



Reducing Maternal Mortality in Morocco: *Sharing Experience and Sustaining Progress*

As a signatory to the Millennium Development Goals (MDGs), Morocco has committed to achieve Goal 5, to reduce maternal mortality by three-fourths between 1990 and 2015. The government has placed high priority on safe motherhood in recent years and has devoted substantial attention and funds in its 2008-2012 national health plan. The Ministry of Health appointed a commission charged with accelerating the reduction of maternal mortality and has undertaken a wide range of measures to improve the functioning of health care systems for obstetric and neonatal emergencies.

The measures taken have been comprehensive and evidence-based: they include investments in health facilities at all levels, supply of essential drugs, the availability and skills of doctors and midwives, and the development of procedures for ensuring quality of care, transferring women, and managing obstetric complications. These measures have been supported by substantially strengthened health information systems.

The adoption of a multisectoral and a whole-of-health-systems approach has been critical to the success of the program. Morocco's maternal mortality ratio is estimated at 112 deaths per 100,000 live births as of 2010¹, which represents a

decline of nearly 60 percent since 1990. Morocco is one of a small group of countries "on track" to achieve MDG 5 by 2015.

This policy brief describes Morocco's experience in terms of actions to accelerate the reduction of maternal mortality. It reviews the development of the maternal mortality strategy, choice of interventions, and the process for implementation and monitoring.

Background

Although there were some efforts to improve maternal and child health since the 1970s, it was not until the 1990s that Moroccan policymakers explicitly tackled high maternal mortality. In 1989-90, a study by the Institut National d'Administration Sanitaire (INAS) (National Institute of Health Management) documented the shortfall in major obstetric interventions², and in 1992, a national survey estimated the number of maternal deaths for the first time³. By 2008, maternal mortality became a top priority in political discourse. Since then, Morocco has undertaken urgent measures to accelerate the reduction of maternal mortality as a priority component of its 2008-2012 health strategy. Table 1 outlines the chronology of initiatives for reducing maternal mortality in Morocco.

1-The estimate is based on the multi-round demographic household survey.

2-Study on the deficits in obstetric intervention, MS, INAS, 1990.

3-322 deaths per 100,000 live births confirmed by the last PAPCHILD survey of 1997, which gives a ratio of 228 per 100,000 live births (rural areas: 307 per 100,000 live births versus 125 in urban areas).



Table 1: History of Maternal Health Policies and Programs

Year	Program	Goals/Strategies
1970	Mother Protection Program	Ministerial decree to provide family planning, antenatal care, and immunization in all health facilities
1974	Child Health Protection Program	Introduction of three antenatal visits and one postnatal visit. The Mother and Child programs were consolidated in 1977.
1987	Monitoring of Pregnancy and Childbirth Program	Focus was on reduction of maternal mortality and morbidity. Set targets to cover antenatal and childbirth in a monitored setting.
1995	Emergency obstetric and neonatal care program (SONU)	Adoption of the three delays model and the launching of emergency obstetric and neonatal care. Improved availability of quality care for obstetric and neonatal emergencies.
2008	Strategy for accelerating reduction of maternal and child mortality (PARMMI)	Aimed to reduce maternal mortality from 227 deaths per 100,000 live births to 50/100,000 and to reduce neonatal mortality from 27/1000 to 15/1000 live births. Key components were improving access, quality of care, and governance.

Regional and Moroccan Trends in Maternal Health and its Determinants

Maternal mortality is highly correlated with levels of fertility and female literacy. Table 2 shows contraceptive use, fertility and literacy in Morocco compared with other countries in the region, using WHO data.

Table 2: Family Planning, Fertility and Literacy, Morocco and Region⁴

Country	Contraceptive prevalence rate (2004-2009) ⁵	Total fertility rate (2009) ⁶	Female literacy rate (2005-2009)
Morocco	63.0	2.2	43.0
Algeria	61.4	2.3	63.9
Egypt	60.3	2.8	57.8
Iran	80.7	1.8	80.7
Jordan	59.3	3.0	87.0
Lebanon	58.0	1.8	n/a
Libya	n/a	2.6	82.0
Mauritania	9.3	4.4	50.3
Saudi Arabia	23.8	3.0	81.1
Tunisia	60.2	1.8	71.0
Yemen	27.7	5.1	44.7

Contraceptive Use and Fertility

Family planning is a key intervention for reducing the fertility and, by extension, the lifetime risk of maternal death. The contraceptive prevalence rate increased from 42 percent to 63 percent between the periods 1995-2002 and 2003-2008.

Demographic surveys show that Morocco's total fertility rate declined from 2.7 births per woman in 1999-2003 to 2.2 in 2009-2010⁷. The urban fertility rate is now at an historic low, below the replacement level, at 1.84 children per woman. While rural fertility, at 2.7, has not yet reached replacement level, the pace of its decline suggests a trend similar to that observed in cities. Indeed, the difference between rural and urban fertility declined from 3.2 births per woman in 1986 to 0.9 births in 2009. Morocco is now in the forefront of Arab countries in terms of its fertility transition⁸.

Girls' Education and Literacy

In literacy, the national average masks differences by sex, age group, and residential area. Women remain less literate than men: 43 percent versus 68 percent in 2007⁹. Education levels have increased substantially during the last decade. The net enrollment rate of children aged 6 to 11 years has increased from 52 percent to 90 percent nationally between 1990 and 2008; it has almost tripled in rural areas and quadrupled among girls in rural areas between 1990 and 2008. As a result, the girl-boy ratio in primary education increased from 66 percent to 89 percent, and the parity index more than doubled in rural areas by 2009.

4-The contraceptive prevalence rate and fertility rate are from WHO's global health database; female literacy rate is from the World Development Indicators database (World Bank).

5-The contraceptive prevalence rate is the percentage of women aged 15 to 49, married or in-union, who are currently using, or whose sexual partner is using, at least one method of contraceptive, regardless of the method used.

6 The total fertility rate is the average number of children a woman would have assuming that current age-specific birth rates remain constant through her childbearing years (ages 15-49).

7- Multi-Round (Repeated) National Demographic Surveys, 2009-2010.

8- HCP Enquête nationale démographique 2009-2010.



Political Context for the Efforts to Reduce Maternal Mortality

Political Commitment

The link between development and the health of mothers has made maternal mortality a key development indicator. The National Initiative for Human Development (INDH), announced by His Majesty the King in May 2005, represented a new approach to development that embraced human development as a key approach for combating poverty and achieving the MDGs¹⁰.

In 2008, the Minister of Health established a permanent, national Commission to Accelerate the Reduction of Maternal Mortality, charged with developing a national action plan and overseeing its implementation. This commission has brought together all stakeholders in the field of maternal health including the academic community, professional associations, managers at different levels, and representatives of UN agencies. This was accompanied by the mobilization of DH 1.4 billion (US\$1 = 8 dh) over five years.

The Commission adopted affordable interventions that had proven effective in similar situations and would have a potentially significant impact on maternal mortality in the medium term (four years). These interventions were adapted to the Moroccan context, in part based on research conducted in the country. The plans generated by the Commission were subsequently submitted to regions and Ministry of Health units for approval and advocacy to mobilize support and funding.

Evidence for Policy

Household surveys such as PAPFAM (similar to the Demographic and Health Surveys) showed that poor and rural populations faced difficulties in geographic and financial access to emergency obstetric care, as indicated by low rates of delivery in facilities and Cesarean sections. The inability to pay was identified as the main obstacle to access to care among 74 percent of women (PAPFAM). Sixty percent of women face problems of physical access / distance to care (PAPFAM), and 46 percent of non-use of maternity wards was due to lack of transport.

A socio-anthropological qualitative study conducted in 2006 revealed that women also face social obstacles to using facilities for delivery. Researchers noted a divergence of perceptions between the population and the medical profession regarding the need for supervised child delivery. The lack of communication and lack of respect, privacy, and a supportive environment for the laboring mother contributed significantly to the reluctance to use these facilities¹¹.

National Strategy to Reduce Maternal Mortality

The Strategic Framework

The Action Plan to Reduce Maternal Mortality—the chief policy document for the maternal mortality strategy—takes a whole-of-health-system approach. It is based on three areas of intervention (pillars), nine levels of action, and 28 main decisions covering the management of delivery through the whole chain of care: transportation from home, care in basic health and maternity facilities, transfer between facilities, as well as all inputs to care including medicines, equipment, and human resources. The three pillars are described below and shown in Figure 1.

Pillar 1 : Reducing barriers to access to emergency obstetric care. This component aims to reduce physical and financial barriers to EmOC and to ensure medical transportation if needed. All possible means should be used to increase the rate of deliveries occurring in health facilities and facilitate the use of a referral system for Cesarean-section births.

Pillar 2 : Improving the quality of care. Quality is assessed and improved through audits and upgrades of all delivery facilities. It is further supported by a quality program begun in maternity hospitals, which introduced a competition in quality of care among hospitals.

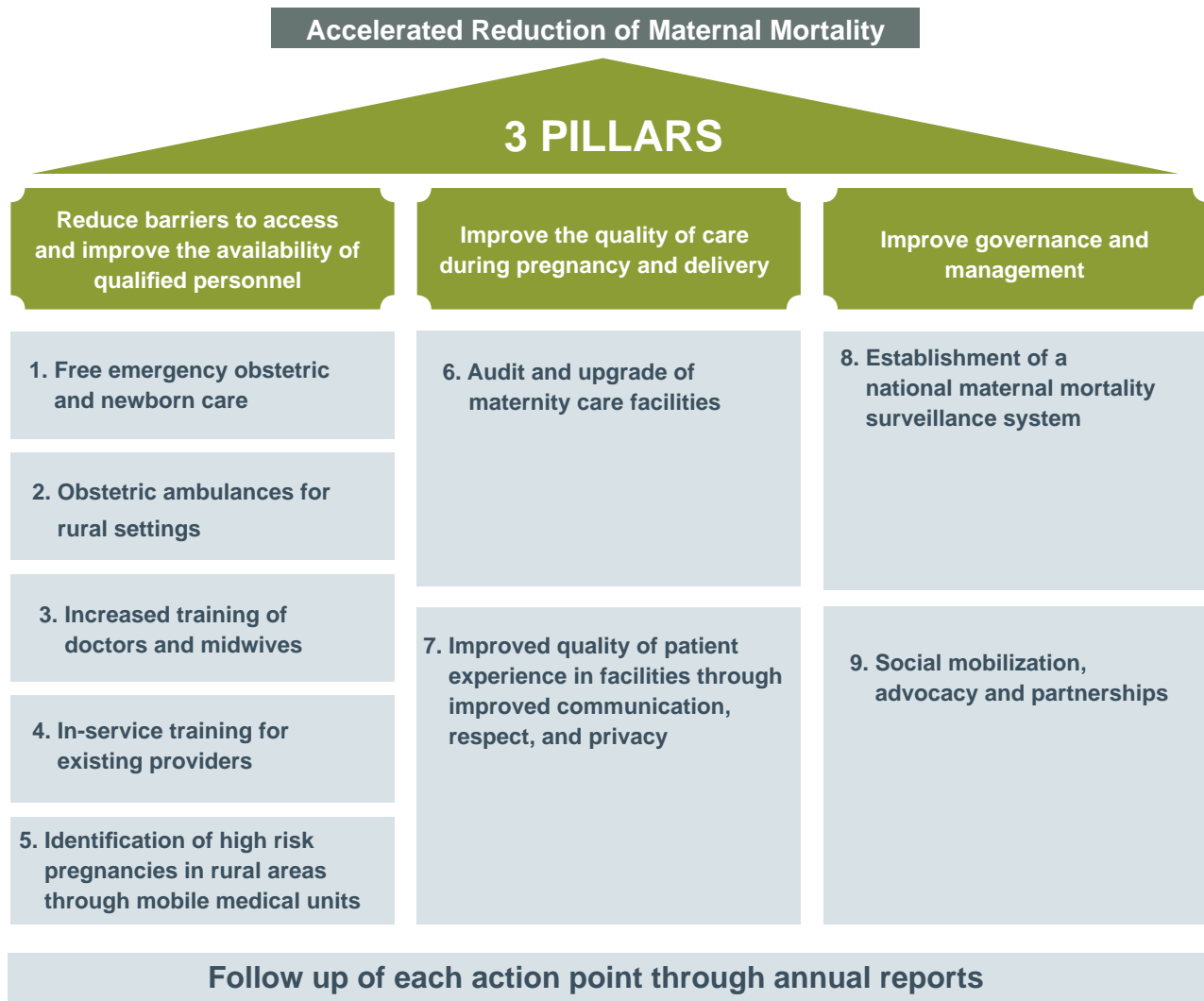
Pillar 3 : Improving governance. Partnerships between a range of health and non-health sector actors involved in implementing the action plan are critical to its success. System management also requires accurate and timely information, achieved by implementing a national maternal mortality surveillance system.

9- Social indicator of Morocco, HCP 2008.

10-Assignment report on Evaluation of Risk Free Maternity, Morocco 25 June-3 August 2002, MS.

11-Socio anthropological study, MS, 2006.

Figure 1. Action Plan to Reduce Maternal Mortality



Key Investments

Infrastructure

An audit of all maternity care facilities (90 maternity hospitals and 518 health centers with maternity units)¹² showed that only 28 percent provided the basic functions of emergency obstetric and neonatal care (EmOC) and 69 percent of hospitals provided comprehensive EmOC. Following the audit, an investment was launched to upgrade the physical equipment of maternity hospitals (estimated at DH 407 million (US\$1=8 dh), or 28 percent of the budget). The goal is to have delivery facilities with norms of care and architectural standards taking into account patient privacy,

respect, and comfort. A working group was tasked with developing a program to improve the physical infrastructure to promote patient privacy and a more patient-friendly delivery environment.

Sixteen maternity hospitals were renovated in 2008. In 2011, the program was expanded to other maternity hospitals and health center maternity units. The renovations of these facilities allowed women to receive 48 hours of post-partum care (which became mandatory) in acceptable living conditions. Facilities added reception and waiting areas, permitted family members to wait onsite, and greatly increased the privacy of delivery rooms.

12- Maternity units within health centers are known as “maisons d’accouchement.” These units consist of 8-10 beds and a delivery block and are managed by two general practitioners and two to three nurses/midwives. Health centers in Morocco provide outpatient care, except for the maternity units that provide inpatient care for women during labor and delivery and for 48 hours post-partum. In general, health centers serve 20,000-30,000 people.



Photo: Delivery Room Renovations to Promote Privacy and Quality of Care

Equipment and drugs

To ensure availability of essential medicines and obstetric supplies (delivery kits, Cesarean-section supplies, and vital medicine), the national Commission for the Reduction of Maternal Mortality conducted an analysis of the Ministry of Health's essential drug list to identify missing items with respect to those recommended by WHO. As a result, prostaglandin was introduced in the Moroccan market, and misoprostol and magnesium sulfate were added to the national list of essential drugs. In addition, all delivery facilities were provided with these drugs and delivery kits based on expected delivery volumes. The type and amount of technical equipment has been codified, and funds have been allocated to facilities for their purchase.

Human resources

To ensure availability of trained health workers, 689 additional midwives were assigned to 167 health center maternity units. The introduction of training courses for midwives in health training institutes and the increase in the number of admissions in the midwifery section contributed greatly to the increase in the number of midwifery students--from 168 in 2007 to 530 in 2010.

For medical specialists, negotiations with faculties of medicine have resulted in increased residency training posts for obstetrician-gynecologists (from 50 to 80) and anesthetists (from 41 to 54). In addition to expanded pre-service education, a number of continuing education activities were introduced for staff involved in the management of pregnancy and childbirth:

- **Annual one-week course on management of labor and delivery complications in hospital maternity benefiting midwives from primary care**

delivery facilities. This training aims to increase the competence of midwives and general practitioners in the management of deliveries and newborn care and provide them with the tools needed to address obstetric complications in areas without access to specialists. This course emphasizes teamwork and collaborative decision-making between midwives and hospital maternity teams.

- **Two visits per year by obstetricians to coach midwives in health center maternity units.** Newly recruited young midwives are often assigned to remote areas where they rarely have access to continuous training to improve their skills. Their isolation and lack of support could be a source of de-motivation and loss of confidence in their abilities.
- **Refresher courses on the new WHO clinical guidelines adapted for Morocco.** Regional refresher courses serve to disseminate new algorithms for the management of hemorrhage and eclampsia and the use of misoprostol and magnesium sulfate in primary care delivery facilities.

Health information: the Maternal Mortality Surveillance System (MMSS)

The maternal mortality surveillance system for maternal deaths was instituted to monitor progress on the Action Plan. The system was rapidly implemented due to political support for data gathering, administrative support, and mobilization of health professionals. Morocco's surveillance system uses a confidential inquiry for all maternal deaths occurring at home and in health care facilities. The implementation of MMSS was divided into three main phases: defining the structure and tools for reporting deaths (e.g., audit questionnaires and verbal autopsy forms); the mandatory reporting of deaths of women aged 15 to 49 in close collaboration with the Ministry of Interior; and introduction of an official investigation for each maternal death.

Within one year after its establishment in 2009, the MMSS enabled the notification of 3,814 deaths of women aged 15 to 49 years, with 436 maternal deaths (64 percent) of expected deaths.¹³ A total of 313 maternal deaths were analyzed by the national expert committee appointed for this purpose. The results of analysis showed that the main causes of death were: hemorrhage (33 percent), pre-eclampsia and eclampsia (18 percent), infection/sepsis (8 percent), and uterine rupture (7 percent). Seventy-six percent of the deaths were judged to have been avoidable. The main determinants of avoidable deaths were delayed access to care (42 percent) and inappropriate treatment (44 percent).

Key Policies

The Commission for the Reduction of Maternal Mortality is also responsible for overseeing key policies introduced as part of the Action Plan. Since the approval of the national strategy, the Commission has focused on the following:

13- Expected deaths in 2009 are : 678

- Launching a program to improve quality in health facilities based on the facility audit. The structures were given two years to upgrade technical and physical facilities. Starting in 2011, the second phase of this program will focus on improving the availability of emergency obstetric care (EmOC). The EmOC standards have been updated and distributed. The target is 80 percent of primary care delivery facilities performing basic EmOC, and 100 percent of maternity hospitals performing comprehensive EmOC.
- The introduction of free delivery, including Cesarean-section delivery. This policy, launched in December 2007, covers all mothers regardless of socioeconomic or insurance status. The directive is displayed at all health facilities, along with announcements in the media and in Parliament. Following the policy change, the government mobilized funds to subsidize the hospitals (calculated on the basis of activities performed). The Ministry of Health, along with other partners, purchased ambulances for the maternity homes in rural areas to provide transportation for parturient mothers (182 ambulances purchased by the Ministry of Health between 2008 and 2010).
- The “quality of maternity hospitals competition.” Launched in 2010, this competition was implemented to evaluate the quality of health facilities and to incentivize local officials and hospital managers to implement best practices in quality improvement. Each year, facilities are assessed on the quality of inputs and clinical care, and the top ten facilities receive awards.
- The development and dissemination of good practice algorithms on postpartum hemorrhage, eclampsia and pre-eclampsia, obstructed labor, and the protocols for using magnesium sulfate. These complications were identified as chief contributors to maternal deaths in the 2009 audit of maternal deaths.
- The codification of procedures regarding transfer and referral processes between facilities, through the development and dissemination of guidance on appropriate levels of care and standard transfer practices.
- Community education, health worker education, and media campaigns to discourage the use of traditional birth attendants.

Implementation of the Action Plan

In Morocco’s decentralized health system, the central Ministry of Health plays a stewardship role and supports the role of regional and local partners by:

- Developing tools, such as certification standards, methodological guidance for surveillance of maternal deaths, verbal autopsy questionnaires, and confidential audits, quality competition manuals, procedures for transfer, and good practice algorithms.
- Supervision, coaching, and addressing problems in the field.

- Involving stakeholders in the system: organization of tours in 16 regions to share the Action Plan directly with the actors involved and to educate health personnel.

The Action Plan also included the establishment of regional committees, each chaired by a regional director, to increase regional responsibility and accountability for managing the safe motherhood program. This multidisciplinary committee was tasked with translating the national plan into regional and provincial plans, ensuring its implementation using five indicators of coverage. The regional committee is in charge of collecting and analyzing surveillance data and writing regional reports on maternal mortality. Regional authorities are also required to develop and implement a regional monitoring program of maternity care facilities.

Beyond the health sector, the Action Plan to Reduce Maternal Mortality has provided an opportunity to strengthen intersectoral collaboration and partnerships with civil society and other actors. Universities and professional medical associations (e.g., obstetrics and anesthesia) have become involved in adapting practice guides and developing algorithms for the management of obstetric complications. They have also helped to standardize practices and give consistent instructions to field staff.

Role of Communities

Ensuring community awareness and participation is a key component of the Action Plan. Community liaison volunteers have played an advocacy role for raising awareness of the need to deliver in the health system and the availability of free, accessible, and high-quality facilities. A system was created to ensure communication and referral in rural and more remote areas between the community liaison volunteers, midwives at birthing homes, ambulances, and hospitals. The system ensures that women with obstetric complications are quickly transferred to the most appropriate facilities for care. The experiment started in 26 birthing homes, covering 1,570 birth cases in the most isolated communities. To date, 818 liaison officers are operational on the ground; they have been trained to detect complicated pregnancies according to the guidelines. Since the launch of the program in late 2010, there have been 6,153 awareness-raising sessions, and 664 cases have been transferred to birthing homes, of which 353 were supported by maternity hospitals.

Role of Partners

UN agencies (UNFPA, UNICEF, UNDP and WHO) have jointly supported the Action Plan to Reduce Maternal Mortality. The goal is to make their actions synergistic and to support the government’s strategies. The European Union, Spanish Agency for International Cooperation and Development, the French Development Agency and UNFPA through a joint program of support to the health system, have also contributed to the reduction of maternal mortality.

Achievements

Service Coverage

The action plan set coverage targets for facility deliveries, focusing on public-sector primary care facilities and hospitals, as well as Cesarean-section births and antenatal care (at least one visit). Table 3 gives the coverage rate achieved by the public sector; private-sector data are not available. The proportion of births attended by skilled personnel rose from 61 percent in 2004 to 71 percent in 2007, and to 83 percent in 2009.

Table 3: Change in Coverage Rates, 2007-2010, Ministry of Health

Coverage indicator	2007	2008	2009	2010	Objective 2012
Antenatal care (at least one visit)	372,706	427,049	429,375 75 %	435,676 70%	500,000 80%
Facility deliveries	385,413	421,000	455,267 75 %	470,309 77%	500,000 90%
Cesarean-section births	37,686	42,481	45,467 7.5%	48,559 10%	45,000 7%

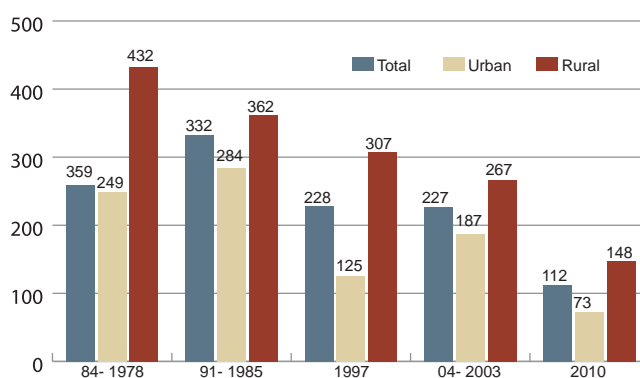
Reduction of Maternal Mortality

All existing maternal mortality estimates for Morocco show a similar trend. According to the 2010 report, Countdown 2015, out of 68 priority countries, 19 countries are "on track" for achieving MDG 5, including Morocco, Brazil, Egypt and China. In the 2010 report by the Institute of Health Metrics and Evaluation (Hogan et al), maternal mortality in Morocco was 124 deaths per 100,000 live births, indicating an annual decline of 6.3 percent between 1990 and 2008. According to the 2010 report of WHO, UNICEF, UNFPA and the World Bank, Trends in Maternal Mortality: 1990 to 2008, the estimated maternal mortality ratio for Morocco is 110 deaths per 100,000 births, i.e., a decline of about 59 percent between 1990 and 2008.

In addition, Morocco's High Planning Commission has conducted a series of national demographic surveys, including a multi-round survey in 2009- 2010 using a large sample of 105,000 households. Three approaches were combined: a retrospective direct estimate of five years, an estimate based on the monitoring of pregnancies during the phases of the survey, and estimates during the third phase using the sisterhood method. The maternal mortality ratio is estimated at 112 deaths per 100 000 live births--148 for rural areas and 73 for urban areas (see Figure 3).

Figure 2: Maternal Mortality by Residence, Morocco, 1978-2010

(Maternal deaths per 100,000 live births)



To put Morocco's progress in context, Table 4 shows maternal mortality trends in the region.

Table 4: Trends in Maternal Mortality in Countries of the Region

Country	1990	2000	2008	Annual % change 1990-2008
Algeria	250	140	120	-4.1
Egypt	220	110	82	-5.5
Bahrain	25	23	19	-1.6
Iran	150	59	30	-8.9
Iraq	93	84	75	-1.2
Jordan	110	79	59	-3.6
Libya	100	74	64	-2.7
Kuwait	10	8	9	-0.4
Lebanon	52	36	26	-3.8
Qatar	15	11	8	-3.4
Saudi Arabia	41	28	24	-3.0
Tunisia	130	83	60	-4.3
Yemen	540	340	210	-5.3
Oman	49	27	20	-5.1
Soudan	830	770	750	-0.5
Syria	120	58	46	-5.2

Source: WHO, UNICEF, UNFPA, and the World Bank, Trends in Maternal mortality: 1990 to 2008 (2010).

Lessons Learned

Morocco's experience suggests that high-level political commitment and concerted health-system actions can dramatically reduce maternal mortality within a decade.

Success Factors

Morocco's progress in reducing maternal mortality has benefitted from:

- Strong political engagement;
- Mobilizing funds to finance free delivery, including Caesarian-section delivery;
- A participatory and multisectoral governing body to oversee strategy and identify priority actions;
- A whole-of-health-system approach that strengthened multiple health-system building blocks and processes;
- Mobilization of professionals and professional organizations to support the strategy;
- Large expansion of pre-service midwifery education and some expansion of medical specialty training;
- Decision-making based on evidence, and involvement of the scientific community;
- Creation of strong links with communities;
- Attention to non-technical quality of care to ensure a positive patient experience in facilities; and
- Implementation of the maternal mortality surveillance system.

Challenges

Expanding the maternal mortality program and sustaining current gains will be challenging, given a range of old and new health priorities in Morocco. Policymakers and health system managers are working to:

- Sustain the plan and continue to mobilize the commitment of the political leadership;
- Sustain high levels of financing as an ongoing expenditure in the health sector;
- Ensure continued provision of material resources to facilities;
- Continue to improve health worker skills to ensure high quality care;

- Create a balance in delivery services between primary health care facilities and maternity hospitals to ensure rational provision of routine and emergency obstetric care;
- Establish a mechanism for ensuring fair assignments of health workers to facilities with high workloads; and
- Increase involvement of the private sector.

Next Steps

Reducing maternal mortality and ensuring equitable access to care requires a long-term, sustained effort. The government and the Ministry of Health are currently in the process of:

- Assessing costs and benefits of the maternal mortality program for the population and the health system;
- Decentralizing the management of the maternal deaths registry, with technical support to regional committees;
- Developing a legally binding framework making quality of care initiatives independent of political changes.

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