

# MAKING MOTHERHOOD SAFER IN EGYPT

by Karima Khalil and Farzaneh Roudi-Fahimi

Fewer Egyptian women die of maternal causes today than they did 10 or 15 years ago, thanks in large part to the national safe motherhood program. Nevertheless, maternal mortality in Egypt is still relatively high, and the country faces challenges in reducing it further. Many of these challenges involve addressing the delays women face when they need essential obstetric care. In Egypt and other countries, most maternal deaths could be avoided if women had timely access to high-quality emergency obstetric services.

Every year about 1,400 Egyptian women and half of their newborns die from complications related to pregnancy and childbirth. Although this level of maternal mortality (84 maternal deaths per 100,000 live births) is relatively high by international standards, recent evidence suggests that a woman's lifetime risk of dying from maternal causes in Egypt has dropped dramatically, from 1 in 120 to 1 in 250 during the 1990s.<sup>1</sup>

Egypt's maternal-mortality success story can be told because the country conducted two nationally representative studies less than 10 years apart. These studies make an exceptional and valuable contribution to the world's understanding of safe motherhood, a health issue for which there is generally a lack of reliable data. The studies' findings also provide insights into the programmatic elements associated with maternal survival.

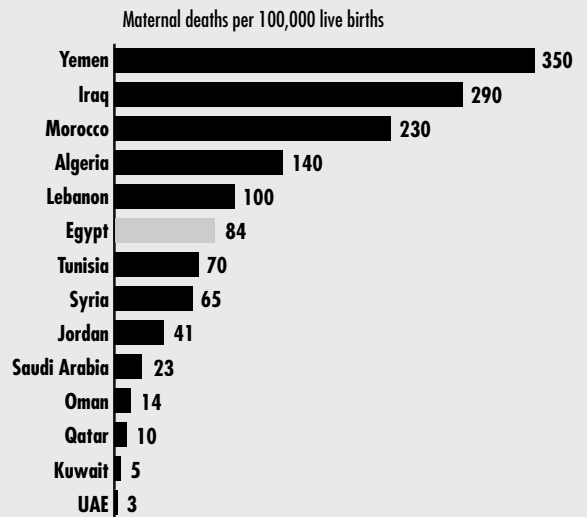
This policy brief describes Egypt's efforts to reduce maternal deaths—a process that can offer valuable lessons for other countries in the Middle East and North Africa (MENA), as well as for the rest of the developing world.

## A Key Health Challenge

Worldwide, it is estimated that half a million women die annually from maternal causes, 99 percent of which occur in the developing world. Maternal deaths, largely avoidable, are strongly associated with the absence of good medical care before, during, or after delivery. It is estimated

Figure 1

### Maternal Mortality in Selected Countries



SOURCE: Farzaneh Roudi-Fahimi, *Women's Reproductive Health in the Middle East and North Africa*.

that about 10 percent to 15 percent of all deliveries develop life-threatening complications and require immediate, skilled medical intervention (see Box 1, page 2).<sup>2</sup>

The 2002 Arab Human Development Report calls maternal mortality a “key health challenge” and points out that the region's level of maternal mortality is twice that of Latin America and the Caribbean, and four times that of East Asia.<sup>3</sup> Roughly 13,000 women in the Middle East and North Africa die each year of complications related to pregnancy and childbirth.<sup>4</sup> Only two countries in the region, Kuwait and the United Arab Emirates, have levels of maternal mortality considered low by international standards (a maternal mortality ratio of not more than 5 maternal deaths per 100,000 live births). Compared with other countries in the region, maternal mortality is relatively low in Oman, Qatar, and Saudi Arabia, yet it is higher than in countries outside the region that have comparable per capita incomes.

Box 1

### The Challenge of Measuring Maternal Mortality

A maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy from any cause related to or aggravated by the pregnancy or its management. The maternal mortality ratio (MMR)—the number of maternal deaths per 100,000 live births—is an indicator that analysts and women’s health advocates often use to describe the magnitude of maternal deaths in a country.

Data on maternal mortality can be collected through vital registration, families and hospital surveys, or a combination of these two methods, but each method has its own limitations. Not all countries list maternal causes as a reason for death in their official death records. Also, where there is a system for registering and reporting maternal deaths, not necessarily all the causes of maternal deaths are recognized by the medical system and classified correctly. In addition, many women die outside the health system, which means that their deaths may either go unrecorded or are misclassified.

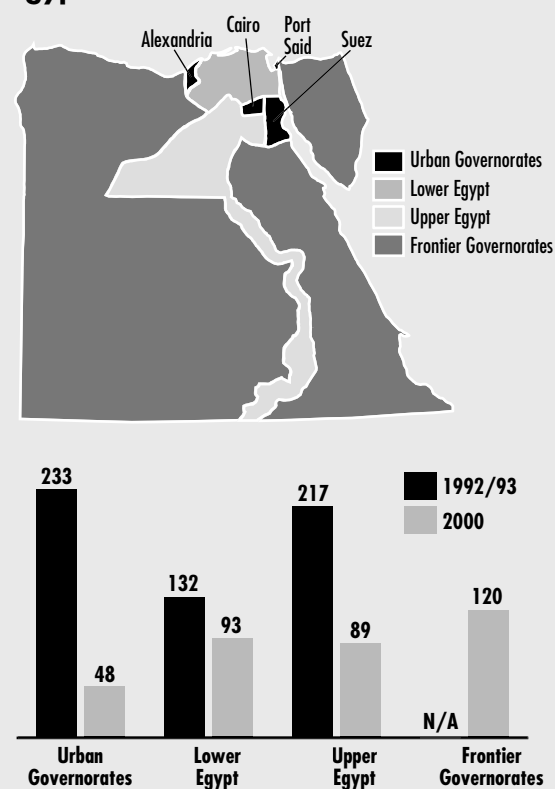
Since maternal deaths are relatively rare events, conducting surveys to collect data on maternal mortality requires a large sample size. As a result, it becomes a very expensive undertaking and hardly affordable, particularly by resource-poor countries that often have high maternal mortality and in fact need such data for developing appropriate policies and programs to reduce their maternal mortality. Data collected through surveys are generally based on asking families who know of a patient or family member who died due to pregnancy or related causes. This approach also has its own biases: family members recollection, knowledge, and willingness to report accurately. Shame and embarrassment compound these problems. As a result, many maternal deaths can go unrecorded—especially deaths from illegal abortions.

Generally in the developing world, because of the lack of reliable and adequate data, experts warn that MMR estimates should be used very cautiously. MMR estimates are generally believed to be too low. Despite the shortcomings, however, this measurement remains an important development indicator whose progress is to be monitored by the international community as part of the Millennium Development Goals.

**SOURCES:** United Nations Children’s Fund (UNICEF), World Health Organization (WHO), and United Nations Population Fund (UNFPA), *Guidelines for Monitoring the Availability and Use of Obstetric Services* (New York: UNICEF, October 1997); Kenneth Hill, Carla AbouZahr, and Tessa Wardlaw, “Estimates of Maternal Mortality for 1995,” *Bulletin of the World Health Organization* 79, no. 3, 2001; Oona Campbell et al., *Lesson Learnt: A Decade of Measuring the Impact of Safe Motherhood Programmes* (London: London School of Hygiene and Tropical Medicine, 1997); WHO, *Reduction of Maternal Mortality: A Joint WHO/UNFPA/UNICEF/World Bank Statement* (Geneva: WHO, 1999); and United Nations, *Implementation of the United Nations Millennium Declaration, Report of the Secretary General, July 2002*, accessed online at <http://ods-dds-ny.un.org/doc/UNDOC/GEN/N02/506/69/PDF/N0250669.pdf?OpenElement>, on May 5, 2003.

Figure 2

### Maternal Mortality Decline by Region, Egypt



**SOURCE:** Egypt Ministry of Health and Population, *National Maternal Mortality Study, 2000*: figure 4.

### Maternal Mortality Decline in Egypt

Maternal mortality appears to have declined significantly, from 174 maternal deaths per 100,000 live births in 1992 to 84 maternal deaths per 100,000 live births in 2000. The current level puts Egypt in about the middle among countries in the region, where estimates for maternal deaths range from 350 deaths per 100,000 live births in Yemen to 3 per 100,000 in the United Arab Emirates (see Figure 1, page 1). This decline is countrywide, but is particularly steep in the Urban Governorates and in Upper Egypt (see Figure 2).

Each year nearly 1.7 million babies are born in Egypt.<sup>5</sup> They and their mothers are much more likely to survive today than before. Childhood mortality has declined by nearly half over the past 20 years, although it still remains high by international standards—about 1 in 22 Egyptian children dies before his or her fifth birthday. In addition,

## Models of Service Delivery in Safe Motherhood Care

A World Bank review of service delivery models in selected developing countries identified four models for delivery care. They range from home delivery by a nonprofessional, such as a relative or a traditional birth attendant, to delivery by a professional skilled attendant in a hospital with comprehensive essential obstetric care (EOC). A hospital with comprehensive EOC should be able to provide Caesarean section deliveries and blood transfusions, in addition to the basic EOC. Basic EOC, normally provided in health centers and small maternity homes, includes administering special drugs and performing lifesaving procedures.

To make motherhood safer, there are a number of required factors in the provision of maternal health services in each model, as presented in the table.

In settings where home delivery is a common practice (models 1 and 2), maternal deaths can be reduced if the health system can provide outreach support to home birth attendants (whether they are trained or not) and establish referral and supervisory links so pregnant women can receive timely emergency obstetric care when they need it. The most effective way to prevent maternal deaths is to have deliveries, whether they take place at home or at a health facility, attended by skilled personnel who can recognize and treat or refer any complications that arise (models 2, 3, and 4). Skilled personnel include health professionals such as physicians, nurses, and midwives, but do not include traditional birth attendants who have not been trained to perform emergency lifesaving medical interventions.

In theory, model 4 should offer the “best and safest” care possible. But in practice that is not always the case. Studies of maternal mortality in Mexico City and Romania, where the majority of

Model	Required factors of services for a safe delivery
Model 1: Delivery by nonprofessional at home	<ul style="list-style-type: none"> <li>■ Appropriate normal birth care</li> <li>■ Nonprofessional recognizes complications</li> <li>■ Access to EOC organized by family or nonprofessional</li> <li>■ Functioning EOC available</li> </ul>
Model 2: Delivery by skilled attendants at home	<ul style="list-style-type: none"> <li>■ Above factors, but substituting skilled birth attendant for nonprofessional</li> </ul>
Model 3: Delivery by skilled attendant in health center (a facility with basic EOC)	<ul style="list-style-type: none"> <li>■ Skilled birth attendant recognizes complications; provides basic EOC in health facility</li> <li>■ Facility organizes access to EOC</li> <li>■ Functioning EOC available</li> </ul>
Model 4: Delivery by skilled attendant in hospital (comprehensive EOC is available)	<ul style="list-style-type: none"> <li>■ Skilled attendant recognizes complications</li> <li>■ Skilled attendant provides basic and comprehensive EOC</li> </ul>

women deliver in hospitals, show maternal mortality ratios of more than 100 deaths per 100,000 live births. The 2000 maternal mortality study in Egypt revealed that the lack of blood at the medical center or hospital contributed to 16 percent of maternal deaths in the country. Although there is not enough evidence to help determine the cost-effectiveness of models 2, 3, or 4, it is certain that model 4 is the most expensive.

**SOURCES:** Elizabeth I. Ransom and Nancy V. Yinger, *Making Motherhood Safer: Overcoming Obstacles on the Pathway to Care* (Washington, DC: Population Reference Bureau, 2002): 14; World Bank, *Reducing Maternal Mortality: Learning from Bolivia, China, Egypt, Honduras, Indonesia, Jamaica, and Zimbabwe* (Washington, DC: World Bank, 2003): 6-37; and Egypt Ministry of Health and Population, *National Maternal Mortality Study, 2000* (Cairo: Ministry of Health and Population, 2000): table 9.

fewer of the babies born to women who die from maternal causes also die, suggesting that newborn care has improved. Between 1992 and 2000, the mortality rate among newborns whose mothers died declined from 57 percent to 50 percent.<sup>6</sup>

Maternal care in Egypt is gradually shifting from home deliveries to institutional deliveries (see Box 2), and the share of deliveries attended by skilled personnel has increased from 35 percent in 1988 to 61 percent in 2000 (see Table 1, page

4), and to 69 percent in 2003. Doctors in Egypt attend about 90 percent of all the births attended by skilled personnel.<sup>7</sup>

Higher contraceptive use and lower fertility (births per woman) have also contributed to the improvements in maternal and child health. Between 1988 and 2003, contraceptive use among married women increased from 38 percent to 60 percent, and fertility declined from 4.4 births to 3.2 births per woman.<sup>8</sup> Since each preg-

Table 1

**Selected Reproductive Health Indicators, Egypt, 2000**

	Urban Governorates	Lower Egypt	Upper Egypt	Frontier Governorates	Total
Maternal mortality ratio (deaths per 100,000 births)	48	93	89	120	84
Percent of births delivered by doctors or trained nurses / midwives	84	65	48	60	61
Percent of births delivered:					
In public health facility	40	18	19	25	22
In private health facility	36	33	15	15	26
At home	23	48	66	60	52
Percent of births whose mothers received any antenatal care during their pregnancy	74	54	44	45	53
Percent of married women using contraception	63	62	45	43	56
Total fertility rate	2.9	3.2	4.2	3.8	3.5

SOURCE: ORC Macro, *Egypt Demographic and Health Survey, 2000*: tables 6.1, 11.5, 11.8, and 11.9.

nancy and delivery carries with it some degree of risk, the decline in fertility lowers women's lifetime risk of dying from maternal causes. However, the decline in fertility alone is not sufficient to explain the magnitude of improvement in maternal mortality in the country.

Despite the increase in contraceptive use, unwanted pregnancies remain a reproductive health challenge. A recent study of obstetric visits to public hospitals highlighted that post-abortion care represents about one-fifth of the caseload in Egyptian facilities, including both spontaneous and induced abortions.<sup>9</sup> Abortion is a safe procedure when performed by qualified doctors in sanitary conditions. However, complications from unsafe abortions—those that are self-induced or carried out by unskilled providers—can lead to disability and even death. Access to safe abortion remains limited in Egypt: Abortions are permitted only in cases where the life of a pregnant woman is endangered.<sup>10</sup>

Despite the large number of doctors and considerable health infrastructure in Egypt, a third of pregnant women in Egypt still go through their pregnancies without any antenatal care. Apparently there has been some improvement in antenatal care since 2000, when nearly half of mothers were going through their pregnancies without any antenatal care.<sup>11</sup> The 2000 maternal mortality study shows that lack of antenatal care contributed to 19

percent of maternal deaths and poor-quality antenatal care contributed to another 15 percent.<sup>12</sup>

With the expansion of the private health sector in the country, an increasing number of deliveries are taking place in private facilities. The 2003 Interim DHS reveals that now 36 percent and 23 percent of deliveries take place in private and government health facilities, respectively; and the remaining 41 percent of deliveries take place at home.<sup>13</sup>

The quality of obstetric care, which was clearly identified as a problem in the 1992 survey, remains low, and unfortunately doctors often are responsible for this low quality. For example, the 2000 maternal mortality survey showed that of the women who died during or after a health-facility delivery, about a quarter died later outside the facility during transportation or at home. This high percentage is alarming and points to problems with referrals and premature discharge.

Nearly all Egyptians live within reach of a health clinic. Roads are generally good and the country's high population density means that women have access to medical facilities in emergencies. Even in rural areas, 99 percent of women live no more than 30 kilometers from a government hospital.<sup>14</sup> Studies show that socioeconomic and cultural factors, rather than physical access, play a role in the underutilization of health care services.

### The Impact of the 1992 Survey

The 1992 maternal health survey identified both unavoidable and avoidable factors contributing to maternal deaths in Egypt, including low-quality obstetric care. In response, the Ministry of Health and Population (MOHP), in collaboration with international partners such as the USAID-funded Healthy Mother/Healthy Child program, implemented by John Snow Inc., designed and implemented a series of activities to improve quality of care. For example, the ministry upgraded maternal and neonatal health facilities and improved the logistics system throughout the country, but with a special focus on Upper Egypt and rural hospitals. The interventions paid special attention to essential obstetric care and the management of obstetric and neonatal emergencies. They included extensive training needs assessments, detailed situational analyses and community diagnoses, and

Table 2

**Single Main Causes of Maternal Death, Egypt, 2000**

Main cause of death	Percent of maternal deaths
<b>Direct obstetric causes</b>	<b>77</b>
Hemorrhage	30
Hypertensive diseases of pregnancy	13
Ruptured uterus	8
Genital sepsis	6
Pulmonary embolism	6
Anesthesia	5
Caesarean section	4
Abortion	3
Other direct cause	2
<b>Indirect obstetric causes</b>	<b>20</b>
Cardiovascular	10
Infectious and parasitic diseases	3
Digestive	3
Other indirect causes	4
<b>Unknown causes</b>	<b>3</b>

**SOURCE:** Egypt Ministry of Health and Population, *National Maternal Mortality Study, 2000*: table 7.

comprehensive interventions to address providers’ technical and communication skills. The ministry also developed national standards for obstetric and neonatal care and revised the medical school curriculum. A *daya* (traditional birth attendant) refresher training manual was developed to improve provider competency. Other activities included the USAID-funded UNICEF Safe Motherhood program, active from 1986 to 2001.

The ministry also carried out mass media campaigns to encourage families to seek medical care and to increase knowledge of danger signs during pregnancy, delivery, and the postpartum period. To increase local involvement, the ministry issued a decree to establish safe-motherhood committees at the central level and in all governorates to coordinate local activities and to play a key role in a future maternal mortality surveillance system.

The 2000 maternal mortality survey points to the success of these efforts. The survey showed a steep decline in maternal mortality throughout the country, but particularly in Upper Egypt. Indeed, the decline in Upper Egypt, one of the country’s poorest regions, is in line with other international

studies that show maternal mortality can be reduced in all socioeconomic settings through investment in the appropriate interventions to ensure essential obstetric care and appropriate management of obstetric emergencies.

**Causes of Maternal Deaths in Egypt**

The 2000 maternal mortality survey shows that about three-fourths of maternal deaths in the country are due to direct medical causes (conditions related to the pregnancy itself). This is generally in line with studies in other developing countries.<sup>15</sup> Hemorrhage, or severe bleeding, was the most significant direct cause, followed by hypertensive disorders, ruptured uterus, infection, and pulmonary embolism. Among indirect causes—conditions aggravated by pregnancy—cardiovascular disease was the most significant (see Table 2).

One purpose of the 1992/93 and 2000 maternal mortality surveys (see Box 3, page 6) was to understand what avoidable factors were contributing to maternal deaths—the 2000 survey showed that only around one-fifth of maternal deaths were considered unavoidable. Researchers collected data by examining the medical records of women who had died from maternal causes, talking to family members about the case, and assessing in detail what led to those deaths. These cases illustrate the complex set of issues that play a role in maternal deaths. A woman’s death might be avoided if she receives sufficient antenatal care to identify potential problems, or if midwives diagnose complications sooner. Women may arrive too late to the district hospital, which may not be equipped to address such cases in a timely manner.

Overall, one or more avoidable factors were associated with 92 percent of maternal deaths recorded in the 1992 survey, compared with 81 percent of maternal deaths in the 2000 survey. Avoidable factors in the studies were categorized as “woman and family factors,” “health facility factors,” and “medical team factors” (see Table 3, page 7). In both surveys, the maternal death audits revealed that substandard care by obstetricians was the largest single factor contributing to maternal mortality, accounting for 47 percent of the avoidable factors in the 1992-93 survey and 43 percent in the 2000 survey. General practitioners contributed to a disproportionate number of deaths in both surveys; while only about 1 percent

### The 2000 Egypt National Maternal Mortality Study

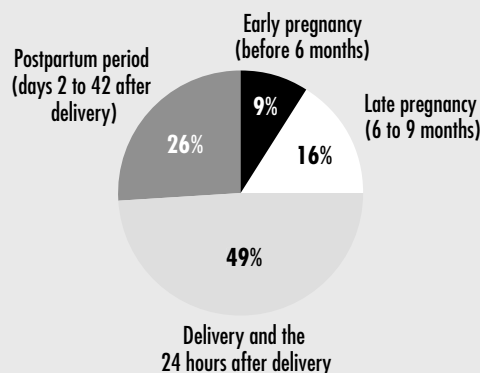
The 2000 National Maternal Mortality Study was conducted by the Directorate of Maternal and Child Health Care of the Ministry of Health and Population, with assistance from the Central Agency for Public Mobilization and Statistics (CAPMAS). The study used a similar research design as the first National Maternal Mortality Study conducted in 1992/93, and the same organizations were involved. The funding for both studies was provided by the United States Agency for International Development (USAID), with technical assistance from John Snow, Inc.

The purpose of the 2000 study was multifaceted: to estimate maternal mortality at the national level, as well as for the regions and for the governorates of Aswan, Luxor, Qena, Beni Suef, Fayum, Kafr El Sheikh, Suez, and the New Valley; to assess changes in maternal deaths since the 1992/93 study; to identify the main medical causes of maternal deaths; and to determine the avoidable factors contributing to maternal deaths. The study also looked at what happened to the infants whose mothers had died.

The survey covered a sample of deaths of women of childbearing age that occurred in all governorates during 2000. The sample was obtained using vital registration data from 149 health bureaus. The selected health bureaus were required to report weekly all deaths of women ages 15 to 49 years that occurred from the first of January to the end of December 2000. Once those who had died from pregnancy-related causes were identified, the researchers reviewed the medical records and interviewed families of those women and any health providers involved. Then, a local advisory group of physicians in each governorate reviewed the records and agreed by consensus on the medical causes of each death and the avoidable factors that contributed to the death.

Confidentiality and a no-blame policy were important parts of the survey design, to ensure that no legal or political actions could be pursued based on the findings. A total of 585 maternal deaths were identified, representing 7 percent of all females of childbearing age whose deaths were recorded. As shown below, about half of the maternal deaths recorded in the study had occurred during delivery or within 24 hours after delivery.

#### Maternal Deaths by Time of Death



SOURCE: Egypt Ministry of Health and Population, *National Maternal Mortality Study, 2000* (Cairo: Ministry of Health and Population, 2000).

of Egyptian women go to a general practitioner for delivery, about 11 percent of the avoidable factors in both surveys were related to substandard care by this group of health care providers.

The 2000 survey also found that often senior, experienced obstetricians were not available to assist the delivering woman, so the management of complications was left in the hands of junior obstetricians. Even more troubling is an increase in the proportion of deaths due to medical interventions, particularly the inappropriate use of oxytocin, a drug that can safely be used to strengthen uterine contractions and shorten delayed labor, but which can be harmful to the mother and her baby when used inappropriately.<sup>16</sup> Recent research indicates that oxytocin is often used inappropriately in normal labor in some Egyptian facilities.<sup>17</sup>

The 2000 survey showed that 93 percent of the women who died from maternal causes had sought medical help at some point. Thirty-nine percent of the women who died, died before delivery. Overall, 62 percent of deaths occurred in health facilities, 9 percent during transportation, and 29 percent at home.<sup>18</sup>

#### Lessons Learned

- A national maternal mortality study that provides an estimate of maternal mortality, information on the main medical causes, and avoidable factors contributing to maternal and infant deaths can be used as an important tool in the management of safe motherhood programs.
- Development, standardization, and dissemination of national clinical protocols are key to improving maternal and neonatal care.
- Staff skills and commodities in supporting departments (emergency room, operating room, anesthesia, lab, central sterilization and supply department, and blood banks) have to be improved with obstetric and neonatal departments to reduce avoidable deaths and complications.
- Clinical training alone does not change provider attitudes and behaviors. Most providers adopt clinical protocols and master skills after on-the-job training with expert clinical supervisors.
- Safe motherhood committees (supported by ministerial decrees) established at all levels can help ensure sustainability of services.
- Investing in the development of a strong national maternal mortality surveillance system can yield timely maternal mortality data.

Table 3

**Avoidable Factors Associated With Mothers' Deaths in Egypt, 1992/93 and 2000**

Avoidable Factors	Percent of maternal deaths associated with each factor <sup>a</sup>	
	1992/93	2000
<b>Woman and family factors</b>		
Delay in recognizing problems/ seeking medical care	42	30
No antenatal care	*	19
Unwanted pregnancy	5	2
<b>Health facility factors</b>		
Lack of blood	6	16
Lack of drugs, supplies, and equipment	2	6
Lack of transportation	4	5
Lack of anesthesia	Not assessed	4
Long distance to hospital	Not assessed	4
<b>Medical team factors</b>		
Substandard care from:		
Obstetrician	47	43
General practitioner	12	11
Daya	12	8
Midwife	Not assessed	4
Poor quality antenatal care	*	15
<b>Total avoidable factor</b>	<b>92</b>	<b>81</b>
<b>No avoidable factor</b>	<b>8</b>	<b>19</b>

\* The categories of “no antenatal care” and “poor quality of antenatal care” were reported together in the 1992 study, which showed that poor quality or no antenatal care was associated with 33 percent of the maternal deaths.

<sup>a</sup> Numbers do not add up to 100 because each death may have more than one factor associated with it.

**SOURCES:** Egypt Ministry of Health and Population, *National Maternal Mortality Study: Findings and Conclusions, 1994*: table 8; and Egypt Ministry of Health and Population, *National Maternal Mortality Study, 2000*: table 9.

■ The success of information, education, and communication (IEC) campaigns relies on the intensive use of mass media along with interpersonal communication and community mobilization activities. In addition, the use of nongovernmental organizations (NGOs) to reach remote areas and deliver MOHP messages can contribute to improved community health behaviors.

**Need for Further Action**

World leaders at the 2000 United Nations Millennium Summit set a goal of reducing maternal deaths by three-fourths between 1990 and 2015.<sup>19</sup> In order to meet this goal, Egypt needs to further reduce its maternal mortality ratio by half—to around 44 maternal deaths per 100,000 live births. While recognizing that this is a substantial challenge, the Egyptian Ministry of Health and Population is eager to maintain the momentum initiated over the last decade. Based on the findings of the 2000 maternal mortality survey, the ministry, in collaboration with the Healthy Mother/Healthy Child Program, is developing a strategy to:

- Expand and strengthen the maternal mortality surveillance system to monitor maternal mortality;
- Expand the availability of quality services by developing obstetric and neonatal care protocols and training providers in their use, together with improving health facilities and equipment availability in all MOHP facilities offering delivery services;
- Expand community-based maternal and child health care services;
- Identify high-risk areas and direct interventions to those areas, including urban slums; and
- Educate communities about health behaviors that contribute to better maternal and child health outcomes.<sup>20</sup>

The support of the international community was crucial to the changes Egypt made to its maternal health care system during the 1990s. Because of the commitment made by the Ministry of Health and Population and international donors to safe motherhood, fewer Egyptian women are dying from avoidable maternal causes. The Egyptian experience shows that the investment of sufficient resources to provide timely obstetric and neonatal care saves women's and newborns' lives. Governments and international donors can draw on the Egyptian example to develop programs to meet the safe motherhood objectives of the Millennium Development Goals.

## PRB's Middle East and North Africa Program

The goal of the Population Reference Bureau's Middle East and North Africa (MENA) Program is to respond to regional needs for timely and objective information and analysis on population, socioeconomic, and reproductive health issues. The program raises awareness of these issues among decisionmakers in the region and in the international community, in hopes of influencing policies and improving the lives of people living in the MENA region.

MENA program activities include producing and disseminating both print and electronic publications on important population, reproductive health, environment, and development topics (many publications are translated into Arabic); working with journalists in the MENA region to enhance their knowledge and coverage of population and development issues; and working with researchers in the MENA region to improve their skills in communicating their research findings to policymakers and the media.

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<sup>6</sup> ORC Macro, *Egypt Interim Demographic and Health Survey (DHS), 2003* (Calverton, MD: ORC Macro, 2004): table 7.1; and Egypt Ministry of Health and Population, *National Maternal Mortality Study, 2000*.

<sup>7</sup> ORC Macro, *Egypt Demographic and Health Survey, 2000* (Calverton, MD: ORC Macro, 2001): figure 11.2; and ORC Macro, *Egypt DHS, 2003*: table 5.8.

<sup>8</sup> ORC Macro, *Egypt DHS, 2003*: tables 2.2 and 3.4.

<sup>9</sup> Dale Huntington et al., "The Postabortion Caseload in Egyptian Hospitals: A Descriptive Study," *International Family Planning Perspectives* 24, no. 1, March 1998: 25-31.

<sup>10</sup> United Nations, *Abortion Policies, A Global Review 1* (New York: United Nations, 2001).

<sup>11</sup> ORC Macro, *Egypt DHS, 2003*: table 5.1.

<sup>12</sup> Egypt Ministry of Health and Population, *National Maternal Mortality Study, 2000*: table 9.

<sup>13</sup> ORC Macro, *Egypt DHS, 2003*: table 5.8.

<sup>14</sup> World Bank, *Reducing Maternal Mortality: Learning from Bolivia, China, Egypt, Honduras, Indonesia, Jamaica, and Zimbabwe* (Washington, DC: World Bank, 2003): 97.

<sup>15</sup> Ann Tinker and Marge Koblinsky with contributions from Patricia Daly et al., *Making Motherhood Safer* (Washington, DC: World Bank Discussion Paper 202, 1993).

<sup>16</sup> Egypt Ministry of Health and Population, *National Maternal Mortality Study, 2000*: 61.

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<sup>20</sup> Esmat Mansour, "Reducing Maternal Mortality in Egypt: Achievements and Challenges," congressional briefing held in Washington, DC, May 27, 2003.

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