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## AVERTING MATERNAL DEATH AND DISABILITY

# Strengthening emergency obstetric care in Nepal: The Women's Right to Life and Health Project (WRLHP)

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### KEYWORDS

Nepal;  
Emergency obstetric care;  
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Utilization

### Abstract

*Introduction:* The Women's Right to Life and Health Project contributes to Nepal's National Safe Motherhood Program and maternal mortality reduction efforts by working to improve the availability, quality and utilization of emergency obstetric care services in public health facilities. *Methods:* The project upgraded 8 existing public health facilities through infrastructure, equipment, training, data collection, policy advocacy, and community information activities. The total cost of the project was approximately US\$1.6 million. *Results:* In 5 years, 3 comprehensive and 4 basic emergency obstetric care (EmOC) facilities were established in an area where adequate EmOC services were previously lacking. From 2000 to 2004, met need for EmOC improved from 1.9 to 16.9%; the proportion of births in EmOC project facilities increased from 3.8 to 8.3%; and the case fatality rate declined from 2.7 to 0.3%. *Discussion:* While the use of maternity services is still low in Nepal, improving availability and quality of EmOC together with community empowerment can increase utilization by women with complications, even in low-resource settings. Partnerships with government and donors were key to the project's success. Similar efforts should be replicated throughout Nepal to expand the availability of essential life-saving services for pregnant women.

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*Abbreviations:* ANM, auxiliary nurse midwife; AHW, auxiliary health worker; DPHO, district public health officer; HA, health assistant; LT, lab technician; NRCS, Nepal Red Cross Society; NGO, non-governmental organization.

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## 1. Introduction and background

Nepal's population of 23 million is predominantly rural – only 14% of the population live in urban areas [1]. One of the most disadvantaged nations in South Asia, 42% of Nepal's population live below the poverty line [2]. Development indicators also fare poorly – infant mortality is estimated at 64 deaths per 1000 live births the contraceptive prevalence rate is 39% and more than 70% of women have no education [1]. In addition, the recent conflict in Nepal has resulted in ongoing violence and civil unrest.

The maternal mortality ratio (MMR) remains high in Nepal and is one of the highest in South Asia. Estimates of MMR range from the Demographic and Health Survey estimate of 549 [3] to the UN estimate of 740 [4] maternal deaths per 100,000 live births. This national estimate masks wide geographical variations since much higher ratios are expected in more remote, mountainous and rural areas. Each year in Nepal, there are roughly 850,000 pregnancies, 130,000 obstetric complications, and 6000 maternal deaths [3–5]. With a total fertility rate of 4.1, a Nepali woman's chances of dying as a result of pregnancy or childbirth over her lifetime is 1 in 24 [1,4]. Direct causes of maternal deaths in Nepal are similar to those elsewhere in the developing world and are largely due to postpartum hemorrhage (46%), obstructed labor (16%), pre-eclampsia/eclampsia (14%), puerperal sepsis (12%), and unsafe abortion (5%) [6].

Critical interventions, specifically, emergency obstetric care (EmOC) and skilled attendance at delivery, are important for reducing maternal mortality and morbidity. Yet only 11% of women deliver with a skilled birth attendant and barely 5% of women with life-threatening complications are able to get EmOC [1,5].

Acknowledging the magnitude of the problem, the Government of Nepal has taken important strides and is committed to the reduction of maternal mortality. Nepal's National Safe Motherhood Program Plan (2002–2017) now works in 13 out of 75 districts, accounting for 20% of the country's total population. UNICEF's Women's Right to Life and Health Project (WRLHP) supports 4 of these 13 districts, while 9 are supported by the Nepal Safer Motherhood Project (NSMP) with funding from the Department for International Development (DFID) [7,8]. These two projects have worked in close partnership to raise the profile of EmOC in the national program as the key intervention for reducing maternal mortality. UNICEF supported the Ministry of Health, Family Health Division (FHD) in implementing the WRLHP, with technical and financial support from the Averting Maternal Death and Disability (AMDD) Program at Columbia University. This paper describes the activities and results of the WRLHP in Nepal from January 2000 through December 2004.

## 2. Methods

The WRLHP was designed to address the 3rd delay in the Three Delays model, i.e., reducing the delay involved in receiving appropriate care at medical facilities [9]. Selection of project districts was made on the basis of low Human Development rankings and a met need for EmOC (the percentage of women with obstetric complications treated in EmOC facilities) [10] below the national average of 5%. Four project districts covering

a population of 1.7 million and having an average met need of 2.3% were selected: Dang, Kapilvastu, Panchthar, and Saptari. In each district, the project aimed to establish comprehensive EmOC in 1 district or zonal hospital, and basic EmOC in 1 Primary Health Care Center (PHCC). Four hospitals and 4 PHCCs were selected for the project. At the baseline assessment, only 1 public facility was providing comprehensive EmOC and 1 public facility was providing basic EmOC. There were no other health facilities providing any services for obstetric emergencies in 3 of the selected project districts. In Dang district, however, there is an Ayurvedic Hospital that claims to provide some EmOC services, but does not report to the government.

### 2.1. Infrastructure improvements

A prerequisite for establishing good quality EmOC is adequate infrastructure. This means facilities should have good sanitation and waste disposal systems, 24-hour water and electricity, and other utilities. An architectural needs assessment was conducted (March to May 2000) to assess the overall infrastructure of the facilities in the selected districts. The needs assessment revealed major shortcomings in hospital buildings. Since cost comparisons between new construction and renovation showed little difference, the project opted for new construction. New maternity units were constructed, including labor and delivery rooms, female wards, and operating theaters in 3 of 4 districts. In the 4th district, new construction was funded by the government. As Nepal is in a seismic zone, new construction necessitated earthquake resistant designs and use of high-quality materials.

Upgrading health facilities to provide EmOC also included preparing equipment lists for each project facility in consultation with hospital managers, healthcare providers, local government, and community members; followed by equipment procurement, distribution, and installation. It took about 3 years to ready project facilities to provide EmOC.

### 2.2. Data collection

A needs assessment was conducted (February to May 2000) to determine the baseline situation in the project districts [5]. Sources of data included hospital registers, monthly reports, project reports, and other records. However, due to poor record keeping, data collected during the needs assessment was found to be weak.

The experience of conducting the needs assessment informed activities to improve monitoring and evaluation and develop a system, based on UN Process Indicators for EmOC [10], for monitoring the project's progress. Hospital staff were trained in recording, reporting, and analyzing EmOC data and indicators. Routine data collection and record keeping on process indicators were done monthly. This led to the standardization and institutionalization of the UN Process indicators. A national data collection and monitoring system was set up at FHD with the technical and financial support of Nepal Safe Motherhood Project (NSMP) and the technical support of WRLHP. A two-day training on monitoring was carried out for a total of 68 doctors, nurses, and facility managers, and changes were made to the Delivery Register and tally sheets that were introduced for monthly data collection and reporting to the FHD and Health Management Information System (HMIS) Section.

### 2.3. Human resources

Attention was paid to staffing, including filling vacancies, training, and team building. It is essential to have adequate staff, particularly staff nurses and doctors with postgraduate training in the district hospital. Poor retention of doctors in the project districts was an ongoing problem during implementation.

Given the paucity of skilled human resources for EmOC and delivery care, the National Safe Motherhood Program used a training strategy that facilitated the delegation of provision of care to the lowest appropriate level at which care could safely be provided. Specialist general practitioner doctors with comprehensive EmOC as well as postgraduate training (MD GP) were designated as the preferred providers of comprehensive EmOC at the district level, specifically for cesarean delivery and other surgical interventions. Since their number is inadequate to fill all rural hospital posts, non-specialists such as junior doctors without postgraduate training but with some additional obstetric training were also permitted to provide these services. The training strategy further delegated responsibility for basic EmOC and postabortion care (PAC) to nurses, as well as anesthetic services to nurses, health assistants, and senior auxiliary health workers (AHWs) who are supervised by senior doctors. Delegation of clinical roles made it possible to increase the availability of human resources with the skills to contribute to greater availability of EmOC.

The WRLHP sponsored several technical training programs to teach EmOC skills to the various cadres of health professionals. Technical training (Table 1) did not start until August 2001 because of difficulty in identifying a hospital available for EmOC training. Local training capacity was increased through a training of trainers in clinical training skills using the competency-based training curriculum for EmOC developed by Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO) and AMDD [11]. A national training site for competency-based training for EmOC was established through an additional grant to the hospital from AMDD and is supported by the WRLHP. External supportive supervision by project team members and the FHD was provided periodically. Training continues as staff are transferred and new staff take up positions in project-supported EmOC facilities.

### 2.4. Improving quality

We addressed management and readiness in project facilities. In particular, the Appreciative Inquiry (AI) approach was adapted by UNICEF's Regional Office for South Asia for use in project hospitals to examine and change attitudes of health workers to improve the

hospital work environment and services to patients. AI is designed to engage all hospital staff – from doctors to gatekeepers and cleaners – as well as Hospital Support Committees and community members in a series of workshops and project planning activities. AI is a non-confrontational, humanistic approach to quality improvement that focuses on successes rather than failures and helps to develop a sense of accountability. It aims for good quality care for the community and for communities supporting facilities to be able to provide needed care [12].

Assessments at a few project facilities found that the AI approach was extremely popular among staff and communities and led to attitude changes that resulted in a series of defined actions to improve the hospital environment and services to patients. The AI approach was critical to improving quality of care by creating a positive environment for change in district health systems through community participation. Involving community representatives in the planning and design of health facilities led to improved staff motivation, a greater commitment to providing quality services, and an increased sense of ownership and public support for the facilities.

AI orientation began in 2001 and AI methods have been incorporated into the twice-yearly review and planning meetings for EmOC at project facilities. Nineteen trainers were trained in the AI method and continue to support these activities.

While the FHD does not have the staff to conduct regular visits, external supervision and support for quality improvement activities were provided occasionally by the FHD and regularly by UNICEF staff.

### 2.5. Policy/advocacy

Policy and advocacy activities proactively facilitated information dissemination, and resource and knowledge exchange at the national and district levels. These activities comprised district and sub-district orientations, advocacy in both local and national newspapers, publication of a WRLHP bulletin, street theater, and radio spots. A major advocacy platform at the district level was through the twice-yearly review and planning meetings with community participation. At the national level, the project worked closely with National Safe Motherhood Program and other partners to raise the profile of EmOC within the national program.

### 2.6. Community activities

While this project focused on the availability and quality of EmOC in existing health facilities, community mobilization

**Table 1** Technical training in 4 WRLHP-supported districts, Nepal (2001 – 2004)

Type of training	Duration	Type of staff trained	No. trained
Competency-based midwifery refresher	30 days	Nurse, ANM	109
Competency-based basic EmOC	6 weeks	Doctor, Nurse	19
Competency-based comprehensive EmOC	17 weeks	Medical Officer	2
Comprehensive EmOC training of trainers	3 weeks	Medical Officer, MDGP	2
Clinical training skills for master trainers	10 days	Doctor, Nurse	15
Postabortion care	8 days	Doctor, Nurse, ANM	12
Operation theater management	6 weeks	Nurse, ANM, AHW	7
Anesthesia assistant	6 months	Nurse, HA, AHW	7
Blood transfusion technician	3 weeks	Lab Technician	4
Infection prevention training of trainers	9 days	Ward In-charge, Nurse, DPHO42	42
Equipment maintenance and users	5 days	Electrician, peon	31

activities were carried out at the same time under the Community Based Safe Motherhood Project (CBSMP) also managed by UNICEF. The CBSMP addresses the first 2 delays in the Three Delays model and used the following strategies to increase demand for and access to EmOC services: (1) empowering women and communities with information on causes of maternal deaths, danger signs, and birth preparedness; (2) establishing revolving funds for travel to EmOC facilities and EmOC treatment; (3) developing emergency transport mechanisms (ambulance, stretchers) and referral systems; and (4) training auxiliary nurse–midwives (ANMs) to provide delivery services and obstetric first aid [13] at the community level, and to refer women with complications to EmOC facilities. Village Development Committees (VDC) in the project districts, which represent the local government at village level, are responsible for managing the revolving funds, including recovery of funds borrowed.

Community mobilization was done in all 4 districts. This included a week-long orientation on Safe Motherhood for 105 district health staff, members of the district and VDCs, teachers, and non-governmental organization (NGO) staff. Thirteen people from the Nepal Red Cross Society and NGOs, as well as lab technicians, were trained as motivators for blood donation. Interviews in the 4 districts affirm that community awareness-raising activities are seen as having increased the use of services.

### 3. Project resources

#### 3.1. Partnerships

At the central level, the National Safe Motherhood Program in Nepal is coordinated by the FHD within the Ministry of Health (MOH). Various complementary projects supported by partners in the program are implemented. In addition to the project described here the Maternal and Neonatal Health Program supported by USAID mainly addressed policy issues such as a national training strategy and a communications strategy; birth preparedness package and advocacy messages for increasing utilization of maternal health services; and training sites for EmOC. The Nepal Safer Motherhood project is supported by DFID and has been described elsewhere [7,8].

#### 3.2. Financial resources

The total cost of the project was US \$1.6 million, of which AMDD contributed US \$1.1 million and DFID \$300,000. Table 2 shows project expenditures by source and activity. As mentioned above, construction of one of the facilities was funded by the Government of Nepal and is not included in this accounting.

Community and hospital contributions were also made during the course of the project. The Panchthar Taxi Association provided a 50% discount for EmOC patients to facilitate referrals and access to facilities. A blood donor club was established. Community financing in the form of revolving funds were set up to increase access to EmOC by women with complications.

### 4. Results

Data for the UN Process Indicators on availability, utilization, and quality of EmOC [10,14] were collected and calculated for 2000–2004 and are described below. The 2000 data are baseline figures; most interventions were put into place in mid- to late-2002; and almost all systems were functioning by 2003.

#### 4.1. Availability

The UN Process Indicators recommend at least 1 comprehensive and 4 basic EmOC facilities per 500,000 population. The facilities should be geographically distributed so as to provide equitable access to all women. Thus, this population of 1.7 million requires a minimum of 4 Comprehensive EmOCs (CEmOC) and 14 Basic EmOC (BEmOC) facilities well-distributed across the 4 districts. At baseline, only one of the facilities was providing CEmOC and 1 was providing BEmOC. The project planned to ensure the availability of the 4 CEmOC facilities needed and 4 of the 14 BEmOC facilities. Establishing more than 4 BEmOC facilities was beyond our resources.

By December 2004, 3 facilities were functioning as CEmOC facilities and 4 as BEmOC facilities (Table 3). The 4th district hospital targeted for CEmOC is still providing only BEmOC as the doctor trained and posted to this facility left and was not replaced in this period. One of the PHCCs targeted for BEmOC remained non-EmOC throughout the project as an EmOC trained nurse was never posted to the facility.

**Table 2** Project expenditure by category, in 4 WRLHP-supported districts, Nepal (December 1999 – April 2004)

Expenditure category	Amount contributed by AMDD in US \$	Total amount spent by project in US \$	% of total amount spent
Needs assessment	21,339	21,339	1.3
Construction	291,300	291,350	18.0
Equipment and supplies	212,092	260,833	16.1
Technical training	117,941	205,660	12.7
Management training	88,136	97,170	6.0
Planning, monitoring, supervision for quality of care	144,205	174,290	10.7
Policy advocacy	21,715	21,715	1.3
Community activities, IEC, advocacy	0	341,845	21.1
Project support	188,293	207,810	12.8
Total	1,085,021	1,622,012	100

**Table 3** Emergency obstetric care availability, utilization and quality in 4 districts of Nepal (2000 – 2004)

	Baseline (2000)	2001	2002	2003	2004
Project area population information					
Population <sup>a</sup>	1,709,239	1,751,165	1,794,126	1,838,148	1,865,007
Expected births <sup>b</sup>	52,160	53,243	54,393	55,569	55,950
Expected complications <sup>c</sup>	7824	7986	8159	8335	8392
Project health facilities					
Comprehensive EmOC	1	1	2	3	3
Basic EmOC	1	1	4	4	4
Non-EmOC	6	6	2	1	1
Total EmOC facilities	2	2	6	7	7
Data from project facilities					
Number of births	1971	2376	3379	4215	4623
Number of complications treated	148	456	866	1517	1421
Number of cesareans	230	187	219	324	377
Number of direct maternal deaths	4	10	1	6	4
Percent of births in facilities (%)	3.8	4.5	6.2	7.6	8.3
Met need (%)	1.9	5.7	10.6	18.2	16.9
Cesarean deliveries as a proportion of all births (%)	0.4	0.4	0.4	0.6	0.7
Case fatality rate	2.7	2.2	0.1	0.4	0.3

<sup>a</sup> Based on population projections of the Central Bureau of Statistics in Nepal using 2001 census data and the natural growth rate.

<sup>b</sup> Based on district-level crude birth rates for each year, from the Central Bureau of Statistics: 34.2 (2000), 33.3 (2001), 32.6 (2002), 31.9 (2003), and 31.3 (2004).

<sup>c</sup> Based on estimate that 15% of deliveries will develop life-threatening maternal complications [10].

## 4.2. Utilization

Data on utilization of EmOC in the 4 districts are shown in Table 3. The UN recommends that at least 15% of all births in the population take place at EmOC facilities. While the proportion of births in EmOC facilities more than doubled in five years from 3.8% in 2000 to 8.3% in 2004, it remains well below the recommended minimum of 15%.

More to the point, to reduce maternal deaths, women with complications must get the medical care they require. This is assessed by met need for EmOC – defined as the percentage of all women expected to have major obstetric complications who are treated at EmOC facilities. At baseline in 2000, the average met need in EmOC project facilities was only 1.9% (148 women with complications treated), and by the end of 2004, met need increased to 16.9% (1421 women with complications treated); yet more than 80% did not seek care. Cesarean deliveries as a proportion of all births also increased from 0.4% (230 cesarean deliveries) in 2000 to 0.7% (377 cesarean deliveries) in 2004. Both indicators, however, remain far below the recommended levels.

## 4.3. Quality of care

The quality of EmOC also showed improvement as reflected in the case fatality rate (CFR), which decreased from 2.7% in 2000 to 0.3% in 2004, with a marked decline between 2001 and 2002 (Table 3) and surpasses the UN recommended level. CFR measures the percentage of women admitted with complications who die and is a rough measure of facility performance, particularly in the quality and promptness of care. This decrease in obstetric CFR took place in spite of the increase in the number of women with

obstetric complications managed at EmOC project facilities (Table 3).

## 4.4. Policy change

The NSMP and WRLHP partnership with FHD, was successful in raising the profile of EmOC as the core intervention for saving women's lives and bringing about several important changes in policy:

- A 15-year National Safe Motherhood Plan was finalized in 2001 and prioritized EmOC as a key component in maternal mortality reduction.
- The government institutionalized at the national level the UN Process Indicators for monitoring EmOC services. Plans are underway to incorporate the new monitoring systems into the HMIS at its next revision.
- Human resources policy changes have included the delegation of responsibility for provision of anesthesia to nurses working under the supervision of a doctor; delegation of responsibility for provision of basic EmOC and postabortion care services to nurses; and ANMs and nurses are now allowed to give oxytocin, anticonvulsants, and antibiotics for obstetric first aid.

## 4.5. Replication and standardization

At the review of the national program, the FHD adopted as the national standard the technology package for addressing delays in care at facilities which emphasizes capacity to manage and treat obstetric complications (developed by the NSMP and WRLHP and implemented by the partners and FHD). FHD also adopted the community elements for

reducing the 1st and 2nd delays, including mapping of VDC origin of women with obstetric complications and community financing from the Community-Based Safe Motherhood Project (CBSMP).

## 5. Discussion

The WRLHP has shown that even in low-resource settings with very low rates of facility deliveries, increases in the availability, quality, and utilization of emergency obstetric care can be achieved. Moreover, these achievements took place over a relatively short period of time – 4 years – and during a period of conflict and political instability. The Maoist insurgency, which began in 1996, and the state of emergency imposed by the government in response, has affected all districts including the project areas. Insecurity and evening curfews make travel dangerous, especially at night and even in obstetric emergencies. Placing and retaining staff in conflict-affected areas was difficult, as was following up with EmOC trainees.

There is no doubt that investments in health facility infrastructure, human resources, and quality of care are important steps in the pursuit of reduced maternal death and disability. However, to achieve this end, the country's National Safe Motherhood Program must be scaled up to cover all districts and reach vulnerable and marginalized communities. Currently, the program works in only 13 out of 75 districts and covers 20% of the population. There is still a long way to go in increasing met need for EmOC even in the 4 project districts discussed here as well as throughout Nepal.

Advocacy is still needed to increase support from doctors for the expanded role of nurses in PAC and BEmOC. It is also essential to include skills for BEmOC in the pre-service training of doctors during medical school. PAC and BEmOC training should also be incorporated into the curriculum for a proposed new cadre of midwives.

Partnerships have played a critical role in the WRLHP's achievements and are crucial for reducing maternal mortality. During project implementation, for example, collaborative activities, particularly with the NSMP, included advocacy with the government for filling hospital vacancies, finalizing EmOC indicators to be used within the National Safe Motherhood Program, and helping institutionalize the UN Process Indicators in the national program's monitoring systems. Joint programming among donor agencies and other organizations (e.g., professional associations, teaching institutions) is valuable for identifying areas of cooperation, minimizing duplication of efforts, and maximizing outputs while working in a challenging, resource constrained environment.

The Department of Health Services Nepal (DHS) has also been proactive in expanding EmOC to Sub-Health Post level through advocacy for upgraded infrastructure of 250 Sub-Health Posts (staffed by one maternal and one child health worker) at the village level, to increase access to facility-based delivery care during 2005. Recognizing the need for skilled attendance closer to the community and linked to EmOC referral sites, the DHS began a policy of upgrading 3949 Maternal and Child Health Workers (with a basic training of 15 weeks) by training them in midwifery skills for 24 months. After training, these health workers will be able to manage, stabilize and refer life threatening complications.

High-level political commitment is imperative for reducing maternal mortality. Achieving progress requires determined leaders within the medical community, and among decision-makers and politicians. In particular, strong government commitment is fundamental to ensuring a health systems approach to reducing maternal mortality, which increases access to and availability of good quality EmOC. This commitment entails a focus on an appropriate human resources development policy, strengthening decentralization of health services delivery including supervision capacity, government allocation of funds for Safe Motherhood, and sustaining long-term funding from donor agencies.

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