EMERGENCY OBSTETRIC CARE AVAILABILITY, ACCESSIBILITY AND UTILIZATION IN EIGHT DISTRICTS IN PAKISTAN'S NORTH WEST FRONTIER PROVINCE

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Introduction: Reducing maternal mortality is a critical issue in Pakistan. Do public health care centers in Pakistan's North West Frontier Province (NWFP) comply with minimum UN recommendations for availability, use, and quality of basic and comprehensive Emergency Obstetric Care (EmOC) as measured by UN process indicators? **Methods:** All public health facilities providing EmOC (n=50) in 30% of districts in NWFP province (n=8 districts) sampled randomly in September 2003 were included in a cross-sectional study. Data came from health facility records. **Results:** Almost all indicators were below minimum recommended UN levels. The number of facilities providing basic EmOC services was much too low to be called providing comprehensive coverage. A low percentage of births took place in hospital and few women with complications reached EmOC facilities. Caesarean section was either underutilized or unavailable. The case fatality rate was low, perhaps due to poor record-keeping. **Conclusion**: The findings of this first needs assessment in NWFP province can serve as a benchmark for monitoring future progress. In resource-poor countries like Pakistan, it is important to upgrade existing facilities, giving special emphasis to facilities that provide basic EmOC services, since many problems can be resolved at the most basic level. Health policy makers and planners need to take immediate, appropriate rectifying measures to, inter alia, improve staffing in rural areas, enhance staff skills through training, upgrade management and supervision, ensure medical supply availability, mandate proper record-keeping, and observe progress by monitoring process indicators regularly.

Key Words: EmOC services, Process indicators, Mental Mortality, Public Hospital, Pakistan.

INTRODUCTION

The burden of maternal mortality and morbidity is especially high in Asia and the Near East[1]. Every year some 529,000 women die due to pregnancy-related complications[2, 3]. Despite increased attention in the last decade to this "neglected tragedy," much can still be done to ensure that women have safe and healthy pregnancies and to reduce maternal mortality in the poorest countries. In Africa, Asia, Latin America, and the Caribbean, where 99% of maternal deaths occur, too many women are dying during labor and delivery because they lack timely access to quality health care.

Enabling women to reach a hospital in time to save their lives is a major focus of efforts to reduce maternal mortality. Once complications in pregnancy become apparent, the mother's course, which may lead to her death and the death of her infant, is determined by the barriers which may prevent a woman in labor from receiving the care that might save her life. The "three-delay" model[4] explains how risks increase first with delay in the recognition of warning signs and in the decision to seek care. A second delay is caused by barriers of distance and transportation, i.e., the time needed to arrive at the appropriate facility, which is a function of distance and availability of transportation. A third delay may occur in receiving care at the facility. Hence the role of hospitals cannot be ignored.

While maternal mortality has many causes and both direct and indirect determinants, it is well known that most deaths can be prevented if adequate and timely emergency obstetric care is provided[4]. The WHO safe motherhood program in 1987, has emphasized the importance of access to emergency obstetric care (EmOC) to manage the common causes of obstetric death: hemorrhage, obstructed labor, complications due to unsafe abortion, eclampsia, and infection[5,6]. These life-threatening complications of pregnancy are generally not preventable or predictable, but if nothing is done to avert maternal death, natural mortality is around 1000 to 1500 per 100,000 births -- unacceptably and avoidably high[7].

To address this issue, a set of process indicators was formally issued by UNICEF, WHO, and UNFPA in 1997[8]. They have been used in research surveys and to assess services available at selected hospitals[9]. They are useful in determining the availability, use, and to some extent, the quality of EmOC. They are also useful for monitoring changes in availability, utilization, and quality.

Pakistan has a high maternal mortality ratio of 500 per 100,000 live births[10], which translates into deaths of more than 16,500 women in Pakistan every year from pregnancy and childbirth-related causes[11].

A society's male-to-female ratio is used frequently as an indicator of gender inequality, because it reflects gender differentials in mortality. Pakistan is one of the few countries in the world where men outnumber women. According to the 1998 census, the sex ratio (the ratio of men to women in the population) was 108 males per 100 females[12]. This disproportion is attributable to premature deaths of girls and women, especially during childbearing. Their deaths may in turn be attributable to poor access to health inputs for women or to social factors resulting in sheer neglect.

These considerations underscore the importance of ensuring that all pregnant women receive adequate antenatal care during pregnancy and that deliveries take place under the supervision of trained medical personnel in a hygienic environment. The purpose of this study was to ascertain if public health care centers in Pakistan's NWFP province comply with minimum UN recommendations for emergency obstetric care and whether differences in EmOC availability, use, and quality exist between these districts.

MATERIALS AND METHOD

This report looks at a study carried out to collect information at the health facility level using UN process indicators, which are increasingly recognized as tools to identify the availability, use, and quality of emergency obstetric care[8].

Study site

For the purposes of the study, we selected Pakistan's North West Frontier Province (NWFP), which is located on both banks of the Indus river and stretches from the Himalayas in the north to deserts in the south bordering Baluchistan and Punjab provinces. It covers an area of 74,521 square kilometers. According to the 1998 census, the total population of NWFP was approximately 17 million, of whom 52% are males and 48% females. The population density is 238 per square kilometer[13].

Eight of NWFP's twenty-four districts were randomly selected; their combined population was 7,186,453, with a population density of 460 persons per square kilometer. The average literacy rate was 37% (female literacy 19%); the districts[1] average per capita income was US$1627 (Table 1). The urban population was 14%, with an unemployment rate of 29%. Access to TV, radio, and newspapers was, respectively, 44%, 43%, and 23%. Fifty-seven percent had access to water in their homes; 38% had running water (pipe water). Electricity was accessible to 85% of the population[14].

Sampling procedure

In Pakistan, provinces are further divided for administrative purposes into districts. Depending on population size, each district has four or more rural health centers, providing basic EmOC services[8] (i.e. parenteral antibiotics, oxytocin, and anticonvulsants, manual removal of placenta, retained products of placenta, and assisted vaginal delivery) and one district and 2 to 3 Tehsil hospitals, which provide comprehensive EmOC[8] (including basic EmOC, plus caesarean section and blood transfusion).

To minimize bias, random sampling was done at both the area and the health-facility levels. For better evaluation in the first stage of sampling, 30% of districts in NWFP province (n=8 districts) were randomly selected[1]; in the second stage, all public health facilities providing EmOC in the selected districts were included (n=50). The information in the hospital records was checked for reliability and validity by repeating data collection from a 10% sample of hospitals.

A team comprising four experienced data collectors undertook the study; all were trained by the chief investigator. The data sources were health facility records, including the labor and birth registry, the operating theater registry, the antenatal registry, and the gynecological ward registry.

Data collection took place from July to September 2003. The records reflect 12 months of facility data. The crude birth rate used to calculate the expected number of births was 27/1000 population. Though the needs assessment was conducted mainly using pre-established tools, a few questions were added. Permission was obtained from the ethics review committee at the University of Tokyo, Japan, and from the NWFP Ministry of Health in Pakistan. Data processing and analysis were carried out using SPSS version 10 (SPPS Inc., Chicago, IL, USA) to produce simple frequencies and percentages.

RESULTS

Availability of EmOC

According to UN recommendations, there should be at least one comprehensive and four basic EmOC facilities per 500,000 population. To meet the UN's minimum standards for the population of the selected districts in NWFP, 60 basic and 15 comprehensive facilities providing EmOC would be required.

Our research found that in NWFP only 6 (or 10% of recommended) health facilities provided the recommended basic EmOC services. No single district had the recommended minimum basic EmOC facilities. Similarly, in NWFP only 6 health facilities (40% of the recommendation) provided comprehensive EmOC.

Table-1: NWFP: Sampled district Indicators

District	District Per capita Income (US$)	Male to Female Ratio	Literacy (%)	Female Literacy (%)
Karak	953	96.0	41.9	18.1
Charsadda	1974	108.0	31.1	14.1
Swabi	2046	101.0	36.0	18.3
Kohat	2141	101.1	44.1	23.5
Bannu	1399	106.9	32.1	12.2
Lower Dir	438	98.3	29.9	12.3
Haripur	3000	99.7	53.7	37.4
Swat	1062	106.3	28.8	13.5

Source: NIPS 2002

Table-2: Availability of EmOC, NWFP Pakistan (Indicator 1)

Population size	Current availability	Recommended number: 4 per 500,000 population	Current availability	Recommended number: 1 per 500,000 population
	Basic	Basic	Comprehensive	Comprehensive
NWFP All selected districts combined (*Population:7186453)*	0.41 [6]	(60)	0.41 [6]	(15)
Karak	2.32	(4)	0.00	(1)
Charsadda	0.49	(8)	0.49	(2)
Swabi	0.49	(8)	0.49	(2)
Kohat	0.00	(5)	0.88	(1)
Bannu	0.00	(6)	0.74	(1)
Lower Dir	0.00	(11)	0.39	(3)
Haripur	0.59	(7)	0.00	(2)
Swat	0.37	(11)	0.37	(3)

[ ] shows actual number of functional facilities; ( ) In parentheses the expected number of functional health facilities are given.

Table 3. Proportion of births in EmOC facilities, NWFP, Pakistan (Indicator 2)

	Number of deliveries	Expected number of births	Proportion	Recommended
NWFP All selected districts combined (*Population:7186453)*	47246	196189	24.08%	
Karak	1826	11760	15.52%	
Charsadda	3864	27911	13.84%	
Swabi	3070	28031	10.95%	> 15 %
Kohat	9774	15360	63.63%	
Bannu	4945	18446	26.80%	
Lower Dir	12209	35053	3.45%	
Haripur	1468	23205	6.32%	
Swat	10090	36423	27.70%	

Table-4: Met need in EmOC facilities, NWFP, Pakistan (Indicator 3)

	Number of women with complications treated	Expected number of complications in population	Met needs	Recommended
NWFP All selected districts combined (*Population:7186453)*	7230	29428	24.6%	
Karak	466	1764	26.4%	
Charsadda	817	4186	19.5%	
Swabi	1177	4205	28.0%	100%
Kohat	408	2304	17.7%	
Bannu	1872	2767	67.7%	
Lower Dir	336	5258	6.40%	
Haripur	179	3481	5.10%	
Swat	1975	5463	36.1%	

Table 5. Caesarean deliveries as a proportion of all births, NWFP, Pakistan (Indicator 4)

	Number of Caesareans	Expected number of births	Proportion	Recommended range
NWFP All selected districts combined (*Population:7186453)*	1773	196189	0.89%	5-15%
Karak	0	11760	0.00%	
Charsadda	42	27911	0.15%	
Swabi	79	28031	0.28%	
Kohat	404	15360	2.70%	
Bannu	696	18446	3.77%	
Lower Dir	93	35053	0.26%	
Haripur	0	23205	0.00%	
Swat	449	36423	1.23%	

Table 6. Case fatality rate, NWFP, Pakistan (Indicator 5)

	Number of maternal deaths/ complications	Case fatality rate	Recommended maximum
NWFP All selected districts combined (*Population:7186453)*	56 / 7064	0.79%	1%
Karak	0/466	0.00%	
Charsadda	0/817	0.00%	
Swabi	0/1177	0.00%	
Kohat	00/408	0.00%	
Bannu	21/1872	1.12%	
Lower Dir	0/336	0.00%	
Haripur	0/179	0.00%	
Swat	35/1809	1.93%	

The combined data for all districts in NWFP province show that its indicators were 0.41 basic EmOC and 0.41 comprehensive EmOC facilities for 500,000 population, far below the minimums (4 and 1, respectively) recommended by the UN (Table 2).

As for access to health facilities, it was found that in NWFP the median time required to reach a referral hospital providing comprehensive EmOC from a hospital providing only basic EmOC was 45 minutes (q1-q3: 20-60 minutes). It was noted that 56% of hospitals in NWFP had either non-functional ambulances for patient transportation or none at all.

Proportions of births in EmOC facilities

According to UN minimum recommendations and based on the assumption that at least 15% of pregnant women in a given population will develop complications and require access to EmOC, at least 15% of all births should occur in health facilities.

If fewer than 15% of all births take place in health facilities providing EmOC facilities that means that women in need of services are not receiving them. The study findings showed that 24% of all births in the districts studied occurred in health facilities, but the gap between districts was wide: in Lower Dir, the proportion of births in EmOC facilities was 3.45%, while in Kohat, the proportion was 63.3%, better than the recommended percentage (Table 3). We conjecture that this disparity is due to social and cultural restrictions that induce women in some areas to give birth at home.

Met needs in EmOC facilities

All pregnant women with complications (the minimum recommendation is 100%) should have access to and be treated at health facilities providing EmOC. The numerator of met need is the number of women with major obstetric complications who were in fact treated in EmOC facilities; the denominator is an estimate of the number of women expected to have a serious complication, i.e. 15% of the number of births in the population.

Met need in all the selected districts taken together was 24.6%, meaning that three out of four women who might have had a life-threatening obstetric emergency did not receive treatment in an EmOC facility.

Similarly to the findings regarding the percentage of births in health care facilities, a wide gap was observed between the districts: met need was 5.1% in Haripur and 6.4% in Lower Dir and much better in Swat (36%) and Bannu (68%) (Table 4).

Caesarean deliveries as a proportion of all births

To save endangered women's lives, it is crucial that they have access to such life-saving procedures as caesarean section. UN process indicators recommend that at least 5% of births be undertaken by caesarean section and, keeping in mind the overuse of this technique, no more than 15%.

It was found that caesarean section was performed in only 0.89% of all births in the NWFP districts studied. The rates ranged from 0%, to 3.8% in Bannu district.

The reported 0.89% figure for deliveries by caesarean is far below the UN guidelines' minimum recommended percentage, suggesting that many women with obstructed labor and eclampsia requiring caesareans do not receive this life-saving intervention (Table 5).

Case fatality rate

This indicator, a measure of the quality of services provided by health facilities, estimates the number of women who come to the facility with complications from which they die. The case fatality rate for all districts in the NWFP province considered together was 0.79%; except for Bannu (1.12%) and Swat (1.93%), other districts had no deaths on record (Table 6). Besides the two districts mentioned, each district's level was lower than the recommended maximum (1%), but this "success" is due perhaps to poor record keeping.

We found that hospitals keeping adequate records had case fatality rates above 1%. For example, case fatality rates at district hospitals in Swat, and Bannu, were higher than the recommended maximum. The survey found that many hospitals supposedly providing EmOC did not keep standardized records: in NWFP 2% of hospitals have no record books for maternal health and obstetric services, although 92% of hospitals visited had a labor/birth registry, and 26% had an antenatal registry. These figures demonstrate the need not only for improved hospital information systems but also for uniform record-keeping systems.

DISCUSSION

Maternal mortality in developing countries is a major tragedy of inequity and social injustice. From the time of the first national health policy in 1990, Pakistan has seen many transformations regarding health legislation, policy, and services.

Despite all the governments' promises and efforts to widen health coverage and develop an efficient and effective health care system, such important indicators as maternal mortality and infant mortality remain consistently higher than in other countries with equivalent income levels.

The first step in improving national maternity health care is to identify the most pressing issues requiring immediate attention. This paper focuses on assessing the current status of EmOC services in NWFP province. The EmOC indicators clearly point to the third delay (occurring after the patient has arrived at a health care facility equipped to perform the required functions) as the prime target of improvements in the availability, access, use, and quality of EmOC services. Analysis of these indicators provides useful keys to problems requiring attention if maternal mortality reduction is to progress.

Almost all indicators were found to be below minimum recommended UN levels. Studies in other countries have found that comprehensive EmOC facilities, but not basic EmOC facilities, tend to be numerically adequate in relation to population[15,16,17]. Our study's findings concur. This study found that both basic and comprehensive EmOC facilities fall short of UN minimum recommendations, and basic facilities much more so: 6 basic EmOC facilities instead of the 60 recommended, and 6 comprehensive EmOC facilities instead of the 15 recommended; no district met the minimum recommended levels. Given the huge gap between existing and recommended levels, a resource-poor country such as Pakistan should direct efforts at increasing access to basic EmOC facilities and at upgrading existing basic EmOC facilities, because many obstetric complications can be resolved at the basic EmOC level.

Giving birth at home is strongly preferred in Pakistan, and it is often the only option for many women in the developing world. A large proportion of home births take place without skilled attendants. When the need arises for EmOC services and women cannot or do not seek those services or identify warning signs, the consequences can be tragic. This study found that rates of hospital birth were low and few women with complications reached facilities. The findings also show that only 24% of births take place in facilities providing EmOC: in other words, it is likely that many women who need treatment are not coming to the hospital. Although some districts were meeting recommended levels of hospital births, half fell short. Birth attendants must be educated about warning signs of problems in childbirth, so pregnant women can get timely and appropriate attention. In all districts considered together, the met need was only 24.6%. Therefore it is estimated that at the provincial level, over 75% of women experiencing obstetric complications may not be receiving life-saving care.

Caesarean delivery, one of the comprehensive EmOC functions in the arsenal of life-saving procedures potentially available in Pakistan, is either unavailable or far underutilized.

Caesarean section is performed in far less than 5% of births in all the areas studied, and none at all in a few. The small proportions of births by caesarean section in all the districts hint again that many women are not receiving the emergency care they need.

In all the districts studied, the case fatality rate was 0.8%, which seems low, but as stated in the results, we found that it was perhaps due to poor record keeping. Hospitals that do keep records have case fatality rates greater than 1%, suggesting a need for quality improvement in record keeping.

This study helped focus attention on the problems of maternal mortality much more effectively than traditional rate and ratio statistics. The survey identified some of the problems in data collection and interpretation especially where necessary data were missing. It also clearly identified the districts where EmOC services should be improved on a priority basis. The first possible step towards rectifying the problem is to improve the record-keeping system so that quality information is available for proper interpretation of the data to make informed decisions.

The application of existing technology can greatly reduce the number of maternal deaths. Hence policy makers need to emphasize and facilitate efforts to improve maternal health by applying existing technology. The challenge is to ensure the availability 24/7 of basic and comprehensive EmOC services geographically distributed to maximize access for the greatest number of women, especially in rural areas. This can begin by improving staffing, enhancing skills through training, improving management and supervision, ensuring availability of supplies, and keeping proper records.

The regular monitoring of the process indicators used in this study should be made part of the routine procedure and protocol for observing change and taking appropriate rectifying actions.

Finally, steps must be taken to develop the people's confidence in the quality of available services and through community education to create awareness of obstetric complications and maternal and perinatal morbidity and mortality issues.

The findings from this first study in NWFP province in Pakistan should be taken as a benchmark for setting future priorities in near-term efforts to reduce maternal morbidity and mortality.

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