

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

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## ***Summary***

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, allowed to estimate that more than 100 women in need of obstetric care never reached the hospital and probably died as a consequence. This surprisingly bad result shocked the district health team and the resulting increased awareness of service deficits triggered operational measures to tackle the obstetric deficits.

The UON 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 expected effect of triggering a reflection on coverage, but also on quality of obstetric care.

## ***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 providing a minimum package of care including essential drugs, on the involvement of the community in the process (aiming at total community ownership) and on 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 operationalisation, 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 (AbouZahr 2001; De Brouwere et al. 1998). This has met with some success, but clearly aggregate national estimates are not sufficient to generate commitment for both local and nation-wide action. Moreover, in developing countries, maternal mortality ratio (MMR) is to be estimated from surveys with confidence intervals too wide to detect statistically significant changes in maternal mortality (UNICEF et al 1997, AbouZahr 1999). This makes MMR a too imprecise measurement to monitor safe motherhood interventions at district level (Graham et al 1996). Process indicators remain thus 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 of society; not all of it can be reduced to failures of health care delivery

systems. A sizeable portion, however, is vulnerable to a more adequate – and more accountable – response of health professionals. These professionals often do not respond adequately either because they do not realise 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 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 toward more accountable behaviour. This approach uses an indicator belonging to the process indicator category aiming at measuring met need for obstetric care (Ronsmans *et al* 2002). Particular about 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 at merely producing data, but considers these data as a means to improve quality of care and of services. Increasing a reflective attitude regarding maternal health status, the UON indicator points health service managers to service deficits that are vulnerable.

The objective of this paper is twofold. The first objective is to show 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. Secondly, this paper aims to show 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 needs (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 has 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 (a health district) (needs) and the actual delivery of these services to this population. (Figure 1)

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

The UON approach emphasizes as much the process of designing the indicator and collecting data, which must be participatory, with the implication of local providers, as the results and their interpretation, which are expected to raise awareness and trigger reaction from health care services management staff. Therefore we report in detail how the data was collected in the next section, which describes 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 bond with the case report.

In a second track, we describe and analyse 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 (ref Yin R 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 is made of the documents and information produced routinely by the health services (meeting minutes, administrative documents, decisions and exchange of information and alike. The fourth source of information is a set of subsequent interviews of the main leader of the exercise in the field. The objective of these interviews was to retrospectively reconstruct the history of the process and the dynamic of 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 leader of the exercise in the field. The analysis of an interview serves as a basis for structuring the next interview. At each stage, the information produced by each interview is systematically confronted with factual elements also gathered and an interpretation of the process is 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.

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

## ***Maternal health in Mali: Context and Background***

### **The Health Care Reform in Mali**

Mali is a large country (1,240,000 sq. km) with a scattered population of around 10 million inhabitants, between 7.5 and 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 15 km of a primary level health facility offering a basic package of activities, and 36% lived within 5 km of such a facility (Ministère de la Santé 1999). 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 ten years.

Until the end of the 1980s, the health services provided a level of service that was 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 health sector in Mali. 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 organisation of the health sector: decentralisation, involvement of the population in the management of health centres and ensuring the availability of essential drugs. This reflection was at the basis of the formulation of the new health policy in 1990 that envisaged to extend the coverage of health services and to improve 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 second 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 direct the attention of the population to the severity of the 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. The decision-makers realised 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 mobilisation 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 hospital (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 an Unmet Obstetric Need 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**

An Unmet Obstetric Need (UON) exercise starts with putting together two pieces of information: an inventory of resources and a mapping of unmet need of 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 that one can get from hospital registers – with a benchmark of minimal needs. The method is extensively described elsewhere (UON Network 1998, UON Network 1999a).

The exercise is restricted to major obstetrical interventions<sup>2</sup> (MOI) for a limited number of maternal indications that are decided upon by a panel of national experts as life-threatening conditions<sup>3</sup>. This is done for two reasons. First, by doing so one must necessarily involve all field professionals (because the indications of each intervention

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<sup>2</sup> MOI are C-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).

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. Second, it allows to aggregate local data and to make meaningful inter-district comparisons, and thus provides elements for priority setting (De Brouwere & 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, the person in charge of the health information system at district level) in the collection and the analysis of data was organised 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 describe how it was implemented by the district team of Koutiala. Koutiala district is located in Sikasso region (south east of Mali), the richest region of Mali. The population of 378,500 inhabitants is mainly rural (75%) and spread over 7,840 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 organised a half-day training on how to perform a UON exercise in Koutiala. This allowed clarifying the concept of absolute maternal indication (AMI) and of

major obstetric intervention (MOI), to explain how to use the data collection form and 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 the year, the Koutiala hospital team decided to start the collection of data prospectively from January 1999. Data gathered concerned all the pregnant women (from the 28<sup>th</sup> week of pregnancy to the 42<sup>nd</sup> day after 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 are 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 Statistiques 2002) and applied on population figures (Table 1).

## **Table 2. Population and births per category of health area, Koutiala, 1998-2001**

### *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 Indication from 1998 to 2001. These rates are calculated separately for rural areas in function of the presence of a functioning health centre. In the urban area (population living within a radius of 15 Km), 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 disposed of a functioning health centre. In the course of 1999, 6 new health centres were opened in the most remote part of the district.

### **Figure 2. Rates of Major Obstetric Interventions for Absolute Maternal Indication according to the category of health areas, Koutiala, 1998-2001**

The first results analysed 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 AMI was compared to 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 MOI for AMI in 1999, Figure 3) and this was interpreted as the number of women who should have benefited from a life saving intervention but actually did not, meaning that they probably died or suffered very severe complications.

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<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)

In 1999, the deficits in rural areas with a functioning health centre were significantly higher, with 23 (40%) missing interventions on the 58 expected, than in 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 health centre and rural areas where a health centre was opened in 1999. However, rural areas with a health centre compared to 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 have happened that a woman with such a life threatening survived. However, other causes such as eclampsia, post-partum/abortion haemorrhage and sepsis were not included.

**Figure 3. Deficits in Major Obstetric Interventions for Absolute Maternal Indication expressed in proportion of missing interventions on expected number**

**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 in how it can affect the dynamics of a district health team. A UON study is logically assumed to increase the 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. 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 the collection of data 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. Rapidly a first formal meeting was organised 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 the future data recording: daily cross-checking of data entered in both the maternity and the operating theatre registers, assigning the responsibility to notify a reliable (evidenced) diagnosis in the operating theatre register to the surgeon, 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, one has to know the exact origin of women 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 one needs to precise which one is the correct one). Listening to the women, the hospital personnel learned about the difficulties met by the families to reach the hospital (roads, money, ...): patients progressively were blamed less and received more attention and empathy. These discussions, originally motivated by the need to collect data, contributed to frame a new type of relationship with the patients and their families. Patients in bed were no more “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 accessibility of care*

The problem solving style of the initial meeting organised 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 C-section kits available at the emergency department so that the woman’s family should be no longer required to buy the equipment outside. The delay to reimburse the C-section kit was extended from 48h after the C-section to 7-10 days and the small material for examination was made available free of charge.

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<sup>5</sup> Fictive names



Later, in collaboration with the health centre heads other actions were implemented. A permanent radio-communication was organised between hospital and health centres in order to decrease the delay when a referral was decided by a health centre. Heads of villages situated in areas without 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 organised.

#### *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 was shocked by the magnitude of the unmet need. They had already guessed that not all women accessed the hospital, but nobody thought it 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 facility by building a new operation theatre, which would be better equipped and more appropriately designed than the old one. The huge deficits were an argument convincing enough for the representative of the Dutch co-operation, which was the major donor in the district, to accept 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 and Koutiala district is not an exception. Indeed, in Mali, 30% of maternal deaths occurring in hospitals are due to haemorrhage (UON Network, 2001). Arguing that these deaths could have been avoided with adequate transfusion facilities, the district team finally received in 2000 the authorisation from the regional authorities to equip the hospital with a blood transfusion

service. Until that moment, 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 needed. Koutiala was the second district hospital in which the 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 3 consecutive years ('98, '99 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 they had calculated that a fair coverage of obstetric need would mean the transfer of only 5 to 6 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 MOI for AMI 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 MOI at Koutiala hospital is practically impossible. There is however a possibility that some of the women underwent a C-section in the neighbour district (Sikasso, the regional capital town), but the access is not easy (150 km from Koutiala) and the cost is higher.

The biggest uncertainty concerns the indication of interventions. Indeed, there is no consensus on what constitutes an AMI (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 organisation 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 an 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 themselves that the fastidious work of recording data in registers may turn out to be important when the 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 of a more affective relationship with patients. The staff understood that patients do need technical competence but probably 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 health hospital or not.

Also the relationship between hospital and the health centre staff changed. Working in a health centre is traditionally perceived by hospital staff as less prestigious and this reflects on staff attitudes as well. Shared meetings and the need to complement their hospital-based information with information of health centre staff modified the relationship and contributed to create mutual respect. As a consequence, referral letters were better filled 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 will briefly describe the elements of environment, organisational 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 aims at improving health care delivery coverage 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 a 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 manage their own health centres and to 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 organisation of a shared reflection with the health centre staff around maternal mortality appears to have been the trigger of 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 organisation 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 a reflection on coverage, but also on 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 diminishing of the deficits: 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.

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**Table 1**

	1998		1999		2000		2001 <sup>†</sup>	
	Population	Expected births	Population	Expected births	Population	Expected births	Population	Expected births
Urban area <sup>‡</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 HC	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>†</sup>Population for 2001 was projected using the 1998-1987 inter-census annual growth rate.

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

Figure 1

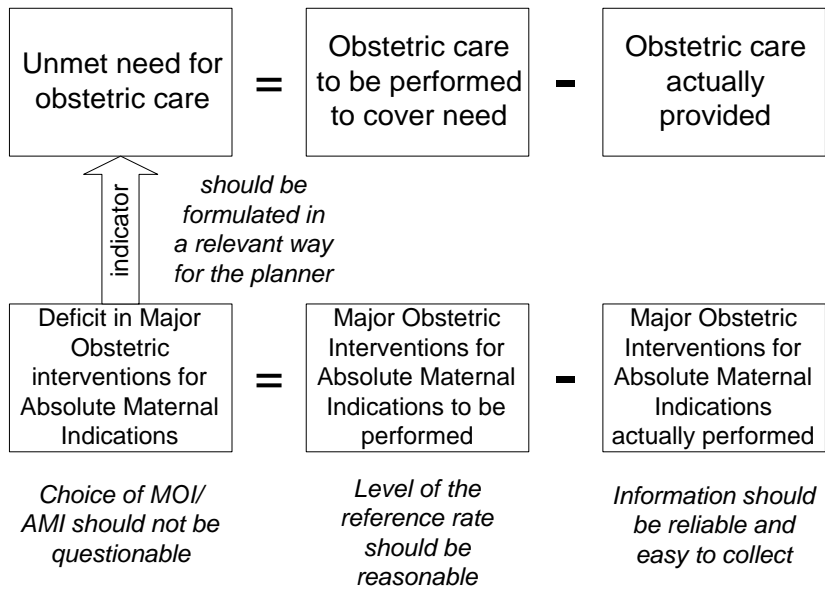


Figure 2

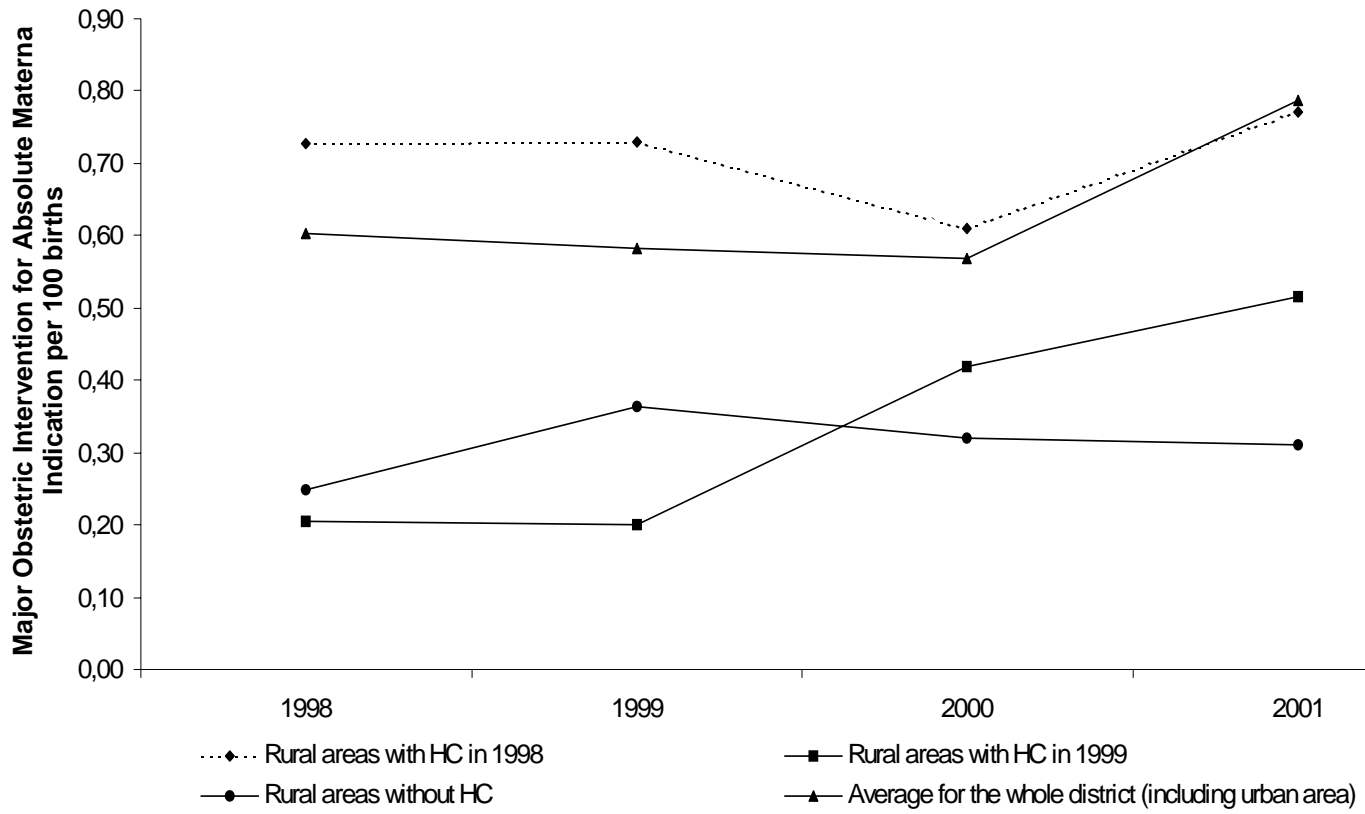


Figure 3

