

Monitoring unmet obstetric need at district level in Morocco

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Summary

Unmet obstetric need was assessed in Taounate province (Morocco) during the year 1995 by monitoring rates of major obstetric intervention for absolute maternal indications. We report results in terms of spatial distribution of the failures of the health care system to provide women with essential emergency obstetric care. An estimated 135 women with life-threatening conditions did not benefit from the obstetric interventions they required. The paper documents the effects of the monitoring process on the way the provincial team changed their way of dealing with deliveries. Assessment of unmet obstetric need in Taounate province proved feasible and affordable without external budgetary inputs. It provided the team with information on the magnitude of a previously ignored problem. The results were so dramatic as to lead the team to look for causes and solutions. These were clearly not merely technical but systemic in nature.

keywords Morocco, obstetrics, needs assessment, monitoring, district health system, unmet obstetric need.

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Introduction

Developing countries often lack precise information on maternal ill-health, even on its most extreme consequence, maternal mortality. Until lately, the size of the problem was largely unknown (Mahler 1987). These last years maternal mortality estimates are increasingly becoming available, based on surveys using the sisterhood method (Graham *et al.* 1989; David *et al.* 1991; Chiphangwi *et al.* 1992; De Groof *et al.* 1993; Shiferaw & Tessema 1993; Oosterhuis 1993; Walraven *et al.* 1994; Wirawan & Linnan 1994; Hernandez *et al.* 1994; Shahidullah 1995; Cutts *et al.* 1996; Danel *et al.* 1996; Le Bacq & Rietsema 1997; Vork *et al.* 1997; Garenne *et al.* 1997) or interviews of relatives or neighbours selected on a probability sample (Kwast *et al.* 1986; Boerma & Mati 1989). At district level, however, it is difficult to measure maternal mortality ratios as a matter of routine. First, because this requires an important data collection effort at community level, often beyond the capacity of district health services. Second, because district level surveys with, e.g. 2000 or 3000 respondents do not allow to safely exclude chance as an explanation for year to year variations (due to random fluctuations and to the erratic pattern of the method) (Maine *et al.* 1992; Garenne & Friedberg 1997), thereby foreclosing their usefulness for monitoring the results of efforts to improve the situation.

However, as long as there is no idea of the size of the problem, nor of its localization and its vulnerability to possible solutions, those in charge of health services at district level have little basis to start planning interventions in order to reduce it (de Kadt 1989). An alternative to using mortality ratios as an indicator of the health services' effectiveness in covering maternal needs is to assess to what extent the need for major obstetric interventions is covered (De Brouwere *et al.* 1996a).

The concept of Unmet Obstetric Need (UON) refers to the discrepancy between what the health care system should do to deal with the obstetric problems in a given population, and the care it actually delivers. Operationally, UON is expressed in terms of women who should have benefited from an obstetric intervention, but for whom this intervention did not take place.

One cannot, of course, merely look at crude intervention rates (e.g. C-section rates) since these are often more influenced by supply or induced demand rather than by need. This results in the well-documented large variations in operative delivery rates throughout the world (Thiery & Derom 1986; Lomas & Enkin 1989; Barros *et al.* 1991; Macfarlane & Chamberlain 1993; Francome & Savage 1993; Notzon *et al.* 1994; van Roosmalen & Van der Does 1995; Porreco & Thorp 1996). It is possible, however, to consider only those interventions that are performed for absolute

A. Belghiti *et al.* **Unmet obstetric needs in Morocco**

maternal indications (AMI) such as severe ante-partum haemorrhage, placenta praevia and abruptio placentae; severe postpartum haemorrhage requiring surgical intervention; foetopelvic disproportion, including prerupture and uterine rupture; shoulder or transverse lie and brow presentation. This has the major advantage of yielding an indicator that more specifically relates to meeting (or not meeting) real needs. These AMIs indeed reflect conditions that, without intervention, carry a high probability of the women dying in childbirth or having sequelae.

It is possible to make low-end estimates of the frequency of such indications for major obstetric interventions (i.e. of the amount of need that must be covered). This can be done either by reviewing the indications of MOI in (urban) areas without problem of access; or by extrapolating from the few population-based studies with data on the indications for MOI (Butler & Bonham 1963; Van Lerberghe *et al.* 1988; De Brouwere *et al.* 1996b). If a suitable and realistic rate is chosen as a reference, it becomes possible to estimate UON by comparing observed MOI for AMI with the reference rate, without resorting to major investments in survey operations. Low-end estimates of these rates range between 1 and 2% of expected deliveries (Peter *et al.* 1982; Van den Broek *et al.* 1989; Maillot *et al.* 1991; Francome & Savage 1993; De Brouwere *et al.* 1996b). The discrepancies between observed and expected rates of MOI/AMI can be used, not as a direct indicator of maternal mortality, but as one indicator of failures of the health care system to provide adequate delivery care. These estimates can be used to compare areas, identify those where UON is the most important, and monitor progress over time with considerably less investment than what would be required for monitoring maternal mortality through surveys.

Estimating UON necessarily involves those responsible for implementing maternal care, if only to break down MOI in those done for AMI and others. The process of estimating UON immediately highlights key areas for improvement to these health workers: hence, it acts as a spur for intervention as much as as a tool for measurement. Measurement, indeed, is not the only goal pursued in launching a UON exercise. Rather, what is aimed at is (i) to help create the political momentum in favour of maternal health; and (ii) to initiate progress at local level by changing attitudes, mobilizing resources and adapting practices.

This approach has been used in Morocco in the early nineties, together with an effort to make an inventory of the hospital maternity resources, in order to quantify unmet needs and to identify those districts for which some form of strengthening would be a priority (INAS 1992). But apart from its usefulness for planning purposes, this approach has also largely contributed to changing attitudes and behaviour of actors, at central level (De Brouwere 1997).

The objective of this paper is to document the implementation of a UON exercise at district level in Taounate province (Morocco), the assessment of UON it yielded, and the effect of the monitoring process on the dynamics within the health district team.

Context and monitoring methods

Taounate is a rural province of some 5600 km², north of the prestigious city of Fes. It has a population of about 628 000. There are four districts, each with a 40-bed rural hospital without surgical facilities. Three health centres have facilities for deliveries; the 35 other first-line units in the province offer only ambulatory care. In 1995 there were 33 medical doctors (two of whom were specialized consultants) in Taounate province, spread over 15 of the 42 health care units; the other units (mainly rural dispensaries) were run by nurses. There is no operating theatre in the province and the referral hospital is the one in Fes, at a distance of 84 km from the provincial capital (Taounate-City).

On the basis of the 1994 census (Direction de la Statistique 1994), 21 392 deliveries were expected in 1995 (Ministère de la Santé Publique du Royaume du Maroc 1995). Twenty-one percent attended an antenatal care clinic at least once. 2499 deliveries took place in the seven provincial maternity wards and 461 in the regional hospital of Fes. Very few occurred in private clinics in Fes-City. The vast majority of deliveries (some 85%) took place at home.

For the UON exercise all institutional deliveries of Taounate residents in 1995 were examined, i.e. those within the Taounate health facilities and in the referral hospital of Fes. Data on admissions and referrals to Fes were collected routinely by the nurse in charge of the delivery wards of the Taounate health facilities, and collated monthly for the whole province. Every three months the programme co-ordinator of Taounate province went to Fes to get the information on deliveries of Taounate women in the referral hospital. The sources of information were the hospital's general admission register, the maternity ward's admission register and the operating theatre register. Data recorded were dates of admission of women from Taounate province, their addresses, referral status, delivery outcome and, where applicable, indication and type of obstetric intervention. Records were linked manually on name, address and village. All data were compiled and analysed quarterly at provincial level and written feed-back was sent to the doctors in charge of the health centres.

The district health team thus monitored two types of information: the movement of the women through the health care system (including referral during labour, compliance with referral advice, self-referral), and the spatial distribution of rates of major obstetric interventions according to the

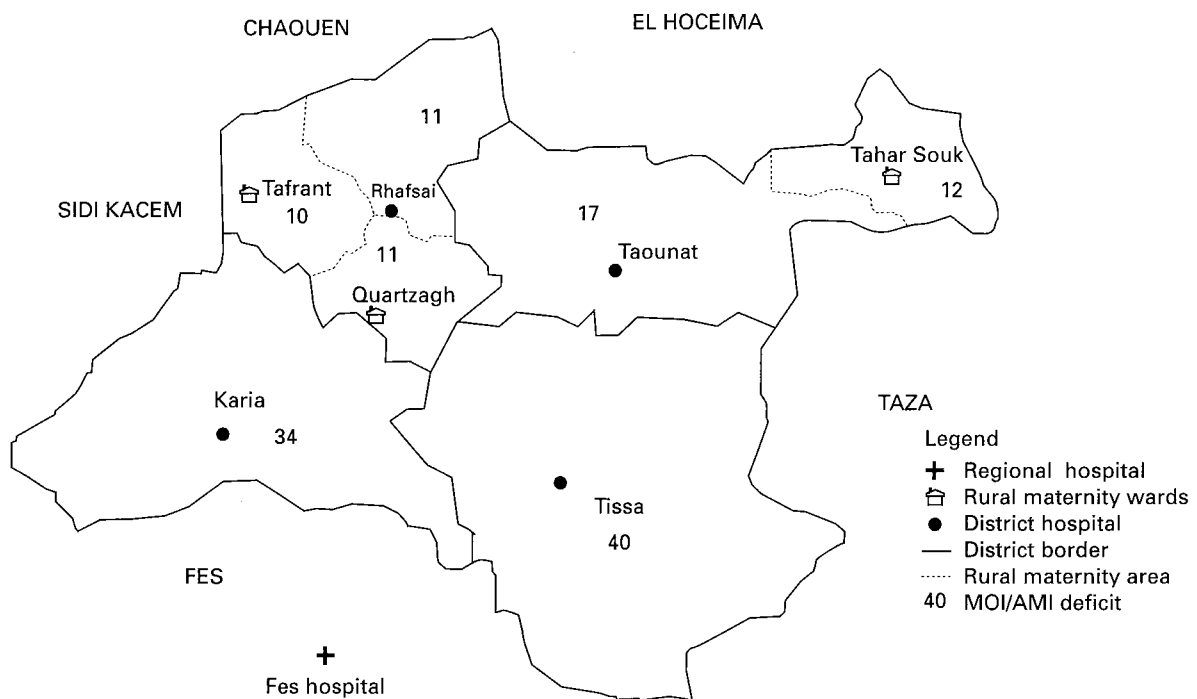


Figure 1 Calculated deficits (expressed as numbers of interventions) by area of geographical origin (Taounate Province 1995).

geographical origin of the women. The geographical unit chosen was the area of responsibility of each delivery ward in Taounate province. In two cases this corresponds to the whole health care district; in five other to subdistricts (Figure 1). Each of these geographical units comprises at least 1000 expected births per year, and a health care unit that is held accountable for ensuring safe deliveries in the area. Special attention was given to the group of MOI for 'absolute maternal indications' (AMI). In Morocco, the national survey reported a median MOI for AMI rate of 1% of expected deliveries in urban areas with reasonable access to emergency obstetric care (De Brouwere *et al.* 1996b). These are at the low end of the rates observed elsewhere, and were considered suitable minimal reference points for assessing the problem in Taounate district. Applying this rate of 1% to the numbers of expected births per geographical area (the areas of responsibility of the delivery wards) results in the expected numbers of women who should have had a MOI for the above-mentioned AMI. Subtracting from this expected number the number of women who really had a MOI for AMI, results in the deficit in terms of (untreated) women for a given area.

Outputs of monitoring

Health units with a maternity ward admitted between 2.8 and 27% of expected deliveries in their area of responsibility

(Table 1). Slightly less than one out of seven of the 2893 women admitted has been referred, during labour, to the hospital in Fes. Less than half of those referred actually arrived in the hospital in Fes. Sixty percent of the Taounate women who delivered in the referral hospital had come directly to the hospital in Fes, without transiting through the maternity wards in their district or subdistrict (Table 1). Compliance with referral to Fes is not significantly related to the distance between the area of the delivery wards and Fes (Pearson's correlation test, $P = 0.204$) (Table 1). Twenty-seven percent of referred women who arrived in Fes underwent a major obstetric intervention, against 22% of self-referred women (Table 2). The difference is not statistically significant ($P = 0.19$).

Out of a total of 461 Taounate women who delivered in the referral hospital in Fes, 111 underwent a major obstetric intervention (Table 3). The indications for these interventions were: ruptured uterus (22), transverse lie (16), prolonged active phase of labour (13), foetal distress (10), cephalopelvic disproportion (5), poor uterine contractions (5), brow presentation (4), ante-partum haemorrhage (3), cord prolapse (1), and breech presentation (1). For 30 interventions no precise indication was recorded. Absolute maternal indications were present in 62% of the interventions with known indication (50/81) and in 45% of the total number of interventions (50/111). The rate of MOI/AMI related to

A. Belghiti *et al.* **Unmet obstetric needs in Morocco****Table 1** Place of delivery and referrals for Taounate women in 1995

Area of delivery ward (distance from Fes hospital in km)	Expected births (1)	Admitted for delivery in Taounate (% of 1) (2)	Referred to Fes (% of 2) (3)	Admission in Fes (referred) (% of 3) (4)	Admission in Fes (self-referred) (% of 6) (5)	Total admissions in Fes (4 + 5) (6)
Taounate (84)	4544	1216 (27%)	103 (8,5%)	65 (63%)	70 (52%)	135
Tahar Souk (130)	1704	131 (7,7%)	11 (8,4%)	0 (0%)	10 (100%)	10
Tissa (42)	5778	527 (9,1%)	72 (13,7%)	40 (56%)	80 (67%)	120
Karia (60)	4984	632 (12,7%)	155 (24,5%)	58 (37%)	69 (54%)	127
Rhafesai (120)	1548	208 (13,4%)	18 (8,7%)	5 (28%)	22 (81%)	27
Ourtzagh (100)	1274	135 (10,6%)	15 (11,1%)	4 (27%)	9 (69%)	13
Tafrant (120)	1560	44 (2,8%)	20 (45,5%)	11 (55%)	18 (62%)	29
Total	21 392	2893 (13,5%)	394 (13,6%)	183 (46%)	278 (60%)	461

Table 2 Outcomes of deliveries in Fes by area of geographical origin and by referral status (referred or not) in 1995

Area of delivery ward	Referrals				Self-referrals			
	Admitted	MOI (% of arrived referrals)	Difficult delivery	Normal delivery	Admitted	MOI (% of self-referred)	Difficult delivery	Normal delivery
Taounate	65	19 (29%)	8	38	70	18 (26%)	10	42
Tahar-Souk	0	0	0	0	10	5 (50%)	0	5
Tissa	40	12 (30%)	7	21	80	14 (18%)	7	59
Karia	58	13 (34%)	7	38	69	13 (19%)	7	49
Rhafesai	5	1 (20%)	1	3	22	7 (32%)	3	12
Ourtzagh	4	1 (25%)	0	3	9	1 (11%)	1	7
Tafrant	11	4 (36%)	2	5	18	3 (17%)	2	13
Total	183	50 (27%)*	25	108	278	61 (22%)*	30	187

* χ^2 test = 1.74; not significant ($P = 0.19$). MOI, major obstetric intervention.

expected births was 0.23% for Taounate province as a whole, ranging from 0% to 0.35% in the different geographical units. If one assumes that the MOI without recorded indication were all done for AMI, the overall rate was 0.37%, ranging from 0.16% (Ourtzagh) to 0.62% (Taounate-City) (Table 3).

These rates were then used to calculate a deficit of MOI/AMI per geographical unit, by comparing them to the expected rate of 1%. Out of 214 expected interventions, only between 50 and 80 (for the latter figure assuming that unregistered indications correspond to AMI) were actually carried out: a deficit of 134–164 (Table 3). The distribution of these deficits is visualized on the map of Taounate province (Figure 1). There is a deficit of 11 interventions in Ourtzagh, where the relative deficit is 0.84%, while Tissa has a deficit of as much as 40 interventions with a relative deficit of 0.69% but a higher number of expected births.

Monitoring as an instrument of change

Measuring rates of MOI for AMI is theoretically simple, and limiting calculations to a group of indications for which an incidence can be estimated makes it easy to calculate deficits. In practice, however, there can be several difficulties.

To begin with, it is not always easy to obtain reliable figures on the expected births per area. In Taounate the census of 1994 provided a reliable denominator that could be extrapolated safely to 1995, even at the level of district or subdistrict.

But it may be even more difficult to obtain a reliable numerator, i.e. a complete inventory of MOI performed for AMI. The national survey of 1989 had shown that only 3 Taounate women had an obstetric intervention (all three not major) outside Taounate or Fes (INAS 1992). An inventory of interventions limited to Fes would thus not underestimate the total number of major obstetric interventions. There is no

A. Belghiti *et al.* **Unmet obstetric needs in Morocco****Table 3** Numbers and rates of MOI from Taounate province in 1995, by group of indications and by area of delivery ward

Area of delivery ward	Expected births (EB)	MOI for AMI (rate for 100 expected births)	MOI without precise indication	Other MOI	Total MOI	Number of MOI for AMI + MOI without precise indication	Proportion of (MOI for AMI + MOI without known indication) as compared to total number of EB	Deficit†
Taounate	4544	16 (0,35%)	12	9	37	28 (19--41)*	0,62%	17
Tahar Souk	1704	4 (0,23%)	1	0	5	5 (2--12)*	0,29%	12
Tissa	5778	13 (0,22%)	5	8	26	18 (11--28)*	0,31%	40
Karia	4984	11 (0,22%)	5	10	26	16 (9--26)*	0,32%	34
Rhafsai	1548	3 (0,19%)	2	3	8	5 (2--12)*	0,32%	11
Ourtzagh	1274	0 (0%)	2	0	2	2 (0--7)*	0,16%	11
Tafrant	156	3 (0,19%)	3	1	7	6 (3--14)*	0,38%	10
Total	21 392	50 (0,23%)	30	31	111	80 (63--100)*	0,37%	135

Poisson 95% Confidence Intervals. †EB[0.01 – rate of (MOI/AM + MOI without known indication)]; example: Taounate: 4544 *(0.01–0.0062) = 17.

reason to suppose that this situation would have changed in the nineties.

In Fes routine registration of MOI is complete. Administratively it is practically impossible not to register such an intervention. A possible source of underestimation of the number of MOI would be that Taounate women would have given a wrong address; since, however, this would not have provided any advantage for them, it is highly unlikely that this would have affected the data in a significant way.

Major obstetric interventions in private sector institutions are considered exceptional for women from Taounate, who generally speaking cannot afford private medical care. In 1989 only one woman (2.5% of all MOI/AMI performed for Taounate women) had a major obstetric intervention for absolute maternal indication in the private sector (INAS 1992). It is difficult to imagine that the number of interventions carried out in private institutions would have been far higher in 1995.

Thus, underestimation of the number of MOI is probably marginal only. Specification of MOI/AMI is more problematic. For 28% of the major interventions there was no record of the indication. It is likely that when register and logbook entries were not completed, this was because of the urgent nature of the intervention. This would plead in favour of considering the MOI without specified indication as MOI/AMI. Even so, the rates of MOI/AMI per expected birth remain very low. It is not possible to state positively that all the women who did not have the benefit of a major intervention for AMI have died. But it is very unlikely that the most essential obstetric needs were adequately met with intervention rates of less than 0.3–0.4% (Table 3).

The monitoring exercise provided an overall picture of the magnitude and location of the failures of the health care system to meet the most dramatic obstetric needs. This, however, makes sense only if obtaining such information leads to improvement. An unmet obstetric need exercise indeed is not only a question of measurement: the ultimate objective is to mobilize the health system's actors for positive change. For this reason the information was collected and analysed by the provincial team in charge of maternal health programs and not by external researchers. Results were disseminated to those in charge of health centres and delivery wards, for information and discussion. Quarterly meetings were organized with all the officers in charge of health centres, in order to try and identify possible actions that could reduce the problem of unmet obstetric needs. The impact of these meetings on the awareness of the staff in Taounate province was considerable, in terms of attitudes and behaviour. Whether this was due to the information as such, or to the Hawthorne effect resulting from the analysis of the data is less important than the fact that it took place.

First, there was a new understanding of the potential of 'information'. The routine collection of data, previously perceived as work of little usefulness, took on a different meaning. Information became an instrument of decision-making and evaluation, which required the highest level of reliability in order to be useful.

Second, the physicians started to take an interest in how deliveries were carried out. As a result of this –new– supervisory activity, they began to order specific technical equipment in order to improve the quality of delivery

A. Belghiti *et al.* **Unmet obstetric needs in Morocco**

assistance. They also looked for ways to improve the comfort and cleanliness in delivery wards.

Third, the staff was surprised by the relative lack of performance of the referral procedures. The proportion of MOI among the women they referred was very similar to that among self-referred women, hence a need to review the referral criteria. Moreover, more than half of the referrals to Fes never got to the point of being admitted in the hospital. For the health staff this lack of compliance was obviously at least partly related to problems with transport. Within the same year they managed to secure means of transportation through a combination of mobilization of contributions of the local administrative authorities, and political pressure to arrange for or obtain transport for each health facility with a maternity ward. By the end of 1995 each delivery ward had an ambulance.

Fourth, the lack of compliance was obviously also related to refusal on the side of the patients and/or their relatives for various reasons pertaining to their perception of the health system. This led the health staff to change their attitude towards the population. From a rather paternalistic attitude – ‘these people are ignorant’ – they evolved toward a more responsible one: ‘what can we do in order to reduce these deficits?’. They tried to get training in doctor-patient communication in order to improve their listening capacity when dealing with women in labour, but also with patients in the curative clinic setting. An indication of the importance given to this was that there was no question of organizing this training in a way that would generate extra income in the form of per diem.

Finally, the UON exercise led personnel to tackle dysfunctioning, not only within their district and in their way of dealing with individual patients, but also of the regional referral hospital. Psychologically, this is a major step in a context where the referral hospital also is the recognized professional reference. Hospitals are the preferred working environment for most doctors and paramedical staff in Morocco, and seen as the place where ‘good medicine’ is practised (Mebtoul 1994). In anthropological terms they are the temples where medical and paramedical professionals have been initiated and trained, and from which they derive their role models. In a hierarchical service environment such as Morocco, a major hospital is not conditioned by the rest of the system, except by the fact that it needs it to cast off excess workload. Large and complex hospitals function in a self-contained way, disconnected from the rest of the system. They are busy places with occasionally frantic levels of activity. All this makes them technically appreciated and powerful institutions where human relations are not necessarily the prime concern. Individual clients have to brace themselves before confronting them, but so have the officials who represent the peripheral health system.

This representation of large hospitals as threatening and self-sufficient institutions helps to explain the fear or aversion of rural women of the (city) hospital when referred. It also explains why the programme co-ordinator of Taounate province had to go and collect the Fes data himself: in spite of formal agreements they would not have been forthcoming. It should not be forgotten, of course, that the initiative for this monitoring exercise came from outside the hospital and even from outside the Fes province in which it is located. It required extra workload from the hospital staff. Such requests do not fit with the hospital’s institutional culture nor is it customary for district level officials to request this type of information, certainly not on sensitive issues related to quality of care. The fact that the data were obtained nonetheless is an indicator of the self-confidence the Taounate provincial team gained through the UON exercise.

Conclusion

Assessment of unmet obstetric need in Taounate province proved feasible and affordable without external budgetary inputs for data collection and analysis. It provided the team with information on the magnitude of a previously ignored problem. The results were so striking as to lead the team to look for causes and solutions. These were clearly not merely technical but systemic in nature. Measuring unmet obstetric need in Taounate brought the personnel to new awareness of their own central role in the system. Ultimately this may prove more important for the improvement of the functioning of the health care system than the numerical information as such.

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A. Belghiti *et al.* **Unmet obstetric needs in Morocco**

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A. Belghiti *et al.* **Unmet obstetric needs in Morocco**

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