



Averting maternal death and disability
Program note
Using UN process indicators to assess needs
in emergency obstetric services:
Bhutan, Cameroon and Rajasthan, India[☆]

AMDD Working Group on Indicators^{*}

Family Health International, Research Triangle Park, NC, USA

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This is the second program note in a series that features the UN process indicators [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). They are also useful at monitoring changes in these three important aspects of health care. The definitions and recommended levels of the indicators are summarized in Table 1.

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 (EmOC) 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 Bhutan, Cameroon and Rajasthan, India, undertaken in 2000 and 2001. In each case, they reflect 12 months of hospital data. A needs assessment was the first step in carrying out the Averting Maternal Death and Disability project in these three countries.

[☆] AMDD Working Group on Indicators. Participants of AMDD Working Group on Indicators: Bhutan: D. Wangmo, K.C. Buragohain, G.P. Dhakal, N. Dorji; Cameroon: S. Maiga Konate, A. Traore, A. Gueye; Rajasthan: V. Srinivasan, H. Dwivedi, H. Vidhani; AMDD: P. Bailey, A. Paxton, D. Maine.

^{*} Corresponding author. P.E. Bailey. Tel.: +1-919-544-7040.
E-mail address: pbailey@fhi.org (P.E. Bailey).

Table 1
Process indicators

Indicator	Definition	Numerator	Denominator	Recommended level
Availability of EmOC	No. of facilities that provide EmOC per 500,000 population	No. of facilities that provide basic/comprehensive EmOC	500,000 population	1 comprehensive/500,000 4 basic/500,000
Proportion of all births in EmOC facilities	Proportion of all births in EmOC facilities	No. of births delivered in EmOC facilities in time period	Estimated no. of births in area in same time period	> 15%
Met need	Proportion of women with obstetric complications delivered at EmOC facilities	No. of women with obstetric complications delivered in EmOC facilities in time period	Estimated no. of women with obstetric complications	100%
Cesarean deliveries as a proportion of all births	Cesarean deliveries as a proportion of all births	No. of cesareans in time period	Estimated no. of births	5–15%
Case fatality rate	Proportion of women with obstetric complications admitted to a facility who die	No. of deaths in facility due to specific complications during time period	No. of women treated for specific complications in facility in time period	< 1%

1. Results from Bhutan 2000 [3]

The Needs Assessment of district hospitals in the country of Bhutan was conducted by the Department of Health Services within the Ministry of Health and Education in February and March of 2000. In 2000, the Bhutanese population estimate was approximately 658 000 inhabitants with a crude birth rate of approximately 36 per 1000 population.

The Needs Assessment team visited all 31 health facilities in which a medical officer was

posted. This included six grade 1 basic health units, 19 district and sub-district level hospitals, three regional referral hospitals and three army hospitals. Only 29 of 31 facilities admitted obstetric patients.

1.1. Availability of EmOC

For its population size, Bhutan should have at least five Basic and one Comprehensive EmOC facilities (Table 2). Four facilities provide Basic EmOC, or 80% of the recommended number,

Table 2
Availability of EmOC

Population size	Baseline availability		Recommended number	
	Basic	Comprehensive	Basic	Comprehensive
657 548	4 (80%)	4 (400%)	5	1 +

Table 3
Proportion of births in EmOC facilities

Facility type	Number of births	Expected number of births	Proportion	Recommended
Eight EmOC facilities	2647	23 672	11.2%	> 15%
All facilities surveyed	3502	23 672	14.8%	

and four facilities provide the full range of Comprehensive signal functions, or 400% of the recommended number. The Comprehensive EmOC facilities are well distributed geographically, but the Basic facilities are concentrated in the western and south-western regions of the country.

The UN indicator or ratio of Basic and Comprehensive EmOC facilities per population is a minimum standard. Since the country has nearly met or exceeded this minimum in the case of Comprehensive facilities, the health system is moving forward towards achieving a larger ratio of one Comprehensive facility for a population smaller than 200 000. The additional coverage in EmOC is important given the problems of access to facilities that women face in this mountainous country.

1.2. Proportion of births in EmOC facilities

The UN indicator specifies ‘births in EmOC’ facilities, those that can treat most 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 (Table 3) [1]. Almost 15% of births occurred in all of the facilities surveyed, but not all of these facilities provide all of the signal functions, therefore further improvement is needed.

1.3. Met need

Met need is based on the major obstetric complications, those that are considered the direct causes of death [1]. Using this definition, 19% of the women who experience severe complications in pregnancy, delivery or the postpartum period are being treated (Table 4).

1.4. Cesarean deliveries as a proportion of all births

Slightly more than one percent of all births in the population are by cesarean (Table 5); many

Table 4
Met need

Facilities	Number of women with complications treated	Expected number of complications in population	Met need	Recommended
All facilities surveyed	674	3551	19.0%	100%

Table 5
Cesarean deliveries

Number of cesareans	Expected number of births	Proportion	Recommended range
307	23 672	1.3%	5–15%

Table 6
Fatality rate

Number of maternal deaths/complications	Case fatality rate	Recommended maximum
10/674	1.5%	1%

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 for the facilities studied is a little higher than the recommended maximum of 1% (Table 6). Furthermore, only six of the 29 hospitals with obstetric admissions reported a maternal death. If only those six hospitals are considered, the case fatality rate increases to 10% (10/100).

2. Results from Cameroon 2001 [4]

The Needs Assessment for Cameroon covered five of the country's 10 provinces. The five

Table 7
Availability of EmOC

Province	Population size	Baseline availability		Recommended number	
		Basic	Comprehensive	Basic	Comprehensive
All five provinces	7 481 920	2 (3%)	20 (133%)	60	15
Center	2 154 094	0	4 (100%)	17	4
East	692 183	0	1 (100%)	6	1
Extreme north	2 533 953	2 (10%)	7 (140%)	20	5
North	1 604 000	0	3 (100%)	13	3
South	497 920	0	5 (500%)	4	1

Table 8
Proportion of births in EmOC facilities

Region	Number of births	Expected number of births	Proportion	Recommended
22 EmOC facilities	19 172	323 376	5.9%	> 15%
Center	7175	91 549	7.8%	
East	464	29 833	1.6%	
Extreme north	6516	106 173	6.1%	
North	2862	76 511	3.7%	
South	2155	19 310	11.2%	

provinces have a population of 7 481 920 or approximately half of the country's total population. The crude birth rate varied across regions but was approximately 42 births per 1000 population. The Needs Assessment was conducted by the Ministry of Health and UNFPA in March and April of 2001. Of a total of 783 facilities, 487 were surveyed.

2.1. Availability of EmOC

The ratio of Comprehensive EmOC facilities to a population of 500 000 equals or exceeds that which is recommended in every province, but Basic EmOC facilities are very few (Table 7). The ratio of services to population is particularly favorable in the southern province. Many facilities that potentially could offer Basic services lack supplies, equipment or human resources.

2.2. Proportion of births in EmOC facilities

Overall, almost 6% of all births took place in the facilities visited, far fewer than the 15% estimate of pregnant women who may require medi-

Table 9
Met need

Region	Number of women with complications treated	Expected number of complications in population	Met need	Recommended
22 EmOC facilities	3116	48 506	6.4%	100%
All facilities surveyed	4057	48 506	8.4%	

cal attention during pregnancy, delivery or postpartum (Table 8).

2.3. Met need

Met need in Cameroon is low; fewer than one in 10 women with severe obstetric complications receives care (Table 9).

2.4. Cesarean deliveries as a proportion of all births

The cesarean rate is less than 1%, falling short of the 5–15% range recommended (Table 10).

Table 10
Cesarean deliveries

Province	Number of cesareans	Expected number of births	Proportion	Recommended range
All facilities surveyed	676	323 376	0.2%	5–15%
Center	400	91 549	0.4%	
East	24	29 833	0.1%	
Extreme north	124	106 173	0.1%	
North	47	76 511	0.1%	
South	81	19 310	0.4%	

Table 11
Fatality rate

Province	Number of maternal deaths/complications	Case fatality rate	Recommended maximum
20 Comprehensive facilities	87/1 502	5.8%	1%
Center	10/338	3.0%	
East	0/55	0	
Extreme north	40/553	7.1%	
North	35/135	25.9%	
South	2/421	0.5%	

2.5. Case fatality rate for hospitals reporting maternal deaths

The aggregated case fatality rates in these Comprehensive facilities are high (Table 11). Among those that registered at least one death, the lowest rate is in the Southern province where coverage of EmOC facilities is highest.

3. Results from Rajasthan, India, 2000 [5]

The Needs Assessment in Rajasthan, India,

Table 12
Availability of EmOC

District	Population size	Baseline availability		Recommended number	
		Basic	Comprehensive	Basic	Comprehensive
All seven districts	13 050 000	39 (37%)	8 (31%)	104	26
Udaipur	2 150 000 ^a	4 (23%)	0	17	4
Sawai	1 120 000	6 (67%)	1 (50%)	9	2
Madopur					
Bhilwara	1 980 000	9 (56%)	1 (25%)	16	4
Alwar	2 880 000	7 (30%)	1 (17%)	23	6
Bharatpur	2 060 000	7 (44%)	1 (25%)	16	4
Chittorgarh	1 780 000	4 (28%)	2 (50%)	14	4
Karauli	1 080 000	2 (22%)	1 (50%)	9	2

^aA teaching hospital in Udaipur provides Comprehensive EmOC but is not one of the project hospitals, hence its catchment population and service statistics are excluded.

covered seven of the state's 31 districts. The seven districts have a population of approximately 13 million inhabitants or approximately one-quarter of the state's population (53.9 million in 2000). The crude birth rate used to calculate the expected number of births was 31 per 1000 population. The Needs Assessment was conducted by UNFPA and the Government of Rajasthan between June and September of 2000. A total of 82 facilities were surveyed.

3.1. Availability of EmOC

Given the size of the population, Rajasthan has only approximately one-third of the Comprehensive or Basic EmOC facilities that are recommended. The district of Sawai Madopur has bet-

ter availability of EmOC services than other districts. While the district hospitals provide the complete range of Comprehensive EmOC services, some of the sub-district hospitals that were surveyed provide similar services except for blood transfusions (Table 12). Policy barriers deter the wider availability of blood.

3.2. Proportion of births in EmOC facilities

Overall, 10% of births occur in the facilities surveyed, falling short of the 15% minimum (Table 13). The highest proportion of institutional births took place in Sawai Madopur.

3.3. Met need

Met need is less than 10% and ranges from 5

Table 13
Proportion of births

District	Number of births	Expected number of births	Proportion	Recommended
All facilities surveyed	41 944	420 960	10.0%	> 15%
Udaipur	3073	66 650	4.6%	
Sawai Madopur	5802	34 720	16.7%	
Bhilwara	7464	61 380	12.2%	
Alwar	8013	89 280	9.0%	
Bharatpur	8330	63 860	13.0%	
Chittorgarh	4518	55 180	8.2%	
Karauli	4744	33 480	14.2%	

Table 14
Met need

District	Number of women with complications treated	Expected number of complications in population	Met need	Recommended
All facilities surveyed	5604	63 144	8.9%	100%
Udaipur	530	9998	5.3%	
Sawai Madopur	407	5280	7.7%	
Bhilwara	1120	9207	12.2%	
Alwar	1397	13 392	10.4%	
Bharatpur	785	9579	8.2%	
Chittorgarh	937	8277	11.3%	
Karauli	428	5022	8.5%	

to 12% at the district level, suggesting that many women with obstetric emergencies are not receiving adequate care (Table 14). Some women with complications may attend private facilities and these private facilities were not surveyed. Thus, met need at the state or district level may be underestimated, but because the private health sector in Rajasthan is not well developed, the true situation may not be very different.

3.4. Cesarean deliveries as a proportion of all births

Only approximately 1% of all deliveries are cesareans, falling short of the recommended lower level of 5% (Table 15).

3.5. Case fatality rate for districts reporting hospital maternal deaths

The overall case fatality rate exceeds the re-

commended maximum of 1% and ranges from a low of 0.2% in Karauli to 2.3% in Bhilwara (Table 16). High case fatality rates may be affected by a shortage of blood, anesthesia, or qualified staff contributing to inadequate treatment. In addition, some women must travel considerable distances to reach care.

4. Conclusions

Like the previous Program Note [2], we have described the baseline indicators in three country projects. The UN indicators in each of the countries point to specific interventions that are needed. In the case of Bhutan and Cameroon, Comprehensive EmOC services are in place al-

Table 15
Cesarean deliveries

District	Number of cesareans	Expected number of births	Proportion	Recommended range
All facilities surveyed	5051	420 960	1.2%	5–15%
Udaipur	200	66 650	0.3%	
Sawai Madopur	184	34 720	0.5%	
Bhilwara	1120	61 380	1.8%	
Alwar	1397	89 280	1.6%	
Bharatpur	785	63 860	1.2%	
Chittorgarh	937	55 180	1.7%	
Karauli	428	33 480	1.3%	

Table 16
Fatality rate

District	Number of maternal deaths/complications	Case fatality rate	Recommended maximum
All facilities surveyed	79/5051	1.6%	1%
Udaipur	4/200	2.0%	
Sawai Madopur	9/184	2.2%	
Bhilwara	26/1120	2.3%	
Alwar	12/1397	0.8%	
Bharatpur	16/785	2.0%	
Chittorgarh	11/937	1.2%	
Karauli	1/428	0.2%	

though access to them may be made difficult by geography or transportation. Because many obstetric complications can be resolved at the Basic EmOC level, project efforts should be directed at increasing access to Basic EmOC facilities, especially in Cameroon. The Indian state of Rajasthan has an even mix (proportionately) of Basic and Comprehensive facilities although the numbers fall short of the recommendations.

In Cameroon only 6% of women delivered in hospital, almost 15% in Bhutan and 10% in Rajasthan. Met need ranged from 6% in Cameroon to 19% in Bhutan. Although met need was extremely low in Cameroon, one in five women who delivered in facilities had an obstetric complication. Delivering at home is clearly the common practice in these three countries, which is a problem when women cannot or do not seek EmOC services when the need arises.

The small proportions of births delivered by cesarean in each country further indicate that many women are not receiving the emergency care they need. As facilities add services to those they already provide, drugs and equipment are increasingly in stock, staff are receiving specialized training in EmOC, and services are better organized, we hope to measure an increase in the

number of pregnant women seeking maternity services, especially those who have complications.

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. The Working Group on Indicators thanks the teams from Bhutan, Cameroon and Rajasthan for sharing these early results with others.

References

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