



Averting maternal death and disability
Program note

Using UN process indicators to assess needs
in emergency obstetric services: Pakistan,
Peru and Vietnam

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This is the third Program note in a series that features the UN process indicators for monitoring obstetric services [1,2]. Issued by UNICEF, WHO and UNFPA, they are used to identify the availability, use, and, to some extent, quality of emergency obstetric care (EmOC) [3]. They are also useful at monitoring changes in these three important aspects of health care. The definitions are summarized in Table 1 and recommended levels can be found in the results tables.

The UN indicators developed from an understanding that certain medical services or procedures are necessary to save the lives of women with obstetric complications. These procedures or ‘signal functions’ distinguish facilities that provide basic or comprehensive emergency obstetric care from those that do not.

If a facility has provided the first six functions in the past 3 months, it provides basic EmOC and if it has provided all eight of the functions, it qualifies as comprehensive:

- parenteral antibiotics;
- parenteral oxytocic drugs;
- parenteral anticonvulsants for pregnancy-induced-hypertension;

- manual removal of placenta;
- removal of retained products (e.g. vacuum aspiration);
- assisted vaginal delivery (e.g. vacuum extraction, forceps);
- surgery (e.g. cesarean delivery); and
- blood transfusion.

The following brief reports present the data from the Needs Assessments in Pakistan, Peru and Vietnam undertaken in 2000. Each case reflects 12 months of facility data. A needs assessment was the first step in carrying out the Averting Maternal Death and Disability (AMDD) Program in participating countries. In the case of Pakistan and Peru, the Program has been implemented in a subset of the surveyed facilities. In Vietnam the Needs Assessment focused exclusively on the five facilities selected for interventions.

1. Results from Pakistan 2000 [4]

In the Needs Assessment, 70 governmental facilities were surveyed in three districts of the Province of Sindh (Sanghar, Hyderabad and Karachi West). It was conducted by the Department of Health of the Government of Sindh and UNICEF between February and April of 2000; service statistics reflect patient activity between January and

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Table 1
Definitions

Process indicator	Definition
Availability of EmOC	Number of facilities that provide EmOC per 500 000 population
Proportion of all births in EmOC facilities	Proportion of all births in EmOC facilities
Met need	Proportion of women with obstetric complications treated at EmOC facilities
Cesarean deliveries as a proportion of all births	Cesarean deliveries as a proportion of all births
Case fatality rate	Proportion of women with obstetric complications admitted to a facility who die

December of 1999. The 1998 population census estimate of the three districts was 6 450 439 inhabitants with a crude birth rate of 30 per 1000 population.

1.1. Availability of EmOC

For the three districts with a combined population of this size, 52 basic and 13 comprehensive EmOC facilities are the minimum recommended number of facilities (one comprehensive and four basic facilities for every 500 000 population). Overall 13 facilities provide the full range of comprehensive functions, but availability varies from Karachi West, where only half of the recommended facilities can be found for the population size, to Hyderabad, which exceeds the minimum by two comprehensive facilities (Table 2). Basic facilities fall short of the number recommended, especially in Karachi West.

It should be noted that the survey did not include hundreds of private hospitals, maternity homes and smaller clinics, especially numerous in Karachi, some of which provide comprehensive EmOC services. However, these facilities are not accessi-

ble to much of the population for economic reasons.

1.2. Proportion of births in EmOC public sector facilities

The UN indicator specifies ‘births in EmOC facilities,’ i.e. those facilities that can treat most if not all obstetric emergencies. An estimated 15% of pregnant women develop obstetric complications that require medical care, therefore, the recommendation that at least 15% of births deliver in EmOC facilities [3]. Fewer than 15% of births occur in the public health facilities surveyed, ranging from almost 12% in Hyderabad to 4% in Karachi West (Table 3).

1.3. Met need

The numerator of met need is comprised of the major obstetric complications that are treated in EmOC facilities, i.e. those complications leading to the direct causes of death. The denominator is an estimate of the number of women expected to have a serious complication, i.e. 15% of the

Table 2
Availability of EmOC

District	Population size	Baseline availability		Recommended number	
		Basic	Comprehensive	Basic	Comprehensive
All three districts	6 450 439	16	13	52	13
Karachi West	2 105 923	2	2	17	4
Sanghar	1 453 028	6	3	12	3
Hyderabad	2 891 488	8	8	23	6

Table 3
Proportion of births

District	Number of births	Expected number of births	Proportion (%)	Recommended (%)
All three districts	15 368	193 513	7.9	> 15
Karachi West	2500	63 178	4.0	> 15
Sanghar	2781	43 590	6.4	> 15
Hyderabad	10 087	86 745	11.6	> 15

Table 4
Met need

Districts	Number of women with complications treated	Expected number of complications in population ^a	Met need (%)	Recommended (%)
Karachi West	Not available			100
Sanghar ^b	190	1533	12.4	100
Hyderabad ^b	120	1082	11.1	100

^a Population refers to the sub-district catchment area of each hospital.

^b Data are not from the Needs Assessment but from one hospital in each district in 2000.

Table 5
Cesarean deliveries

District	Number of cesareans	Expected number of births	Proportion (%)	Recommended range (%)
All three districts	1976	193 513	1.0	5–15
Karachi West	204	63 178	0.3	5–15
Sanghar	50	43 590	0.1	5–15
Hyderabad	1722	86 745	2.0	5–15

expected number of births in the population [3]. According to this definition, 12% of the women in need of treatment in the district of Sanghar and 11% of the women in Hyderabad received treatment (Table 4).

1.4. Cesarean deliveries in public sector facilities as a proportion of all births

One percent of all births in the total population are delivered by cesarean in the public sector facilities surveyed; as many as 2% of the births in Hyderabad are cesareans (Table 5). Because cesareans performed at private facilities have not been counted, this proportion is likely to underestimate the true proportion. It is also likely that many women who would benefit from surgical deliveries

are not receiving this potentially life-saving intervention.

1.5. Case fatality rate for hospitals surveyed

The case fatality rate at each of the two facilities that reported maternal deaths and complications is below the recommended maximum of 1% (Table 6). This may reflect either good provider practices, low utilization of services or problems with the registration of deaths and complications, or some combination of these explanations.

2. Results from Peru 2000 [5]

The Needs Assessment for Peru covered all major facilities in the six most northern provinces

Table 6
Case fatality rates

District	Number of maternal deaths/complications	Case fatality rate (%)	Recommended maximum (%)
Karachi West ^a	5/Not available	Not available	1%
Sanghar ^a	1/190	0.5	1%
Hyderabad ^a	0/120	0	1%

^a Data are not from the Needs Assessment but from one hospital in each district in 2000.

Table 7
Availability of EmOC

Population size	Baseline availability		Recommended number	
	Basic – 1	Comprehensive – 1	Basic	Comprehensive
413 494	0	2	3	1

Table 8
Proportion of births

Type of facility	Number of births	Expected number of births	Proportion (%)	Recommended (%)
Two EmOC facilities	2572	9924	25.9	> 15
All facilities surveyed	5418	9924	54.6	> 15

of the department of Ayacucho. The six provinces have a population of approximately 413 500. In 2000 the crude birth rate for this largely rural department was 24 births per 1000 population. The survey was conducted in May and June of 2000 by the Regional Directorate of Health and the FEMME (Foundations to Enhance the Management of Maternal Emergencies) Project at CARE in Ayacucho; the service statistics reflect patients who presented between May 1999 and April 2000. A total of 31 facilities were surveyed, including five that are not part of the Ministry of Health network. Five facilities are hospitals.

2.1. Availability of EmOC

One of the six signal functions for a basic EmOC facility is assisted vaginal delivery. In Peru, the use of forceps or vacuum extraction is uncommon and is no longer part of the pre-service training curriculum at some of the country's leading medical schools. Thus, we have used the designa-

tion of Basic – 1 or Comprehensive – 1 to reflect the absence of assisted vaginal delivery.

According to the UN recommended ratio of one comprehensive facility per 500 000 population, pregnant women of northern Ayacucho have more than adequate access to comprehensive EmOC, but the region falls short of having three basic facilities (Table 7). The two comprehensive facilities are only 1 h apart by vehicle; thus, the upgrading of three facilities to a basic level of care should improve the geographical distribution of EmOC.

2.2. Proportion of births in EmOC facilities

One in four births takes place in the two facilities that provide comprehensive emergency obstetric care, but more than half of the deliveries take place in institutions that provide some, if not all, life-saving procedures (Table 8).

2.3. Met need

Met need is relatively high in Ayacucho; almost one in four women estimated to have severe obstet-

Table 9
Met need

Type of facility	Number of women with complications treated	Expected number of complications in population	Met need (%)	Recommended (%)
Two EmOC facilities	340	1489	22.8	100
All facilities surveyed	560	1489	37.6	100

Table 10
Cesarean deliveries

Type of facility	Number of cesareans	Expected number of births	Proportion (%)	Recommended range (%)
Two EmOC facilities	468	9924	4.7	5–15
All facilities surveyed	491	9924	4.9	5–15

Table 11
Case fatality rates

Type of facility	No. of maternal deaths/ complications	Case fatality rate (%)	Recommended maximum (%)
Two EmOC facilities	4/340	1.2	1
All five hospitals	8/386	2.1	1
Health centers and other clinics	9/182	4.9	1

ric complications receives care at an EmOC facility; overall, 38% receive some care (Table 9). These figures do not include women treated for abortion complications. Traditionally the numerator should include women with complicated abortions, generally defined by hemorrhage or sepsis [3]. If all women receiving an intervention (aspiration or curettage) are included, with no distinction made according to severity, met need increases to 53% at EmOC facilities and 82% at all facilities (data not shown).

2.4. Cesarean deliveries as a proportion of all births

The cesarean rate almost meets the minimum level recommended of 5% of all births (Table 10). In several facilities an occasional cesarean is performed, although these facilities do not consistently perform all functions to qualify as an EmOC facility.

2.5. Case fatality rates for hospitals and other facilities

The aggregate case fatality rate at the two comprehensive EmOC facilities is just above the recommended maximum of 1% (Table 11). However, rates are higher if a distinction is made between hospitals and health centers. There are hazards in aggregating facilities that do not have the same capacity to resolve emergencies, and in this case, not all hospitals perform surgery. But where surgery is available, the case fatality rate is the lowest.

3. Results from Vietnam, 2000 [6]

The Needs Assessment in Vietnam surveyed only five facilities, those targeted for interventions to reduce maternal mortality. These major hospitals are located in the Province of Thanh Hoa in the north-central part of the country and in the centrally located Quang Tri Province. The facilities

Table 12
Availability of EmOC

Province	Population size	Baseline status of five facilities		Recommended number	
		Basic	Comprehensive	Basic	Comprehensive
Thanh Hoa	3 467 600	0	2	28	7
Quang Tri	573 331	1	2	5	1

Table 13
Proportion of births

Province	Number of births	Expected number of births	Proportion (%)	Recommended (%)
Thanh Hoa	2502	55 482	4.5	> 15
Quang Tri	1930	11 510	16.8	> 15

Table 14
Met need

Province	Number of women with complications treated	Expected number of complications in population	Met need (%)	Recommended (%)
Thanh Hoa	242	8322	2.9	100
Quang Tri	452	1726	26.2	100

Table 15
Cesarean deliveries

Province	Number of cesareans	Expected number of births	Proportion (%)	Recommended range (%)
Thanh Hoa	700	55 482	1.3	5–15
Quang Tri	440	11 510	3.8	5–15

Table 16
Case fatality rates

Province & Hospital	No. of maternal deaths/complications	Case fatality rate (%)	Recommended maximum (%)
Thanh Hoa Provincial Hospital	4/210	1.9	1
Hoang Hoa District Hospital	0/32	0	1
Quang Tri Provincial Hospital	0/332	0	1
Hai Lang District Hospital	1/29	3.4	1
Trieu Hai Area Hospital	2/91	2.2	1

included two provincial level hospitals, one area hospital and two district hospitals. The two provinces have a combined population of four million inhabitants. The crude birth rate used to calculate

the expected number of births was approximately 20 per 1000 population in Quang Tri Province and 16 in Thanh Hoa. The Needs Assessment was conducted by Save the Children in August of 2000,

but the data reflect service statistics from January to December of 1999.

3.1. Availability of EmOC and status of the five facilities surveyed

If the five facilities surveyed were the only ones providing emergency obstetric care, pregnant women in these two provinces would be seriously underserved. According to other sources, however, Thanh Hoa has a total of 19 basic and nine comprehensive facilities [7]. Although 19 falls short of the 28 recommended for the size of the population, availability of services is far better than the assessment suggests (Table 12). Quang Tri Province appears to have greater availability of EmOC services than Thanh Hoa; of the three facilities surveyed two provide comprehensive care and one provides basic care. Again, additional sources indicate that Quang Tri Province has six basic and four comprehensive facilities, more than the recommended minimum number of EmOC services.

3.2. Proportion of births in five surveyed EmOC facilities

In Quang Tri 17% of births occur in the three EmOC facilities surveyed; as many as 70% may take place in facilities of all levels, ranging from the provincial hospital to the 117 communal health stations. In Thanh Hoa institutional births may be equally high, however, approximately 4% of all births are delivered at the two EmOC facilities included in the survey (Table 13).

3.3. Met need at five surveyed EmOC facilities

The two comprehensive facilities in Thanh Hoa Province attend 3% of the met need in the Province. In Quang Tri, at least 26% of the women with obstetric emergencies are receiving care at the three EmOC facilities surveyed (Table 14). Since not all EmOC facilities were assessed, met need has been underestimated.

3.4. Cesarean deliveries at five surveyed EmOC facilities as a proportion of all births

The two comprehensive facilities in Thanh Hoa Province deliver at least 1% of all expected births

in the Province by cesarean, falling short of the recommended lower level of 5% (Table 15). The two comprehensive facilities in Quang Tri deliver by cesarean almost 4% of the Province's expected births. Like the other indicators, provincial estimates are underestimated because not all EmOC facilities were surveyed.

3.5. Case fatality rates for five surveyed hospitals

In three of the five facilities, the case fatality rate exceeds the recommended maximum of 1%; it ranges from zero to a high of 3.4% at the district hospital in Hai Lang (Table 16).

4. Conclusions

As with the previous Program notes [1,2], we have seen a tendency in each country towards an adequate number of comprehensive facilities but a shortage in the number of basic EmOC facilities. This may reflect the newness of the concept of basic emergency care and the planning within the health system that has not yet prioritized these services. Training staff to carry out the procedures and maintaining a constant supply of emergency drugs and functioning equipment may also require more attention. The disproportionately low number of basic facilities also may reflect patterns of low utilization of health centers in favor of more sophisticated hospitals for giving birth.

In Pakistan, the group of indicators suggests disparities in access and utilization of emergency obstetric care across districts. Proportionately Karachi West has fewer EmOC facilities in the public sector than the other two districts and consequently presents a very low level of births attended in these EmOC facilities. This district has a high number of private facilities, but their service statistics are not publicly available. Hyderabad has the highest proportion of births in EmOC facilities and also the highest cesarean delivery rate, but met need in this district is low, which may be a function of poor record-keeping. Major obstetric complications were infrequently registered prior to the Needs Assessment and the project interventions; thus, met need and the case fatality rates were not

calculated from the same baseline data as the other baseline indicators.

Pregnant women in Ayacucho, Peru, have a large number of facilities available to them compared with some regions of the world. Peru also stands out by having relatively high estimates for the proportion of births in EmOC facilities, met need and cesarean delivery. The calculation of met need in Peru presents an interesting insight into how obstetric services are being used and for what kinds of complications. Met need more than doubled when abortion-related complications were included in the calculation. However, the facilities in Peru did not distinguish between abortion cases that are routinely treated with curettage or manual vacuum aspiration and those cases that are life-threatening. Since the other two countries in this Program note did not collect information on all abortion cases, we cannot make a cross-country comparison of how the incidence of abortion affects met need. But the high abortion caseload in Peru surely accompanies a high cost for women and for the health system.

Where access to cesarean delivery is relatively good, as in the case of Ayacucho, some obstetric complications that could be resolved with assisted vaginal delivery are likely to pass straight to surgery, especially if few health care professionals are trained to perform vacuum extraction or to use forceps. However, in the most inaccessible rural areas, having midlevel personnel trained to do assisted vaginal delivery would allow women to deliver safely, closer to home and without the risk of surgery and anesthesia.

The results from Pakistan and Vietnam highlight the difficulties of presenting provincial or population level indicators when data are collected at a limited number of facilities. When only a few institutions collect data we can only monitor the contribution of those facilities to the indicators. In the case of Vietnam, we know that the two provincial hospitals are the highest level of care available and that they receive referrals with the most serious obstetric complications. If the other district level EmOC facilities in these provinces that were not

surveyed are providing similar levels of care as those surveyed, accessibility and utilization of emergency obstetric care appear to have reached reasonable levels. The case fatality rates, however, suggest a need for further investigation—are women arriving very late or is the attention they receive poor? These particular data will be their most useful as a baseline against which to document changes at the institutional level.

The process indicators will be calculated periodically to monitor the progress of program efforts towards improving access to, utilization of and quality of emergency obstetric services.

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