated Household Survey of 2001 and the Pakistan Social Living Standards Measurement Survey of 2005. Over a 10-year period (from 1996–1997 to 2005–2006), the percentage of pregnant women who had at least one antenatal consultation with a caregiver increased from 30% to 50%, the proportion of women receiving postnatal consultations increased from 11% to 23%, and the proportion of births attended by skilled birth attendants increased from 18% to 31%. Contraceptive prevalence also increased from 12% in 1991 to the reported 2001 level of 27.6%. There are also indications of increased utilization of health care facilities, particularly in the private sector, as evidenced by the increase in the percentage of postnatal consultations from 35% in 1998–1999 to 46% in 2004–2005.<sup>3,4</sup> The total fertility rate for all Pakistan was recorded at 6.2 in 1970–1975,<sup>5</sup> and 5.4 in 1986–1991.<sup>6</sup> However, fertility is higher in the rural areas (TFR of 5.7, according to the Pakistan Fertility and Family Planning Survey 1996–1997),

for all of Balochistan (6.7) and among uneducated women (6.0). Women rarely work for money (only 20% do so); they bear many children (TFR = 5.4), and generally do not use modern contraception (17%). The mean age at first marriage is 22 years for women.<sup>2</sup>

### **MATERNAL MORTALITY TRENDS AND DIFFERENTIALS**

Pakistan, in common with many other developing countries, has an unacceptably high maternal mortality rate (maternal deaths per 1000 women) and maternal mortality ratio (maternal deaths per 100 000 live births). As indicated in Figure 1,<sup>7</sup> Pakistan's MMR is high and is exceeded only by the MMR of countries such as Afghanistan and Nepal.

There is also an issue with measurement. According to the Planning Commission estimates, indirect estimates of MMR ranged from 350 in 2000–2001 to 400 per 100 000 live births in 2005 (Figure 2). Reversing this trend, which falls short of the Poverty Reduction Strategy Paper target of 300 to 350 per 100 000 live births, will require a multifaceted approach to the health of women before, during and after pregnancy. The overall maternal mortality ratio, as measured in the most recent Pakistan Demographic and Health Survey 2006–2007, was 276 maternal deaths per 100 000 births. This is slightly lower than the generally accepted previous estimates of around 320 maternal deaths per 100 000 births.

The recent estimates by PDHS show that the maternal mortality ratio in Pakistan is about 276 per 100 000 live births, i.e., 1 in every 89 women in Pakistan will die of maternal causes.<sup>1</sup> With regard to patterns by residence, mortality rates are generally higher in rural areas than in urban areas, with a rate of 319 per 100 000 live births in rural areas of Pakistan and 175 per 100 000 live births in urban areas. Community-based studies suggest that the MMR in Pakistan ranges between 300 and 700 per 100 000 live births. The estimated provincial level MMR, based on the recent PDHS 2007, is shown in Figure 3.<sup>1</sup>

The studies conducted in large teaching hospitals in the public sector typically report MMRs that are significantly higher than those from community-based studies. Hospital-based studies overestimate or underestimate the MMR depending on the population they serve. Two extreme examples are a study done in Civil Hospital Karachi in 1979–1983,<sup>8</sup> which reported the MMR of 2736 per 100 000 live births, and a study from Aga Khan University Hospital of Karachi,<sup>9</sup> which reported the MMR of 20 per 100 000 live births among booked clients during 1988–1999. Even among hospitals, the figures vary greatly according to whether the hospital is in the public or private sector, and also between cities. In a private tertiary hospital in Karachi, the MMR was reported as 28 per 100 000 live births,

### **ABBREVIATIONS**

LHW	Lady Health Workers
MDG	Millennium Development Goals
MMR	maternal mortality ratio
MNCH	Maternal, Newborn and Child Health Program
PDHS	Pakistan Demographic and Health Survey
TBA	traditional birth attendant
TFR	total fertility rate

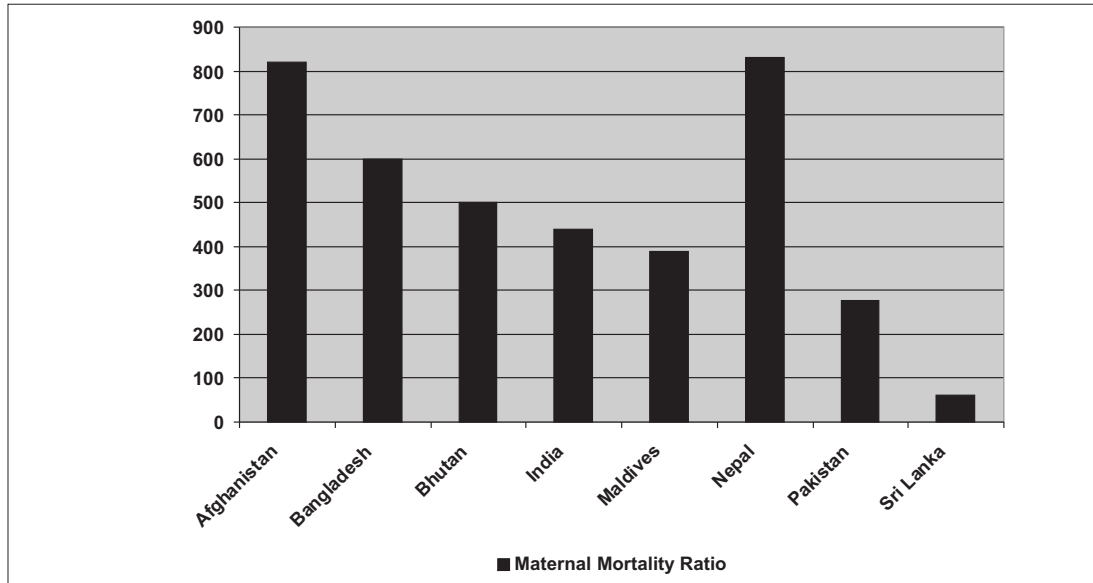
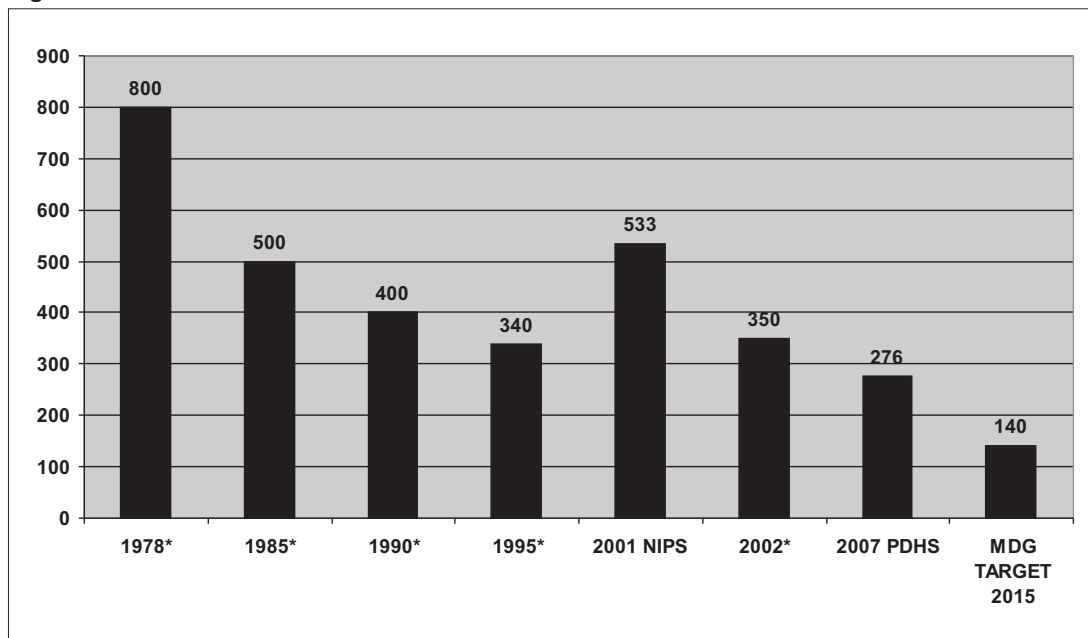
Figure 1. Comparison of MMR in South Asia Region<sup>7</sup>

Figure 2. Trends of MMR in Pakistan



Source: \*Government of Pakistan. Planning Commission, Islamabad, Pakistan.  
NIPS: National Institute of Population Studies

whereas in public hospitals the MMR ranges from 225 in Lahore to 1442 in Peshawar and 2608 in Hyderabad.<sup>10</sup>

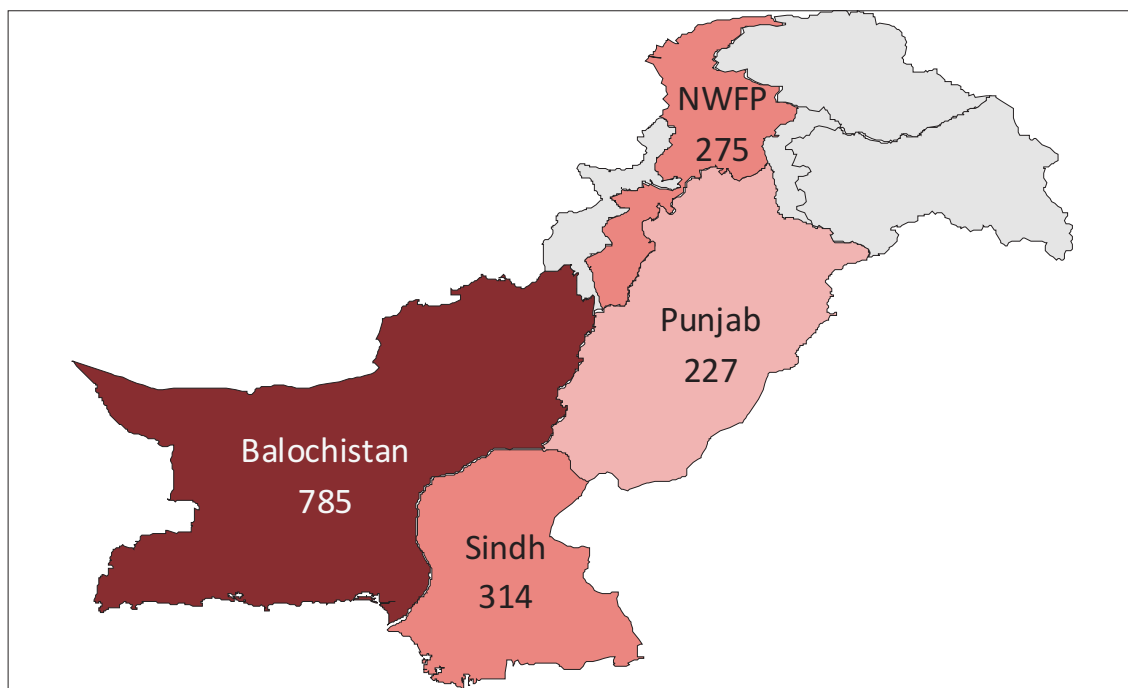
### CAUSES OF MATERNAL MORTALITY IN PAKISTAN

The specific causes of maternal mortality are multiple, inter-related, complex, and almost always preventable. Complications of pregnancy and delivery are the leading causes of death and disability among women of childbearing age.

Hemorrhage, whether antepartum, postpartum, or related to abortion or ectopic pregnancy, remains one of the major killers of childbearing women all over the world. In Pakistan,

audits of the causes of maternal mortality in public and private hospitals point towards postpartum hemorrhage as the main cause of death associated with childbirth. Direct maternal deaths constituted 86.2%, while indirect deaths were responsible for 13.8% of maternal mortality<sup>11</sup> (Table 1).

The recent PDHS 2007<sup>1</sup> obtained nationally representative data on maternal mortality from standardized verbal autopsies (Figure 4), and indicates that the common direct causes of maternal death are postpartum hemorrhage (27%), puerperal sepsis (14%), and eclampsia/toxemia of pregnancy (10%).<sup>1</sup> This favours the findings of other hospital studies,

**Figure 3. Maternal mortality ratio per 100 000 births, for the 3 years before the survey**

Pakistan Demographic & Health Survey (2007)  
 NWFP: North-West Frontier Province

in which over 80% of deaths are also from direct causes. Only 13% of maternal deaths are attributed to indirect causes, which include complications of infectious diseases such as hepatitis, cancer, and gastrointestinal disorders.

Complications of pregnancy and childbirth are major causes of death and disability among women of reproductive age in Pakistan. Most maternal deaths are attributed to delays in getting medical care during obstetric complications. The first delay is partly due to household constraints, i.e., ignorance on the part of women's families and birth attendants (usually traditional midwives) that delays the decision to seek medical care. The second delay occurs once the decision to seek medical care has been made, when precious time is lost in transporting women to hospitals because of the lack of telephones and regular ambulance services. The third delay occurs at the hospital and is largely due to the unavailability of trained staff, a lack of supplies and equipment, and poorly organized emergency services. Delays resulting from inappropriate maternity services (21%), access to health services (36%), and decision-making at the family level (34%) contributed largely to the deaths of 150 pregnant or recently delivered women who were brought dead to Jinnah Postgraduate Medical Centre during a 12-year period (1981–1992).<sup>18</sup>

#### **DETERMINANTS OF MATERNAL MORTALITY**

Notwithstanding the aforementioned causes of maternal deaths, there are underlying determinants that contribute to

the problem in a fundamentally important manner. Failure to address these issues underlies the failure of many intervention strategies.

#### **Poverty**

Poverty underlies the poor health status of developing country populations, and women represent a disproportionate share of the poor. Furthermore, the cultural and socioeconomic environment affects women's exposure to disease and injury, their diet, their access to and use of health services, and the manifestations and consequences of disease. Pakistani women are trapped in a web of dependency and subordination because of their low social, economic, and political status in society. The majority of women suffer from all forms of poverty. In all regions reproductive health continues to be worst among the poor. Poverty is rampant in the rural areas of Pakistan, where people are in a state of deprivation with regard to incomes, clothing, housing, health care, education, sanitary facilities, and human rights. Women in the poorest households have much higher fertility rates than those in the wealthiest, and far fewer births are attended by skilled health professionals, contributing to higher maternal mortality ratios. Although there are no reliable estimates of maternal mortality by income quintiles, a sense of the differentials can be obtained from urban rural comparison in the PDHS 2007<sup>1</sup> (urban MMR 175 versus 319 in rural populations).

**Table 1. Maternal deaths by underlying cause of death in different studies (2002-2008)**

Information source	Direct causes (%)					Indirect causes (%)			
	Hemorrhage	Eclampsia	Sepsis	Obstructed labour/rupture of uterus	Abortion	Pulmonary embolism	Severe anemia	Hepatitis	Heart disease
Rahim <sup>11</sup> Lady Reading Hospital Peshawar	42.2	24.6	9.7	10.4		7.8			
Sultana <sup>12</sup> Women & Children Hospital DHQ (W&C), Dera Ismail Khan	57.5	16.7	5.4	13.9					
Quddusi <sup>13</sup> Nishtar Hospital Multan	35.4	23.0	14.0		6.2		10.1		
Farooq <sup>14</sup> Five districts of North West Frontier Province	21.0	18.6	13.3		11.0				
Begum <sup>15</sup> Ayub Teaching Hospital, Abbottabad	34.6	30.7							
Nabila <sup>16</sup> Liaquat University Hospital, Hyderabad	20.9	30.2	18.6	6.9		9.3	4.6	6.9	2.3
Shah <sup>17</sup> Civil Hospital, Karachi	23.3	34.2	9.2	7.2	10.5		1.3	0.6	0.6

## Female Empowerment

In terms of the United Nations Development Program gender empowerment measurement, Pakistan lies 100th out of 102 countries, which shows that Pakistan has a long way to go with regard to the promotion of gender equality and empowerment of women. This lack of empowerment has severe repercussions on the health and self-respect of women and their children. In Pakistan (and mostly in rural regions) women suffering from an illness seek health care less frequently than men. Having a subjugated position in the family, women and children need to seek the permission of the head of the household or the men in the family to visit health services.<sup>19</sup> The poor social status of women and their lack of empowerment also contribute greatly to the lack of fertility regulation and rapidly increasing population growth rates.<sup>20</sup>

Obviously the most ominous sign of women's low social status in Pakistan is the pervasive violence against them; this is commonly justified on the basis of either religion or culture. Gender inequities can restrict women's access to health services in a variety of ways. Traditions in the family play a fundamental role in developing a girl's physical, social, and mental health status. Cultural values are embedded deeply in the family traditions, making her access to health care limited and most of the time dependent on the family's decision.<sup>21</sup> Barriers imposed by the community play a primary role in opposing women's empowerment, resulting in poor health indicators. Disregarding girl's education, restricting the decision-making powers and the mobility of women, and misinterpreting religious teachings are some of

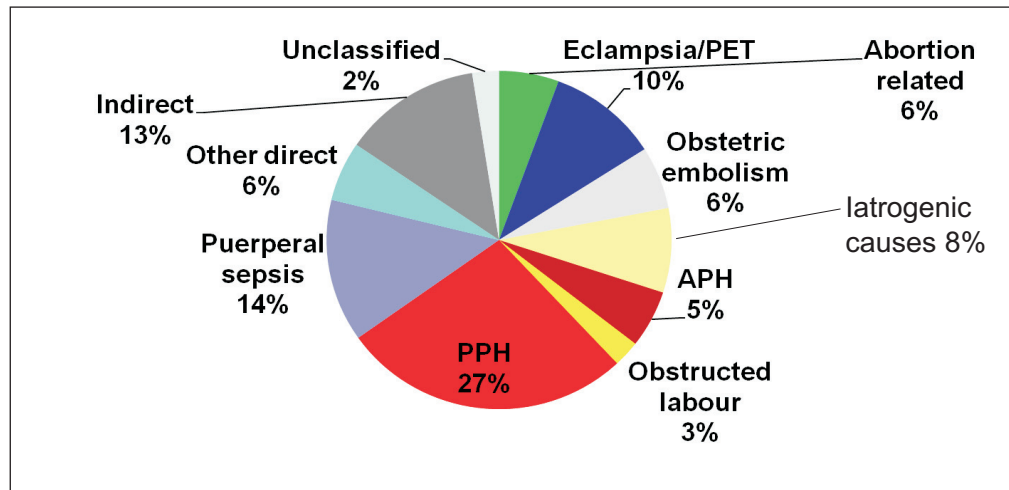
the many community-instituted barriers. Such a situation can lead to the death of a parturient or to future morbidity.<sup>22</sup> A significant factor inhibiting the empowerment of women and better health status is lack of support from the husband's family. The proportions of populations accessing various health services according to residence and distance from health services are shown in Table 2.

## Other Contributing Factors

### Undernutrition

Maternal undernutrition remains pervasive and is a critically important determinant of healthy pregnancy outcomes for both mother and baby. The prevalence of malnutrition in Pakistan among lactating and pregnant women is high, and, with the exception of maternal anemia rates, is largely resistant to change. The National Nutrition Survey 1985–1987 reported that maternal malnutrition affected 34.2% of pregnant women who were severely underweight, while the National Nutrition Survey 2001–2002 showed that 12.5% of non-pregnant and 16.1% of lactating mothers were malnourished.

In the group aged 25 to 44 years, the prevalence of malnutrition falls to 30% for rural women and 20% for urban women. In selected urban squatter settlements in Karachi, pregnant women were likely to suffer from chronic mild malnutrition.<sup>24</sup> Women in Pakistan suffer from deficiencies of several critical micronutrients such as iron, vitamin A, zinc, and iodine. The clinical signs of vitamin A, zinc, and iron deficiency in mothers were 9.4%, 41%, and 48.7% respectively. Iron deficiency is the most prevalent, affecting

**Figure 4. Causes of maternal mortality in Pakistan based on standardized verbal autopsies**Pakistan Demographic & Health Survey (2007)<sup>1</sup>**Table 2. Proportion of rural women reporting restricted access to health facilities in Pakistan<sup>23</sup>**

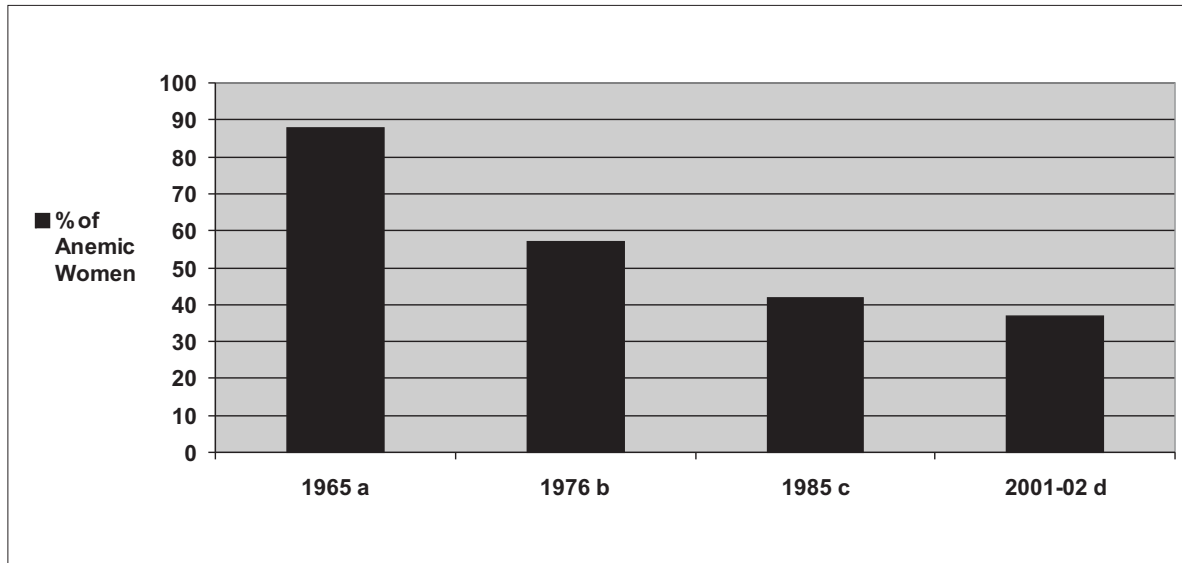
Travel time to Facility	Cannot go alone		Need permission	
	< 1 hour	≥ 1 hour	< 1 hour	≥ 1 hour
Hospital	65	78	81	91
Rural health centre	49	74	66	89
Basic health unit	62	82	84	93
Dispensary	71	87	88	94
Private hospital/clinic	49	72	71	88
Private doctor	61	87	85	94
Hakim	50	60	75	85
Homeopath	27	40	56	80
Pharmacy	61	67	78	86

nearly 96% of pregnant women in Pakistan.<sup>25</sup> Anemia was more common in women with less education, belonging to low socioeconomic groups and of increasing parity. Iron deficiency was found in 72.7% of anemic women.<sup>26</sup> While trends in maternal anemia (Figure 5) indicate that rates might be decreasing, it must be pointed out that the sample of women of reproductive age in the last national nutrition survey was small and not sized for national representation. The recent PDHS showed that women in major urban areas are more likely (33%) to receive vitamin A supplements than those in rural areas (18%). At the provincial level, the percentage of women who reported receiving a postpartum vitamin A dose was highest in Sindh province (31%). With regard to educational level, women with no education (16%) are least likely to receive vitamin A doses during pregnancy.<sup>1</sup>

A two-pronged strategy to improve women's nutrition is needed. The first aims to decrease energy loss by reducing unwanted fertility, preventing infections, and lessening a heavy physical workload. The second focuses on increasing intake by improving the diet, reducing inhibitors that limit the efficiency of food absorption, and providing food and micronutrient supplements.

### High fertility rate

With 137 million inhabitants, Pakistan is the sixth most populous nation in the world. According to United Nations projections, the population will grow to 285 million by 2050, at which time Pakistan will rank as the world's fourth most populous country. The main reason for this huge projected increase and the rise in relative ranking is the slow pace of decline in fertility, which in turn is related to poor

**Figure 5. Percentage of women of reproductive age with anemia in Pakistan (1965-2002)**

a. Government of Pakistan. Nutritional Survey of West Pakistan, 1965-66. Islamabad, Pakistan: Planning Division; 1970.

b. Government of Pakistan. Micronutrient Survey, 1977. Islamabad, Pakistan: Planning Division; 1977.

c. Government of Pakistan. National Nutrition Survey, 1985. Islamabad, Pakistan: Planning Commission and UNICEF; 1985.

d. Government of Pakistan. National Nutrition Survey, 2001-02. Islamabad, Pakistan: Planning Commission and UNICEF; 2002.

rates of female education, empowerment, and unmet needs for family planning.

Although there has been a decline in the total fertility rate, from 5.4 children per woman in 1990–1991 to 4.1 children in 2006–2007, conspicuous differentials in fertility are found by level of women's education and wealth quintile. The TFR is 2.5 children lower among women with higher education than among uneducated women. The difference between the poorest and richest women is nearly three children per woman. Another reason for high fertility rates is a lack of contraceptive knowledge among women; although 96% of women know at least one modern method of contraception, only 64% can name a traditional method. The prevalence rate of modern contraceptive use among married women is 29.6%. Only 30% of women use any method.<sup>1</sup>

#### **Lack of evidence-based interventions and poor quality health services**

Notwithstanding the above, a major cause of poor rates of seeking health care services in the public sector is the poor quality of services or lack thereof. A lack of skilled birth attendants and limited access to emergency obstetric and newborn care services underlie the stagnant rates of facility-based births. In recent years the government of Pakistan has developed programs, most of them in collaboration with donor agencies, to improve maternal health status. Most of the program-based interventions are led by the federal government with implementation arms at the provincial and district levels.

Historically, several programs have been developed to improve maternal health and birth outcomes. The major programs instituted so far have included the following:

#### **Traditional Birth Attendant training**

TBAs attend about three quarters of the deliveries in Pakistan. In the past, many organizations, including UNICEF, UNFPA, and the World Bank, were committed to TBA training as a method for improving delivery practices. The TBA training included basic understanding of the anatomy of the reproductive organs, providing postnatal follow-up counselling, and educating women on breast-feeding, safe delivery methods, sexually transmitted diseases, family planning, and child spacing. The TBAs were also provided with disposable safe delivery kits and instructions to identify birthing complications in time and refer cases to the nearest hospital. There is no evidence that TBA training programs in Pakistan had any impact on maternal mortality or morbidity, although many programs reported improved knowledge, skills, and performance of their TBAs for some time after training. Generally it is believed that these programs failed to cause a significant decline in maternal mortality, mainly because there was no follow-up, supervision, or support system for the TBAs trained under this program.

#### **Family planning strategies and primary health care**

After major investments in the family planning programs of the 1960s, which were largely implemented as vertical

programs, the Prime Minister's Program for Family Planning and Primary Health Care was launched in 1994. Its name was changed in 2001 to the National Program for Family Planning and Primary Health Care, and it is commonly called the Lady Health Workers Program. This program focuses on delivering essential primary health care services to communities at their doorstep through female community health workers, creating a link between the health system and the grassroots level, and resulting in services provided to women who for cultural reasons cannot leave their homes. The training of LHWs includes education about the care of the woman during pregnancy, including identification of high-risk mothers, counselling for tetanus toxoid vaccination, counselling for iron-folate dietary supplementation, and appropriate nutrition. They are also taught to recognize complications of delivery, including prolonged labour, excessive bleeding, malpresentation, eclampsia, cord around the neck, foul-smelling vaginal discharge, uterine atony, and retained placenta. Their 14-month initial training curriculum also focuses on appropriate breastfeeding including the importance of colostrum, and recognition of tetanus, conjunctivitis, and jaundice in the neonate; however, there is no reference to neonatal sepsis.

Currently some 96 000 female community-based LHWs deliver preventive, maternal and child health and family planning services to women and children, covering about 55% of the total population, mainly in rural areas. The program has had a positive impact on outcomes such as immunization coverage, prenatal care, attendance at delivery, and contraceptive prevalence, even after correcting for those living in better areas with easier access to health facilities. The third evaluation in 2001–2002 showed that immunization coverage was 56% in LHW-covered areas compared with 38% in non-LHW-covered areas; similarly, the contraceptive prevalence rate in areas covered by LHWs was 30% compared with 21% in non-LHW areas. Since the last evaluation, the program has been expanded from 38 000 to 96 000 LHWs, and a follow-up evaluation is currently underway. Notwithstanding the achievements of the LHW program in promoting preventive strategies for almost 50 million people, the program has only 60% coverage in rural populations and uneven linkage with existing TBAs. Given that LHWs do not attend deliveries, and despite the feasibility of delivering primary care interventions, the program has had limited impact on major issues affecting maternal survival.

### **National Maternal, Newborn and Child Health Program**

This program was initiated in 2006 with a specific focus on MDGs 4 and 5 and is intended to strengthen, upgrade, and

integrate ongoing interventions and to introduce new strategies. The overarching goal is to improve the accessibility of quality MNCH services through development and implementation of an integrated and sustainable MNCH program at all levels of the health care delivery system and through functional integration of the ongoing maternal programs, i.e., the National Program for Family Planning, Primary Health Care, EPI, Nutrition, and the National AIDS Control Program. The salient feature of this program is that it adds to what is already being done to achieve the MDGs, and thereby acts as a catalyst to assist the ongoing initiative to fulfil the health-related MDGs. The MNCH program is intended to provide improved access to high quality maternal and child health and family planning services in all health outlets, including comprehensive emergency obstetric and newborn care services in 275 hospitals and in 550 health facilities. The program aims to enrol 10 000 community skilled birth attendants with the goal of increasing demand and utilization of MNCH services by the poor.

During the period 1990 to 2002, three national health policies were announced in Pakistan (in 1990, 1997, and 2001). Although all policies and programs emphasized maternal health, safe motherhood, and the availability of female staff, ensuring the provision of emergency obstetric care received inadequate emphasis. However, as can be seen above, the emphasis so far has been on some preventive strategies without a concerted effort at scaling up skilled care in district health systems. Transport systems for emergency maternal transport, blood banking services, provision of adequately remunerated posts for district level female obstetricians and medical officers, and adequate in-service training of existing staff are evident needs that have not been met. While there is an effort to do so in the recent most MNCH program, the allocated resources are far below what is required.

### **WHAT NEEDS TO BE DONE?**

Pakistan has made slow progress during its 59-year history in improving its maternal health indicators. While programmatic efforts for improving maternal health and increasing the range of preventive services have been made, implementation has been poor. Pakistan needs to ensure that wise intentions are translated into high quality, accessible services and programs at the local level. In some aspects there are large disparities in the access to services between rural and urban populations. In addition to challenges that are impeding the contribution to the continuing high level of maternal mortality, such as the lack of emergency obstetric care and trained personnel particularly in rural areas, there are other constraints that affect the provision of family planning information and services. High levels of maternal mortality and morbidity in Pakistan are a direct result of

**Table 3. Impact of maternal interventions on maternal mortality in Pakistan at varying coverage rates<sup>28</sup>**

Maternal Interventions	Current estimated Coverage in Pakistan (%)	Death averted at pragmatic coverage (%)	Death averted at 99% coverage (%)
Promotion of reproductive health and family planning	25	8.1	24
Basic 4 visit antenatal care package including	<b>61</b>	<b>2.7</b>	<b>11.2</b>
1. Seeking skilled care for childbirth (in community) but including breech detection, twins, and abnormal lie	39	0	0
2. Tetanus toxoid	60	0	0
3. Iron and folate administration	43	0.4	0.8
4. Screening of UTI and UTI management	10	1.1	5.0
5. Hypertension screening and treatment for severe hypertension	10	1.2	5.4
Enhanced ANC package		<b>1.2</b>	<b>4.1</b>
1. ASA	5	0.2	1.5
2. Calcium	0	0.8	2.7
Antibiotics for preterm rupture of membranes and suspected chorioamnionitis and post abortion care	10	1.3	5.9
Basic obstetric care (clean delivery)	31	2.0	7.2
Basic obstetric care (active management of third stage of labour, including misoprostol, oxytocics, ergotamine and manual removal of the placenta), including D&C for post abortion care	25	5.2	15.4
Basic obstetric care for eclampsia (magnesium sulphate)	0	0.8	2.7
Emergency obstetric care (including blood transfusion and LSCS)	15	3.7	20.6
ITN/IPT in pregnancy in malaria endemic areas	7	0.6	2.4

ITN insecticide-treated nets  
IPT intermittent preventive treatment

the interplay between a variety of factors: low status of women in society, poor nutrition, a significant proportion of high-risk pregnancies, poor access to health services, poverty, and illiteracy. Women's health cannot be improved without addressing each of these issues, and without moving from the traditional culture of birthing to a modern system of maternal and child health services.

Over the last few years the evidence base for interventions and strategies that can improve maternal health and nutrition outcomes has significantly improved.<sup>27,28</sup> It is also recognized that these interventions can be delivered across a continuum of maternal and newborn care and can influence health and survival for both mother and neonate.<sup>29</sup> It has also been underscored that if delivered in primary care settings, these integrated interventions could save between 30% and 40% of maternal lives currently being lost.

Currently available and potential interventions to address maternal health and survival in Pakistan are shown in Table 3. Based on estimates of efficacy and a cohort model of impact developed and tested for Pakistan,<sup>29</sup> we estimate that delivering these packages of care at pragmatic and universal levels of coverage could prevent a large proportion of

maternal deaths in both primary care settings and referral facilities. The prerequisites for scaling up such interventions are investments in the public sector health system and innovative financing strategies to provide incentives for quality care and public-private partnerships.

## **CONCLUSION**

Although Pakistan has one of the highest rates of maternal mortality in the South Asian region, most of the causes of maternal morbidity and mortality can be addressed by health system interventions, social sector reform, and human development. We have evidence-based interventions that work and strategies to promote scaling up of such interventions in health systems, especially in district settings, and estimates based on a cohort model indicate that a steady pragmatic increase in coverage over the next five to six years would allow Pakistan to reach its MDG targets for maternal mortality. The key assumption, of course, is that these interventions can be implemented effectively with close monitoring of progress and accountability.

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