

# Measuring unmet obstetric need at district level: how an epidemiological tool can affect health service organization and delivery

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A national retrospective survey on the unmet need for major obstetric surgery using the Unmet Obstetric Need Approach was carried out in Mali in 1999. In Koutiala, the district health team decided to carry on the monitoring of the met need for several years in order to assess their progress over time. The first prospective study, for 1999, estimated that more than 100 women in need of obstetric care never reached the hospital and probably died as a consequence. This surprising result shocked the district health team and the resulting increased awareness of service deficits triggered operational measures to tackle the problem.

The Unmet Obstetric Need study in Koutiala district was implemented without financial support and only limited external technical back-up. The appropriation of the study by the district team for solving local problems of access to obstetric care may have contributed to the success of the experience. Used as a health service management tool, the study and its results started a dialogue between the hospital staff and both health centre staff and community representatives. This had not only the effect of triggering consideration of coverage, but also of quality of obstetric care.

**Key words:** reproductive health care, obstetric need, health service management, Mali, health care reform

## Introduction

Health care reform in Mali started formally in 1990 with the establishment of a new health policy. This policy relied on the development of community health centres to provide a minimum package of care (including essential drugs); community involvement in the process (aiming at total community ownership); and a structural shift from an essentially administrative district structure to a two-tier operational structure (Maïga et al. 2003).

Early in the process, the perinatal and maternal care programme was used as one of the spearheads of the reform. The problem, however, was operationalization: how to trigger willingness and capacity for change among policy makers as well as operators in the field. The starting point for this was to raise awareness of the magnitude of the maternal health problem. Over the last decade, champions of maternal health have relied heavily on maternal mortality survey results to get maternal health on the policy agenda (De Brouwere et al. 1998; AbouZahr 2001). This has met with some success, but clearly aggregate national estimates are not sufficient to generate commitment for both local and nationwide action. Moreover, in developing countries, the maternal mortality ratio (MMR) is estimated from surveys with confidence intervals too wide to detect statistically significant changes in maternal mortality (UNICEF et al. 1997; AbouZahr 1999). This makes the MMR a too imprecise measurement to monitor safe motherhood interventions at

district level (Graham et al. 1996). Thus, process indicators remain the basic tools of safe motherhood evaluation in developing countries (Maine et al. 1997, Ronsmans et al. 2002).

Maternal mortality is an avoidable tragedy. The response to this tragedy has to be a response by society; not all of it can be reduced to failures of health care delivery systems. A sizeable portion, however, could be addressed by a more adequate – and more accountable – response by health professionals. These professionals often do not respond adequately because they do not realize how big the problem is in their own community, or how this problem can be addressed concretely.

In order to map the magnitude and distribution of maternal health problems that can be tackled by an effective integrated health care system, the Mali Ministry of Health (MOH) decided to carry out a national survey of the unmet need for major obstetric surgery at the end of 1998. The MOH used the Unmet Obstetric Need (UON) approach (UON Network 1998), which seeks to provide health professionals with the information needed to start improving their performance, and to give society the means to exercise pressure on professionals to improve their behaviour and accountability. This approach uses an indicator belonging to the process indicator category aiming at measuring met need for obstetric care (Ronsmans et al. 2002). Particular to the UON method is its self-assessment nature: the active

participation of the health professionals is a condition *sine qua non* and stimulates ownership of the results. Moreover, the UON method does not aim to merely produce data, but considers these data as a means to improve quality of care and of services. In encouraging a reflective attitude regarding maternal health status, the UON indicator points health service managers to service deficits that may be reduced by appropriate intervention.

The objective of this paper is two-fold. It aims to show: (1) that it is feasible for a district health team to carry out a UON study and to generate reliable data that are relevant for local decision-making without external support; and (2) how the UON method triggers dynamic changes and leads to decisions and actions to decrease the unmet obstetric need.

**Methodology**

This paper describes the dynamic interaction between the exercise of measuring the unmet obstetric need (UON) in a health district, an epidemiological technique, and the process of change and decision-making by a district management team, a managerial activity. To study this interaction, we resort to a single case-study methodology. The presentation of our case is based on a retrospective analysis of events that took place during the period 1998–2001 in Koutiala district.

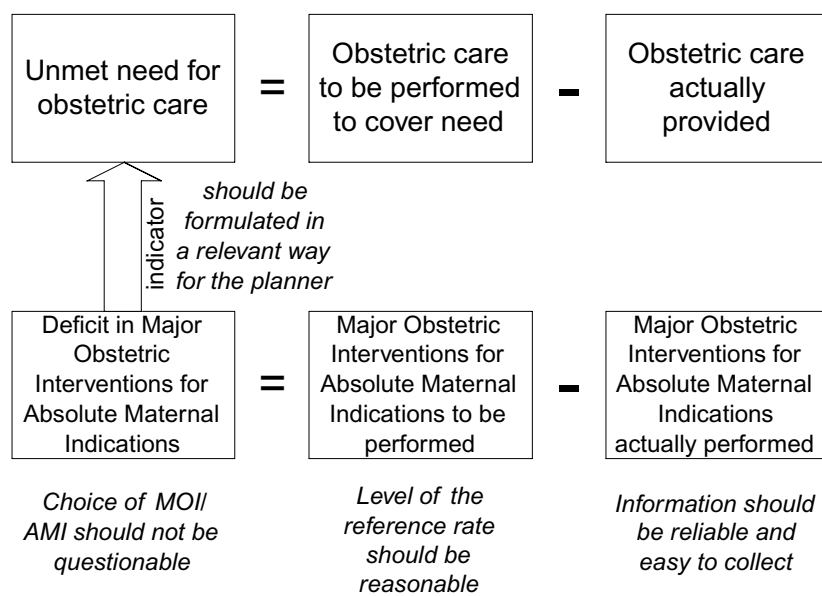
Our case is structured along two tracks. In a first track, we describe the process and the results of the UON exercise as it was conducted in the district of Koutiala. The detailed methodology of the UON exercise and its rationale have been extensively documented elsewhere (UON Network 1998). In a nutshell, the UON indicator measures the gap between the expected major obstetrical interventions required for a given well-defined population, such as a health

district (needs), and the actual delivery of these services to this population (Figure 1).

The UON approach emphasizes the process of designing the indicator and collecting data, which must be participatory, with the implication of local providers, as much as the results and their interpretation, which are expected to raise awareness and trigger reaction from health care services management staff. Therefore, in the next section we report in detail how the data were collected, describing together the process and the results of the UON exercise in Koutiala district. The data collection method and its appropriation by the district team is indeed intrinsically bound with the case report.

In a second track, we describe and analyze the dynamic change of perceptions which occurred along the process within the management team. Following the case study methodology, we resort to various sources of information and various methodologies to gather the information and build a narrative on which we base our interpretation (Yin 2003). Given the structure of our case, we present two types of results: on the one hand, the UON indicator in Koutiala district, quantitative by nature, and on the other hand, the description of the process, narrative by nature, and for which we propose an interpretation.

For both tracks, our case draws from four sets of information. A first set is constituted by the UON exercise documents. The second set are the data obtained through the UON exercise to calculate the UON indicator. A third source of information comprises the documents and information produced routinely by the health services (meeting minutes, administrative documents, decisions and exchanges of information etc.). The fourth source of information is a set of subsequent interviews of the main leader of the exercise in



**Figure 1.** Indicator of unmet need for major obstetric interventions

the field. The objective of these interviews was to retrospectively reconstruct the history of the process and the dynamic of the change of perception it induced. The challenge was to separate the factual information from its interpretation. To do so, an 'external researcher', not involved in the field at any stage of the process, conducted subsequent in-depth interviews with an 'internal researcher'<sup>1</sup>, actually one of the leaders of the exercise in the field. The analysis of one interview served as a basis for structuring the next interview. At each stage, the information produced by each interview was systematically confronted with factual elements also gathered and an interpretation of the process was proposed by the external researcher and discussed by the internal researcher, looking for discrepancies. After four rounds of this process, no further information was generated. A synthesis was then made leading to an interpretation.

## Maternal health in Mali: context and background

### The health care reform in Mali

Mali is a large country (1 240 000km<sup>2</sup>) with a scattered population of around 10 million inhabitants, 7.5–8 million of whom live in rural areas. Health services are not easily accessible for the majority of the rural population. In 1999, some 60% of the population were living within 15km of a primary-level health facility offering a basic package of activities, and 36% lived within 5km of such a facility (Ministère de la Santé 2000). This situation, modest though it may seem, has been achieved by a remarkable dynamic that has enabled Mali to double its health coverage in less than 10 years.

Until the end of the 1980s, the health services were judged to be of poor quality, in part because of low availability of drugs in public health facilities. The health indicators reflected this state of affairs, with an infant mortality rate of 125 per 1000 and maternal mortality of around 1200 per 100 000 live births (UNICEF-Mali 1992). During the 1980s, however, a number of projects contributed to laying the basis of a reform of the country's health sector. The Health Development Project, supported by the World Bank, established the first experimental community health centres (CS-Com) (Maïga et al. 2003). Others experimented with user fees and with arrangements for ensuring the availability of essential drugs. These experiments showed that the populations were prepared to pay for services of better quality. In 1989, an *ad hoc* group drew up a 'Conceptual Framework of the Bamako Initiative' adapted to the Mali context (Ministère de la Santé 1989), which sets out principles for the organization of the health sector: decentralization, involvement of the population in the management of health centres and ensuring the availability of essential drugs. This formed the basis of the formulation of the new health policy in 1990, which envisaged the extension of the coverage of health services and the improvement of the quality of health services and their financial viability (Ministère de la Santé 1990). The architecture of this reform rested on a two-tier district health system: a network of primary-level health services (CS-Coms) and the district hospital at the secondary level. The various partners of the Mali government progressively undertook to provide

financial support for this policy between 1991 and 1994. (Maïga et al. 2003). The Ministry of Health then decided to launch the *Projet Santé Population et Hydraulique Rurale* (PSPHR) to steer the development of the new sectoral policy in the five regions involved in the project. After the PSPHR ended in 1998, the reform was directly implemented by the Ministry of Health administration.

### Essential obstetric care in Mali

Until the early 1990s, the coverage of essential obstetric needs was practically nil outside large towns. The proportion of caesarean sections (Bamako district not included) was of the order of 0.2% of deliveries. However, by developing antenatal clinics and rural maternity homes, the safe motherhood programme managed to draw the population's attention to the severity of obstetric problems. While the strategies followed at primary level made it impossible to avoid obstetric accidents that called for professional obstetrical intervention, the availability of funds for the perinatal care programme provided an opportunity for strengthening the referral level. Decision-makers realized fairly soon that the problem lay not only at hospital level. It was not only a matter of training specialist teams and providing the necessary equipment in district hospitals; it was necessary to develop the whole system (primary level, referral and evacuation, technical resources in hospitals, viable mechanisms for financing services), including mobilization of the community.

From 1994/95 onwards, arrangements for improving the machinery of referral were progressively tested in certain districts. This involved setting up communication links between CS-Coms and hospitals (radio communication, ambulance services), and ensuring the availability of the necessary technical resources (trained staff, equipment and drugs). Financial viability was achieved by establishing cost-sharing mechanisms in which funds were managed at district level. From 1997, this strategy was promoted throughout the whole country (Division de la Santé Familiale et Communautaire 1997). The development of this system of referral and evacuation, however, was slow. In 1998, when the MOH decided to carry out a UON study at national level, there were only seven districts running a system of referral and evacuation, and in 1999 only 12 out of the country's 55 districts had an effective system. Koutiala district implemented such a referral system financed by a cost-sharing mechanism in January 2002.

### The UON approach in Mali

A UON exercise starts with putting together two pieces of information: an inventory of resources and a mapping of the unmet need for major obstetric interventions performed for absolute maternal indications. It shows, by district, the number of women who should have benefited from a major obstetric intervention but did not. This is done by comparing the interventions carried out – information obtained from hospital registers – with a benchmark of minimal needs. The method is extensively described elsewhere (UON Network 1998, 1999a).

The exercise is restricted to major obstetric interventions<sup>2</sup> for a limited number of maternal indications that are decided by a panel of national experts as life-threatening conditions.<sup>3</sup> This is done for two reasons. First, by doing so all field professionals must necessarily be involved (because the indications of each intervention have to be verified, and this cannot be done without discussion with the doctors and midwives in the hospitals and health centres). This participatory process contributes to increased local ownership and to setting the scene for local change. Secondly, it allows the aggregation of local data to make meaningful inter-district comparisons, and thus provides elements for priority setting (De Brouwere and Van Lerberghe 1998).

In 1999–2000, a national retrospective survey of the unmet need for major obstetrical interventions was carried out by the MOH on 1998 data. In order to interfere as little as possible with the routine functioning of districts, the training of the district team (District Medical Officer, Head Midwife, person in charge of the health information system at district level) in the collection and the analysis of data was organized on-site and carried out by the regional team in collaboration with the central national research team.

## The UON approach in Koutiala district

### UON exercise: a feasible approach for a district team

In this section, we address the first objective of our paper. We present the result of the UON exercise and describe how it was implemented by the district team of Koutiala. Koutiala district is located in Sikasso region (southeast of Mali), the richest region of Mali. The population of 378 500 inhabitants is mainly rural (75%) and spread over 7840 km<sup>2</sup>. In 1998, of 41 health areas, 16 were functioning, i.e. having a community health centre delivering curative and preventive first-line health care. The hospital in Koutiala town was staffed with two medical doctors able to perform emergency surgery.

#### *First study: the prospective study of 1999*

In December 1998, the regional management team, in collaboration with the national research team, organized a half-day training session on how to perform a UON exercise in Koutiala. This allowed clarification of the concept of

absolute maternal indication and major obstetric intervention, as well as explanation of how to use the data collection form and how to calculate the met and unmet need for major surgical interventions.

Instead of waiting for the national team that was expected to lead the collection of 1998 data later in 1999, the Koutiala hospital team decided to start the collection of data prospectively from January 1999. Data gathered concerned all the pregnant women (from week 28 of pregnancy to day 42 post-delivery) admitted in 1999 in Koutiala hospital and who underwent a major obstetric intervention or died while pregnant or in the postpartum period. A questionnaire was completed for every woman meeting these criteria. Sources of data were the operating theatre and maternity ward registers. Population figures for 1999 were derived from the 1998 national census (Direction Nationale de la Statistique et de l'Informatique, 1998). Expected births were calculated with the crude birth rate obtained from the 2001 Demographic and Health Survey (Cellule de Planification et de Statistique 2002) and applied to population figures (Table 1).

#### *Participation in the national retrospective study on 1998 data*

In December 1999, the Koutiala team, together with the national team, retrospectively gathered data on women admitted during 1998. The method was identical to the one applied for the prospective study and the data were collected in a couple of days. These 1998 data were taken by the central national research team, which aggregated all the district databases of the country to constitute the full national UON exercise for the year 1998.

#### *Monitoring progress in 2000 and 2001*

After the end of the above studies, the Koutiala team decided to continue to monitor progress using the same method in 2000 and 2001.

### Findings of the UON exercise: rates and deficits

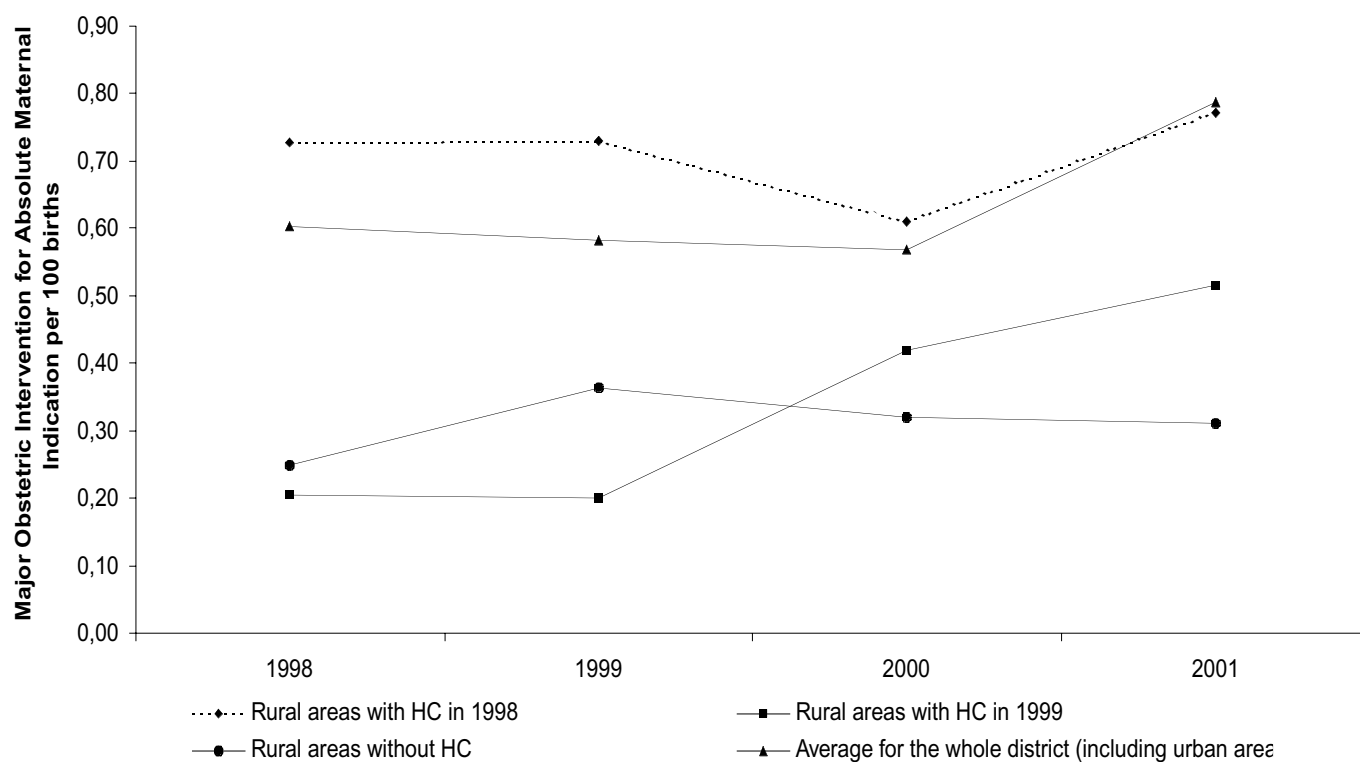
Figure 2 shows the evolution of the rates of major obstetric interventions for absolute maternal indications from 1998 to 2001. These rates are calculated separately for rural areas with and without a functioning health centre. In the urban

**Table 1.** Population and births per health area category, Koutiala, 1998–2001

	1998		1999		2000		2001 <sup>a</sup>	
	Population	Expected births	Population	Expected births	Population	Expected births	Population	Expected births
Urban area <sup>b</sup>	91 147	4 357	93 462	4 467	95 834	4 581	98 457	4 706
Rural areas with a health centre	169 330	8 094	173 630	8 300	178 043	8 510	182 916	8 743
Rural areas without a health centre	118 086	5 645	121 082	5 788	124 166	5 935	127 564	6 098
Total district area	378 563	18 096	388 174	18 555	398 043	19 026	408 937	19 547

<sup>a</sup> Population for 2001 was projected using the 1987–1998 inter-census annual growth rate.

<sup>b</sup> Urban area is defined as population living within a 15 km radius from the referral hospital (providing comprehensive essential obstetric care).



**Figure 2.** Rates of major obstetric interventions for absolute maternal indication according to the category of health areas, Koutiala, 1998–2001

area (population living within a radius of 15km), rates varied from 1.24% in 1998 to 1.01% in 1999, 0.96% in 2000 and 1.64% in 2001. It should be noted that Koutiala district is divided up into 41 health centre areas, but in January 1999, only 15 had a functioning health centre. In the course of 1999, six new health centres were opened in the most remote part of the district.

The first results analyzed by the Koutiala district team concerned the year 1999. Using a benchmark of 1.2 per 100 deliveries as the minimum rate of major interventions for absolute maternal indications,<sup>4</sup> the number of interventions carried out for absolute maternal indication was compared with the expected number and the difference expressed as the deficit. Deficits for the whole district were 110 missing major obstetric interventions (56% of the expected number of major obstetric interventions for absolute maternal indication in 1999, Figure 3), and this was interpreted as the number of women who should have benefited from a life saving intervention but did not, meaning that they probably died or suffered very severe complications.

In 1999, the deficits in rural areas with a functioning health centre were significantly higher, with 23 (40%) missing interventions of the 58 expected, compared with the urban area, where only 9 (17%) among the 54 expected were missing ( $p = 0.007$ ). There was no difference between rural health areas without a health centre and those with a health centre opened in 1999. However, rural areas with a health centre compared with rural areas without a health centre or having

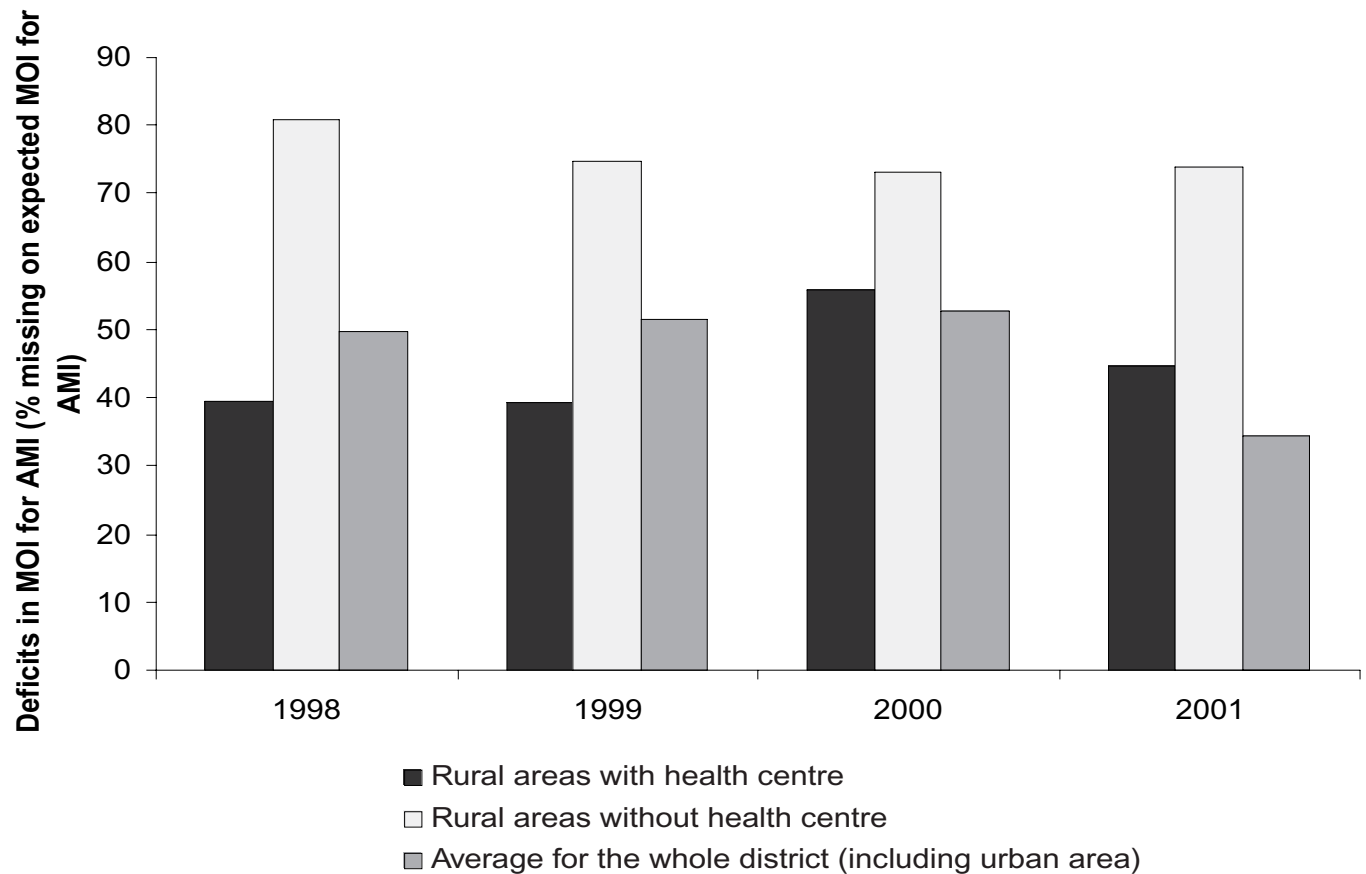
a health centre opened during 1999 showed a significant difference (Mantel-Haenszel chi square test 19.98;  $p < 0.000008$ ).

Comparing areas with and without health centre by year yields statistically significant differences in favour of rural areas covered by a health centre. On the whole, for the 1998–2001 period, 172 interventions were performed in rural areas with a health centre, while 321 were expected, resulting in a deficit of 46.4%. In rural areas without a health centre, 87 interventions were performed, while 361 were expected: a deficit of 69%.

The district team was aware that deficits were only a proxy of the total number of maternal deaths. Indeed, it might be that a woman with such a life-threatening case did survive. However, other causes such as eclampsia, postpartum/abortion haemorrhage and sepsis were not included.

#### Improved team dynamics as a result of the process of the UON studies

In this section, we address the second objective of our paper. We explore the process of the UON exercise in order to provide a clearer insight into how it can affect the dynamics of a district health team. A UON study is logically assumed to increase awareness of the severity of the problem among the members of the team carrying out the study, but the Koutiala experience provides some clues to how it may induce actual measures to improve the provision of care.



**Figure 3.** Deficits in major obstetric interventions for absolute maternal indication expressed in proportion of missing interventions on expected number

Below, we describe this by focusing on felt needs that emerged among team members during the UON exercise.

#### *The need to get correct diagnoses and origins of women*

As soon as data collection started in February 1999, the team was confronted with the poor quality of registered data. Some of the variables required (e.g. age or place of residence of the mother) were just missing, others were poorly recorded (such as ‘dystocia’, which was the diagnosis recorded either for foeto-pelvic disproportion or for dynamic dystocia). The diagnosis established in the maternity ward register (ex ante) was sometimes different from the diagnosis recorded in the operating theatre register. These findings surprised the personnel, who thought they were doing well. A first formal meeting was organized in February 1999 in order to improve the reliability of the diagnosis and to review past records. Measures were taken to improve the reliability of future data recording: daily cross-checking of data entered in both the maternity and the operating theatre registers; assigning to a surgeon the responsibility of notifying a reliable (evidenced) diagnosis in the operating theatre register; and opening of a new register for referred cases from health centres and for evacuations to the regional hospital.

This first meeting had another consequence on the team dynamics: it launched a process of problem solving that led

to a substantial personnel behaviour change *vis à vis* patients and to an increased sense of responsibility. For instance, to correctly calculate the met need for major interventions, the exact origin of women is needed in order to relate coherently the numerator (the women who underwent a major intervention) with the denominator (the expected number of deliveries in the community to which the woman belongs). Asking for the origin of a woman necessarily leads to a discussion with her and her family in order to clarify which village they are talking about (some villages have the same name within the area, therefore precision is needed regarding which is the correct one). Listening to the women, the hospital personnel learned about the difficulties faced by the families to reach the hospital (roads, money etc.): patients progressively were blamed less and received more attention and empathy. These discussions, originally motivated by the need to collect data, helped frame a new type of relationship with the patients and their families. Patients were no more referred to as ‘bed 10’ or ‘bed 4’, but became ‘Mrs Aïssata Traoré from Sassila’ or ‘Mrs Fatoumata Ouattara, from Bombala’.<sup>5</sup>

#### *The need to decrease obstacles to the accessibility of care*

The problem-solving style of the initial meeting organized within the hospital with the aim of improving the quality of the information system rapidly ‘contaminated’ the quarterly

district meeting, in which health centres were represented. Discussions led then to a shared reflection on how to decrease obstacles to access hospital care. In these meetings, a few decisions were made before any result of the UON survey was produced. For instance, the staff decided to keep at least two caesarean section (C-section) kits available in the emergency department so that the woman's family should no longer be required to buy the equipment outside. The delay to reimburse the cost of a C-section kit was extended from 48 hours after the C-section to 7–10 days, and the minor equipment required for examination was made available free of charge.

Later, in collaboration with the health centre heads, other actions were implemented. A permanent radio-communication was organized between hospital and health centres in order to reduce the delay when a referral was decided by a health centre. Heads of villages situated in areas without a health centre were informed and invited to use the neighbouring facility, where nurses promised to warmly welcome patients in need of a transfer. Finally, continuing training of all birth attendants was organized.

#### *The need to improve surgical facilities*

As described above, the first results of the UON study, in 1999, showed important deficits (Figure 3), which were interpreted as a probable loss of 110 women who should have benefited from a life saving intervention in 1999. The staff were shocked by the magnitude of the unmet need. They had already guessed that not all women accessed the hospital, but nobody thought the deficit could be of this order of magnitude. The hospital team met again with the nurses and doctors of the community health centres and discussed the results. This led to the decision to continue to monitor progress in 2000 and to improve the surgical facilities by building a new operating theatre, which would be better equipped and more appropriately designed than the old one. The huge deficit was an argument convincing enough for the representative of the Dutch co-operation (the major donor in the district) to agree to finance the new operating theatre in 2000.

The analysis of the unmet need also highlighted the high case fatality rate: 3.5% of women died after their intervention, mainly due to lack of blood. Koutiala district is not an exception in this. In Mali, 30% of maternal deaths occurring in hospitals are due to haemorrhage (UON Network 2001). Arguing that these deaths could be avoided with adequate transfusion facilities, in 2000 the district team finally received the authorization from the regional authorities to equip the hospital with a blood transfusion service. Until that time, the policy was to forbid blood transfusion in district hospitals because there was no guarantee that transfusion could be safe, and because of the supposedly high technology requirements. Koutiala was the second district hospital in which blood transfusion was set up.

#### *The need to set up a cost-sharing system to improve financial accessibility*

Two years later, in 2001, the UON results of three consecutive years (1998, 1999 and 2000) were presented to

the district team, the villages' leaders and the administrative authorities. The community representatives acknowledged the new type of relationship established with the health personnel. They expressed their concern about the estimated number of women in need of a major intervention and had calculated that a fair coverage of obstetric need would mean the transfer of only five to six women per year per health centre area. A cost-sharing mechanism was then implemented in 2002, under which the health centres' management committees pay 42% of the fees (referral and hospital care included), the woman and her family 23%, the hospital 17% and the MOH 18%.

Finally, the administrative authorities (political representatives of the district council, the mayor and deputies) decided to budget for the purchase of a new ambulance for the next year.

## Discussion

### Validity of the epidemiological results of the UON studies

Measuring rates of major obstetric intervention for absolute maternal indication is a rapid and simple exercise to the extent that data are accessible and valid. In Mali, the last census, carried out in 1998, provided a reliable population figure that could be extrapolated safely to 1999–2001. The denominators (expected births) were calculated by applying the 2001 regional crude birth rates obtained from the DHS 2001 (Cellule de Planification et de Statistiques 2002) to the population with little risk of a significant error.

The validity of the numerator is more difficult to demonstrate. Underreporting of major obstetric interventions at Koutiala hospital is practically impossible. There is, however, a possibility that some of the women underwent a C-section in the neighbouring district (Sikasso, the regional capital town), but the access is not easy (150km from Koutiala) and the cost is higher.

The biggest uncertainty concerns the indication of interventions. Indeed, there is no consensus on what constitutes an absolute maternal indication (Ronsmans et al. 2002) and no evaluation of the reliability of the diagnosis defined. It seems, however, that the UON exercise reinforced the quality of the diagnosis for the purpose of monitoring the progress.

### Validity of the interpretation of the process

The section in which we report on the process of the UON exercises in Koutiala does not provide hard evidence to prove that the discussed changes in health service organization are the result of the UON studies alone. Indeed, this paper is based on a retrospective analysis of the events that made up the complex process of a UON exercise at district-level, in which the first author played a key role. Furthermore, this analysis was never set up in a prospective manner, as indeed in Koutiala, the UON study was primarily used as a health service management tool. Within the limits of this study, however, we believe there are still interesting

points to be made that clarify how such an epidemiological management tool can affect decision-making at district level.

### Inducing changes in relationships

In the above-described process, several elements can be distinguished. First, the type of relationship between the district team (perceived by the hospital staff as essentially administrative) and the hospital staff (perceived by the district team as never-satisfied technicians) changed. Repeated meetings aiming at solving the problem of access to life-saving care modified the mutual perception and this was a crucial factor of motivation for change.

The hospital staff found out that the fastidious work of recording data in registers may turn out to be important when its analysis helps them to identify where problems occur. Indeed, it was seen that the quality of the records improved (more accurate data on origin and more evidence-based diagnosis of complications). Getting the information on origin required the establishment of a dialogue with the patients, which in turn led to better responsiveness: women were no more blamed for delay but asked what obstacles they had met in the process of seeking care. The fact that nurses listened to the story of the obstacle race performed by women and their families to reach the hospital in time contributed to creating a more effective relationship with patients. The staff understood that patients do need their technical competence, but probably benefit from a humane attitude just as much. Health personnel came to appreciate that confidence in the humanity and competence of the hospital may be a strong determinant in the decision to go to the hospital or not.

Also, the relationship between hospital and health centre staff changed. Working in a health centre is traditionally perceived by hospital staff as less prestigious, and this is reflected in staff attitudes. Shared meetings and the need to complement their hospital-based information with information from health centre staff modified the relationship and contributed to creating mutual respect. As a consequence, referral letters were more detailed than before and this improved the effectiveness of the hospital in the management of emergencies and other referrals. A second consequence was that, using figures generated by this common work on unmet need, the health centre staff members were more convincing in increasing the community awareness of the issue of maternal mortality.

### The importance of contextual factors

Healthcare interventions at district level are, in essence, about social interactions that are not occurring in isolation. Therefore, it can be safely assumed that a UON study in itself may be useful, but insufficient in itself to induce change. In this section, we briefly describe the elements of environment, organizational configuration and leadership, key elements in decision-making (Mintzberg et al. 1998), in the setting of Koutiala.

First, the particular configuration of the Mali health system

is an important context-specific element. Since 1990, the health care reform in Mali has aimed at improving the coverage of health care delivery with the truly active involvement of the population in the management of the new facilities. This policy succeeded in uniting providers of care, community representatives and peripheral decision-makers around the same objective. It could be argued, therefore, that the UON study carried out in Koutiala took place in a favourable context. However, if the community associations were already used to managing their own health centres and to having a dialogue with their health personnel, there was not such a dialogue with the health personnel at hospital level. Hospital management was independent from the health centre network management and the hospital staff had little contact with the community, and this is very similar to other districts in Mali.

The organization of shared reflection and consideration with the health centre staff around maternal mortality appears to have been the trigger to a new understanding of the role of the hospital, i.e. that the responsibility of the hospital should go beyond a passive waiting for women in need of hospital care. Such new awareness of responsibility was also observed in Morocco after the same type of experience (Belghiti et al. 1998): the confrontation of the visible part of the iceberg (women managed in hospital) with the underwater part (the real need in the community and hence the unmet need).

A second factor is the composition and the characteristics of the district health team. Leadership and features of team organization obviously contribute to the effectiveness of a UON study as a health service management tool for change. The fact that in the majority of the other districts that were covered by the 1998 retrospective study, the district health teams did not undertake their own UON studies may point to this. In Koutiala, the unique interactive process that a UON exercise entails was taken up by a committed team, and this combination triggered a chain of interventions to tackle the deficits.

### Conclusion

The UON study was implemented in Koutiala district without financial support and only limited external technical back-up. The appropriation of the study by the district team for solving local problems of access to obstetric care may have contributed to the success of the experience. Used as a health service management tool, the study and its results started a dialogue between the hospital staff and both health centre staff and community representatives. This had not only the expected effect of triggering consideration of coverage, but also of quality of obstetric care.

The experience described in this paper does not bring evidence for a causal relationship between the analysis of the unmet need and the reduction of the deficit: the opening of new health centres probably had a more direct effect. However, the UON studies served as a means to initiate essential steps in the improvement of the responsiveness of this district health system.



## Endnotes

<sup>1</sup> This distinction between internal and external researchers is a typical feature of action research methods.

<sup>2</sup> Major obstetric interventions are caesarean section, laparotomy, hysterectomy, craniotomy, embryotomy and internal version.

<sup>3</sup> The absolute maternal indications were limited to the following: severe ante-partum haemorrhage, severe post-partum haemorrhage requiring a hysterectomy, uterus rupture, brow presentation, transverse lie and foeto-pelvic disproportion (including pre-rupture of uterus).

<sup>4</sup> 1.2% (CI 0.97%-1.48%) is the national standard calculated for Mali from studies in urban areas (UON Network 2001).

<sup>5</sup> Fictitious names.

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