

Tackling Unmet Needs for Major Obstetric Interventions

Case Studies

Niger

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ABBREVIATIONS

AGCD: Agence Générale de Coopération au Développement (Belgian cooperation)
AMI: Maternal Absolute Indication
BTC: Belgian Technical Co-operation
CAM: Co-ordination and Management Team
CiMéFoR: Circonscription Médicale de Formation et de Recherche (Medical district for formation and research)
CONIPRAT: Comité Nigérien sur les Pratiques Traditionnelles (Committee on traditional practices)
CSI: Centre de Santé Intégré (Integrated Health Centre)
CUN: Communauté Urbaine de Niamey (Urban community of Niamey)
DGCI: Direction Générale de la Coopération Internationale (General directorate of international co-operation)
DH: District Hospital
DHC: Departmental Hospital Centre
DHS: Demographic and Health Survey
DSR: Direction de la Santé de la Reproduction (Reproductive health division)
EB: Expected Births
EU: European Union
GDP: Gross Domestic Product
GNAMASARI: Groupe Nigérien d'Action pour une Maternité sans Risque (Safe motherhood action group of Niger)
GTZ: Gesellschaft für Technische Zusammenarbeit (German co-operation)
IHD: Indicator for Human Development
IMT-A: Institute of Tropical Medicine - Antwerp
MOI: Major Obstetric Intervention
MPH: Ministry of Public Health
NGO: Non-Governmental Organisation
PDS: Plan de Développement Sanitaire (Health Development Programme)
RENFORS: Réseau d'Encadrement National de Formation et de Recherche en Santé (National network for Health Formation and Research)
SNIS: Système National d'Information Sanitaire (National Health Information System)
SOMAIR: Société de Mines de l'Air (Air Mine Society)
SR/PF: Santé Reproductive et Planification Familiale (Reproductive Health and Family planning)
UNDP: United Nations Development Programme
UNFPA: United Nations Population Fund
UNICEF: United Nations Children's Fund
UON: Unmet Obstetric Need
UR: Uterine Rupture
USAID: United States Agency for International Development
WHO: World Health Organisation

1. INTRODUCTION

The UON (Unmet Obstetric Needs) study in Niger is striking in that, although it covers the entire country, it only relates to 14 health structures in 13 of the country's 38 districts¹. Given that only 11 per cent of births take place in a town with a hospital capable of undertaking Major Obstetric Interventions, we expected poor results when looking at deficits (i.e. the difference between met needs and unmet needs). As the anticipated results are more or less known, the aim of this study was certainly not simply to quantify the deficits, but rather to its capacity to mobilise the actors involved in developing the country's health system. The involvement from the outset of the Ministry of Health, and the active support of German technical assistance through the Alafia project ensured the success of the study. However, the process is not entirely finished, as, unfortunately, one of the key phases of the process – structured feedback to the stakeholders – has not yet begun. The feedback scheduled for the end of the study is eagerly awaited by all those involved in the health system, whether they participated in the study or not. The creation of a health policy seems to have been at a standstill for many years, and it would be a shame if Niger does not make use of this opportunity to redynamise its maternal health policy.

In this case study we will set out briefly the country context, which is particularly difficult, given the pervasive poverty and the geographical, setting. We will firstly set out the strategic directions of the Ministry of Health when the UON study began, particularly in the area of maternal health. We will then describe how the study was carried out in Niger. The description of the results differs from the final report in Niger in that we have defined the urban or rural origin of the mother not by using the administrative definition, but by taking into account proximity to a health structure. Another difference that appears in the results comes from the adjustment we have made concerning the fertility differential between urban and rural areas, which had not been taken into account in the analyses made in Niger. Finally, despite the absence of feedback, we will try to understand how the different stakeholders in maternal health perceived the study.

2. CONTEXT

General

Niger is a vast sub Saharan country (1,267,000 sq km) among the poorest on the planet. Its population of 10 million is very young since half the population is under 15. Indicators for health, nutrition and education are among the worst in the world, much lower than the African average: life expectancy at birth of 46, infant mortality rates of 118 per cent and literacy rates of 15 per cent². The situation has even worsened recently with a fall in GDP per head from US\$391 in 1975 to US\$269 in 1997 and then to US\$190 in 1999. According to the UNDP IHD (Indicator of Human Development) Niger today occupies the 173rd place out of 175 (Human Development Report 1997, UNDP).

Independent since 1960, Niger has had a difficult political history over the last few years. In 1996, the third republic was overturned by a coup, and a self-proclaimed president ruled the country. His assassination in April 1999 led to democratic elections, which brought a new president as head of state in November 1999.

Since independence, Niger's health policy has centred on curative health care for the individual. Care was generally free and communities had very little input into the management or financing of health facilities, which are still mainly found in the large towns. In 1974-1976, this policy was reoriented towards a more decentralised approach of a social curative and preventive

¹ Following a modification in the administrative boundaries, there are currently 42 health districts in Niger

² World Bank 1999 World Development Report 1998/99: Knowledge for Development.

health care. In order to achieve this global, integrated health care for the whole community, which would take into account, not only curative care, but also prevention, education and health promotion, the *Projet Amélioration de la Santé Rurale* (1980-1986) (Better Rural Health Project) began to train village health agents. Later, Niger was to sign all the regional and international declarations in which primary health care and maternal and child health care strategies were defined³. But in 1994, having established that the system was not working at an optimal level (insufficient health coverage, irregular drug supply, low levels of coverage of preventive activities, insufficient community participation, poor management of health services...) Niger decided to change its health policy to redress these problems. The *Plan de Développement Sanitaire* (Health Development Plan) of 1994-2000 sets out decentralisation geared towards the development of an operational district level with full community participation supported by the central and departmental level. This plan envisages a pyramid health system on three levels:

- The first level includes: the Health Post (*Case de Santé*) and the village health team, the Integrated Health Centre (IHC) for the rural or urban district, and the District Hospital (DH);
- On the second level: the Departmental Central Hospital Centre (DCH) or a referral maternity facility;
- On the third level: the national hospitals and national centres (the central maternity hospital in Niamey, national centres for family planning, for the fight against leprosy and tuberculosis).

For these three operational levels, there are three administrative levels, the health district, the departmental health directorate, the Ministry of Public Health and its central directorates.

In 2000, there are plans to increase the availability of human and material resources, to extend health coverage so that the percentage of people living within 5 km from a health centre increases from 32 per cent to 45 per cent. This district development plan includes the creation of Health Posts at the village level (run by village health agents) Integrated Health Centres offering a minimum package of activities, and a referral hospital at the district level. The regional and national hospitals are responsible for tertiary health care. In 1998, out of Niger's 38 districts, four have a first level hospital, three a departmental hospital and two referral maternity facilities. In two other districts, private institutions run hospital provision.

Each year the state allows five to six per cent of its budget for health; this is not enough given the country's enormous needs, and the government has to appeal for aid from NGOs and particularly from the large international organisations (UNFPA, UNICEF, the World Bank, WHO, EU).

Maternal Health Policy

Since 1974, Niger has followed regional and international recommendations on this subject. In 1989, the regional meeting on safe motherhood was organised in Niamey. In 1992, the World Bank began to support the Niger's population programme, which aimed to reduce demographic growth by promoting family planning, reducing maternal mortality, and by strengthening women's capacity to participate in the socio-economic development of the country. Among the aims of this programme was to train doctors able to manage dystocia and to construct operating theatres. The World Bank allowed 17.6 million dollars for this programme. However, the health policy in Niger remains oriented towards prevention (antenatal consultation, vaccination, nutrition and family planning) and towards a strategy of meeting obstetric needs through training traditional birth attendants to supervise pregnancies and delivery in rural areas.

³ Lusaka Declaration relating to the Development Scenario in three phases in 1985; the Bamako Initiative in 1987; the World Summit for Children in New York in 1990; the International Conference on Population and Development in Cairo in 1994; the World Summit for Social Development in Copenhagen in 1995; the World Conference on Women in Beijing in 1995; the Regional Strategy on Reproductive Health in Sun City, South Africa in 1997; the Technical Conference on Safe Motherhood, Colombo, 1997

In 1998 a situation analysis revealed the relative failure of this strategy: in every kind of preventive activity coverage remained low, maternal and child mortality remained high, people were insufficiently informed, and there were too few qualified personnel. The gap between modern medicine and traditional health practices only widened, and patients did not feel respected by the midwives, and sometimes even felt insulted by them, for their part the midwives considered the pregnant women ignorant and unwilling⁴.

What is more, the coverage of health facilities capable of managing obstetric emergencies remained just as low. This, combined with unceasing demographic pressure, led Niger to reorient its policy on maternal health and to develop a Declaration of National Policy of Reproductive Health in 1998. In this policy, there are not many changes; the emphasis is still on increasing the health coverage, and of promoting contraceptive usage. For safe motherhood, the accent is on antenatal care, the management of delivery, post partum follow up and family planning.

Maternal mortality is estimated at 700 per 100,000 live births, but this figure dates from the DHS of 1992 and does not seem to have been recalculated. However, in 1990, WHO, on the basis of a new methodology⁵, estimated a number at 1,200 per 100,000 live births. Elsewhere, De Groof et al.⁶ using the sisterhood method estimated maternal mortality in a rural area at 1,050 per 100,000 live births for a period covering the 1980s. Vangeenderhuizen et al.⁷ estimated that the level of mortality was around 450 in Niamey and 1,350 in the rural areas. The MOMA study established a more precise rate of 371 (149-764) per 100,000 live births⁸ in a cohort of pregnant women in Niamey. When the UON study was carried out in Niger, 700 was the figure most widely used. The Demographic Health Survey of 1998 showed that only 44 per cent of births are attended (most often by a 'trained' traditional birth attendant, 40 per cent of cases by a midwife, and 2 per cent of cases by a doctor). The majority of births (81 per cent) take place at home. The policies, which have been promoted for many years, have not been put into practice, with the result that there has been a very low coverage both of skilled attendance at delivery and of facilities capable of managing obstetrical and surgical emergencies. Niger covers a vast area, outside Niamey, there are only 12 hospitals in the country (and two of them are run privately) where obstetrical interventions can be carried out: in these circumstances, essential obstetric needs cannot be met.

⁴ Jaffré Y. and Prual A, 1994 Midwives in Niger: an uncomfortable position between social behaviours and health care constraints, *Soc. Sci. Med.* **38**(8): 1069-1073.

⁵ WHO/UNICEF, 1996 Estimations révisées pour 1990 de la mortalité maternelle, Nouvelle méthodologie

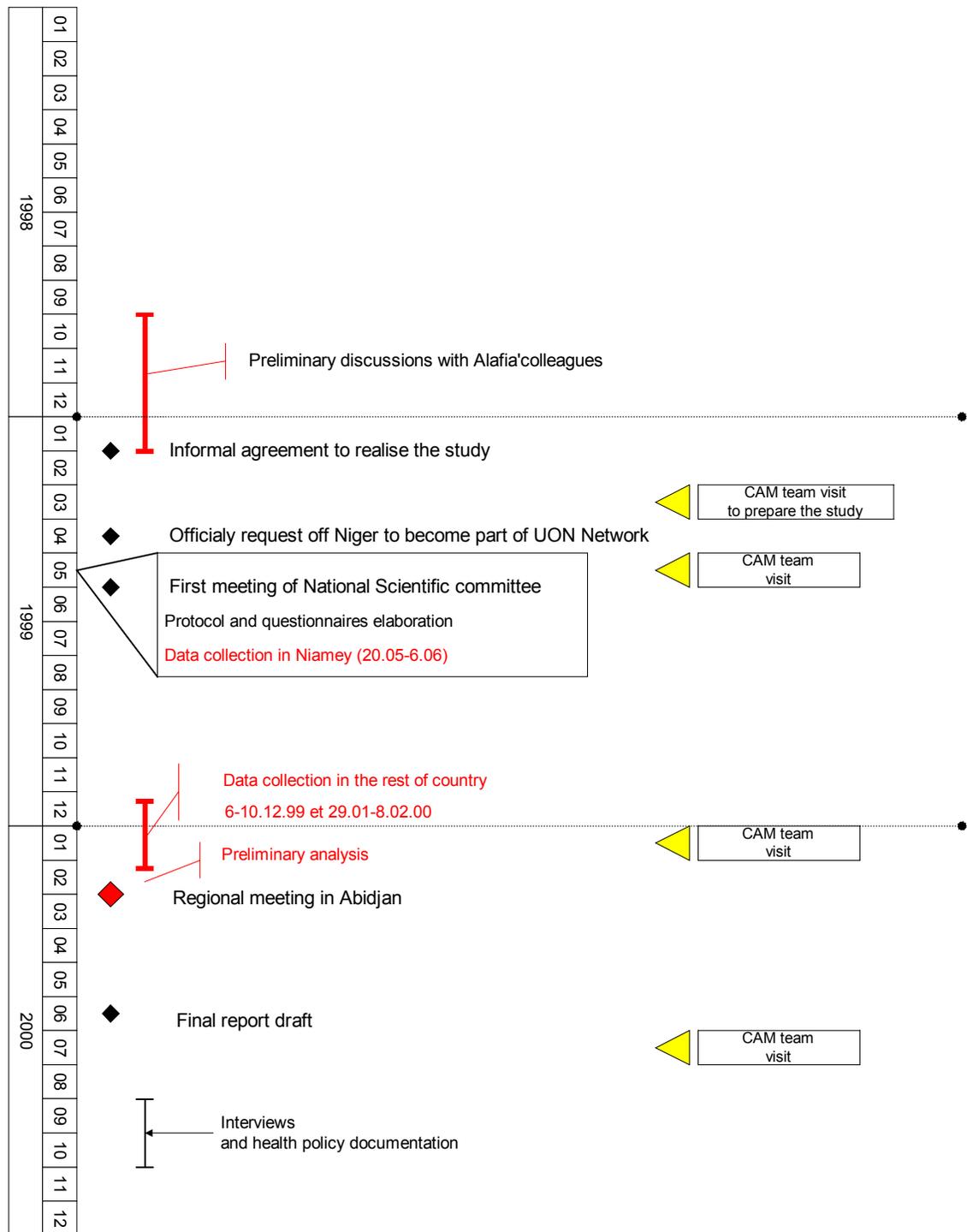
⁶ De Groof D., Seyni Bagnou A., and Sekou H. 1993 [Estimate of maternal mortality in a rural area of Niger: use of the indirect sisterhood method]. *Ann. Soc. belge Med. Trop.* **73**:279-285

⁷ Vangeenderhuysen C., Banos J. -P., and Mahaman T. 1995 Mortalité maternelle évitable en milieu urbain à Niamey (Niger). *Cahiers Santé* **5**:49-54

⁸ Bouvier Colle M. H., Prual A., and de Bernis L. 1998 *Morbidité maternelle en Afrique de l'Ouest*, Paris: Ministère des Affaires Etrangères – Coopération et Francophonie

3. THE UON EXERCISE

Figure 1. CHRONOGAM OF THE UON EXERCISE IN NIGER



Approach to the data collection in hospitals

Data collection began in Niamey on 20 May 1999 and took 16 days. Data collection in the rest of the country was undertaken during two periods: from 6th to 10th December 1999, and 29 January to 8 February 2000. A considerable time elapsed between the two collection periods, due to financial problems: the money (UNICEF funding) intended for the study having been used for a

general assessment of reproductive health needs. It was therefore necessary to contact the potential donors again to release the money necessary to pursue the data collection.

In order to carry out the data collection, the scientific committee first trained the gynaecologists from the departments and the doctors of the districts concerned in Niamey. The researchers were divided into three teams of two people⁹. They then went in teams into the different hospitals and maternity facilities around the country for the data collection. This work took an average of two days per hospital. The Departmental Directorates from the Ministry of Health had a facilitative (administrative) role and themselves provided information on the study to the personnel of the relevant hospitals and maternity facilities. In Niamey, members of the scientific committee carried out the data collection in the capital's facilities.

Equipment and Method

Introduction

The UON study comprises two complementary modules: one is based on a "women" questionnaire analysing the Major Obstetric Interventions, their indications, and the outcome for the women and the children after the intervention; the other module is based on a "health formation" questionnaire which enables the compilation of an inventory of human and material resources at each health facility.

Population studied

This study is retrospective and concerns 1998 data collected in 1999-2000. The population studied was all the women who underwent a Major Obstetric Intervention and/or who died during childbirth or as a result of childbirth.

The expected births by district and by environment (urban and rural) were used to assess the number of women who could be exposed to the risk of undergoing a Major Obstetric Intervention or of dying in the perinatal period. These births have been calculated (**Table 1**) by using the general fertility rate in urban and rural areas (source: DHS 1998). The total population has been estimated by the National Statistical Institute of Niger by projecting the data from the 1988 census. For this purpose, specific growth rates per district were used. There is therefore some differences in the figures between these figures and those published by Niger for expected births (we have 27,959 births in Niamey instead of 32,714 births in the final report from the Ministry of Health), of MOI per AMI expected (1 per cent instead of 0.9 per cent as estimated by the Ministry of Health) and of deficits. The reference rates is similarly slightly modified because we took into account the fact that general fertility rate is lower in urban areas, so the expected births in Niamey are fewer than those calculated by Niger on the basis on the Crude Birth Rate. We preferred to use the general fertility rate rather than the crude birth rate, because it enables us to differentiate between urban and rural areas and it was available for the study year (DHS carried out in Niger in 1998).

⁹ The chairperson of the committee responsible for developing the national programme of reproductive health, a gynaecologist-obstetrician from the Gazobi maternity facility in Niamey who is also teaching at the faculty of health sciences, a paediatrician from the Gazobi maternity facility, a senior technician from the Health Ministry representing the management of reproductive health (DSR) and working at the UNFPA Reproductive Health and Family Planning project, one midwife representing the DSR, Dr Bossyngs from the ALAFIA Project.

Table 1. POPULATION OF REFERENCE BY REGION, NIGER, 1998

Regions	Number of inhabitants	Expected births
Agadez	361,192	19,269
Diffa	217,154	12,663
Dosso	1,476,519	86,856
Maradi	2,033,519	116,763
Tahoua	1,725,404	100,985
Tillabéri	1,882,442	111,751
Zinder	1,961,769	113,231
C.U. Niamey	629,115	27,959
Total	10,287,114	589,477

Referral rate

The reference rate was (re) calculated (**Table 2**) on the basis of MOI per AMI carried out in 1998 in the hospitals and maternity units of Niamey for women from the urban area of Niamey. This calculation has therefore been made on the baseline data collected for the UON study itself. For the 27,959 expected births in the town, the research team registered 296 MOI cases per AMI, i.e. 1.06 per cent.

Table 2. DATABASE FOR CALCULATION OF REFERRAL RATE, NIGER, 1998

	Urban population	Expected births	MOI/AMI performed	Referral rate
Niamey	629,115	27,959	296	1.06%

As explained above, the reference rate calculated on the basis of the number of expected births (EB) differs from the rate used in the final report of the government of Niger (32,714 EB) and gives a slightly higher reference rate (1.06 per cent rounded down to 1 per cent, instead of 0.9 per cent used in the analysis carried out by the scientific committee of Niger).

Criteria for inclusion

The study was included all women of Nigerian nationality who, during 1998, underwent a Major Obstetric Intervention (between the 28th week of pregnancy and the 42nd day post partum), and/or died in a hospital during this period of their pregnancy – whatever the cause of death.

*The variables studied***“Woman” Questionnaire**

This questionnaire enabled the researchers to build up a “woman” file, as a baseline for the analysis of deficits by district (the questionnaire is attached as annex 1). The national research team in collaboration with the trained staff of the Districts and the personnel of the hospital maternity units filled in these questionnaires. Among the variables on the questionnaire, the most significant are:

The name of the health facility.

The district where the facility is situated: according to the administrative divisions in Niger.

The category of formation: Departmental Hospital Centre (DHC), District Hospital (DH), maternity facility.

The district of origin of the mother: the mother gives this information when she is admitted to the hospital. Care has to be taken with this information because it may be that the mother gives an address that is not her permanent address, but a provisional address, usually near the health centre, where she may be living towards the end of her pregnancy.

The area of origin of the mother: urban or rural. In Niger this distinction was made according to the administrative divisions of the country, all women living in a town, whether or not the town possessed a health structure where interventions are carried out, were considered as coming from an urban environment. This data was later corrected in our analysis: only those women living less than 15 km from a hospital capable of carrying out Major Obstetric Interventions were considered as coming from an urban area.

The type of intervention: with the exception of the ligation of hypogastric arteries, which was added to the list of major interventions, the list of interventions is that proposed in the UON protocol.¹⁰

The indication for the intervention: the indications are also the same as those put forward in the UON protocol.

The results for mother: nothing to report, mother died, complication, referred.

The results for child: child born alive and alive on leaving the hospital, stillborn, died within 24 hours of birth.

The time and cause of the mother's death: before, during or after the intervention-infection, haemorrhage, hypertension.

“Health formation” questionnaire

This questionnaire was used to construct a “health formation” file to analyse the human and material resources of each health facility, and to link this information with the “women” file.

Among the variables on this questionnaire, the most important are:

The name of the health facility.

The district where the facility is situated: according to the administrative divisions in Niger.

The category of formation: Departmental Hospital Centre (DHC), District Hospital (DH), maternity facility.

The number of working operating theatres.

The number of gynaecologists and doctors with surgical competence: this includes not only gynaecologists, but also all doctors in the health facility able to perform Major Obstetric Interventions.

The number of midwives and nurses with gynaecological training: this includes all the paramedical personnel able to manage deliveries.

The total number of deliveries.

The number of dystocic deliveries.

The number of caesareans.

The number of uterine rupture.

The material used for the data collection

Concerning **information on individual cases** of Major Obstetric Interventions per Absolute Maternal Indication, the support for the data collection was the “woman” questionnaire

¹⁰ Caesarean, laparotomy, hysterectomy, version extraction, craniotomy

set out in annex 1. A questionnaire was completed for each case recorded according to the criteria.

The sources of information for the “woman” questionnaire included all the documents and registers of the health facility concerning the admission and the intervention carried out.

Concerning **information on the health facilities** (the hospital maternity units, i.e. all the hospitals in which Major Obstetric Interventions were carried out in 1998) the supporting information was the “health formation” questionnaire, set out in annex 2. One questionnaire was completed for each health facility chosen.

Data base

Description of data used

The “women” file

At the outset, the file contained 2,348 cases. After removing 8 duplicates and 20 cases of women who were not Nigerian nationals, the file contained 2,320 cases to be analysed.

Some modifications were made to correct certain errors, and the following cases were not be considered as MOI:

- 18 cases of death before intervention (14 AMI and 4 non-AMI) as they could not be considered as MOI because the women died before any intervention was made.
- 2 (non-AMI) women died at an unrecorded time, one having undergone a uterine curettage for retained placenta, the other for whom the operation and the diagnosis are not known.
- 1 mother who died after an unknown intervention and for an unknown diagnosis (was added to the AMI because she died from a haemorrhage).
- 1 mother died at an unrecorded time, and the type of intervention is not mentioned, but she died from haemorrhage after uterine rupture (case added to the AMI).
- 2 mothers who did not die but for whom the intervention was not known (both were AMI, one foeto-pelvic disproportion and one a brow presentation).
- 1 case where neither the result for the mother nor the type of intervention is known, but where the mother had a haemorrhage through placenta praevia (case added to AMI).

In relation to the original file in which all the cases were MOI, there are now only 2,295 MOI. In the original file there were also 1,377 AMI and 943 non AMI and a correction has been made because, in addition to the three deaths mentioned above, one case of transverse lie and two cases of foeto/pelvic disproportion had not been considered as AMI.

After these corrections, we decided to eliminate two contentious cases for which the intervention shown was an internal version, while the indications were placenta praevia and retro-placental haematoma. It is impossible on the basis of the data on the file to know with these two cases whether the error was in the type of intervention or the indication. The final total is 2,293 MOI and 1,381 AMI (of which 1,362 MOI are for AMI).

The definition of urban and rural used by Niger for this study is purely administrative and does not take account of the distance from a health facility practising operations. Nevertheless, we can partially correct the mother’s home milieu by only considering as urban those women who live in a town where one of the facilities in the study is situated. All women from districts that do not have a functioning hospital will be considered as coming from the rural area (Bilma, Maïné-Soroa, N’guimi, Boboye, Douchi, Aguié, Dakoro, Guindan-Roundji, Madarounfa, Mayahi, Bouza, Illéla, Keita, Madaoua, Tchinta-Abalak, Finningué, Kollo, Ouallam, Say, Tillabéri, Gouré, Magaria,

Mataméyé, Mirriah, et Tanout). All women coming from the towns of Niamey, Maradi and Zinder are of urban origin.

Some unresolved problems remain for certain variables, some missing information (not encoded in the file) or not mentioned (where the source register did not give the information). **Table 3** below gives a resume of these unresolved problems.

Table 3. MISSING AND UNRECORDED DATA IN THE "WOMEN FILE", NIGER, 1998

Total number of cases

Variable	Data					
	Missing		Not noted		Total	
	Number	(%)	Number	(%)	Number	(%)
Whole file (2.318 records)						
Type of area			101	4.4%	101	4.4%
Indication	21	1.0%	16	0.7%	37	1.6%
Type of intervention	6	0.3%			6	0.3%
Results for child	52	2.2%	8	0.3%	60	2.6%
Results for mother	137	6%			137	6%
Mother's death (105 cases)						
When mother died	5	4.8%	2	1.9%	7	6.7%
Cause of mother' death	12	11.4%	2	1.9%	14	13.3%

The Major Obstetric Interventions for Absolute Maternal Indications

Variable	Data					
	Missing		Not noted		Total	
	Number	(%)	Number	(%)	Number	(%)
Whole file (1.362 records)						
Type of area			44	3.2%	44	3.2%
Results for child	7	0.5%	7	0.5%	14	1%
Results for mother	78	5.7%			78	5.7%
Mother's death (70 cases)						
When mother died	3	4.3%	1	1.4%	4	5.7%
Cause of mother' death	5	7.1%	1	1.4%	6	10%

The most important problems are those concerning the outcome of the intervention for the mother, which is missing in 6 per cent of cases. The time of death and the cause of death are poorly registered since this information is missing in, respectively, six and 10 per cent of deaths following an MOI for an AMI.

The final file of 2,318 cases is summarised in **Table 4** that divides the type of interventions by the type of diagnosis.

Table 4. DISTRIBUTION OF CASES ACCORDING TO CATEGORY OF INTERVENTION AND CATEGORY OF INDICATION, NIGER, 1998

		AMI		
		Yes	No	Total
MOI	Yes	1.362	931	2.293
	No	19	6	25
Total		1.381	937	2.318

The "health formation" file

This file contains the data on the 14 health facilities involved in the study. Among these facilities, there are 4 Departmental Hospital Centres, 4 District Hospitals, 4 Maternity Hospital, two of which are in Niamey, and 2 private hospitals. Except for the absence of information concerning the number of caesareans and cases of uterine rupture in the response of the Poudrière maternity hospital, all the essential information has been supplied for each facility. The questionnaires relating to each of these health facilities were filled in on the same dates and by the same researchers as the "woman" questionnaire.

Reconciliation of data from the "woman" and "health formation" questionnaires

One questionnaire was filled in for each of the facilities participating in the study. The data (particularly the number of caesareans carried out and the number of cases of uterine rupture admitted) correspond relatively well with those in the "woman" file. The differences observed in the pre-correction numbers are explained in part by the omission of cases of non-Nigerian women, and the omission of two cases where the intervention and the indication were incompatible, and in part by the modifications concerning the removal of cases from the category of MOIs.

Discussion of Biases

"Demographic" biases

The statistics from the census of 1988 have been used to project the estimated population. These old figures are the only ones available, and it is difficult to estimate the bias caused by the age of the figures. Using the General Fertility Rate according to the setting (201 per cent in urban areas and 271 per cent in rural areas) is a better way of understanding the differing fertility rates between the urban and rural areas. However, there are still possible errors in the estimate of expected births, by the estimate of the proportion of women of procreating age (DHS 1988: 43.1 per cent in urban areas and 41.9 per cent in rural areas), or because the differing fertility rates according to the region and the age of the mother was, not taken into account. The data that would have allowed a more precise estimate of expected births was not available.

Biases due to inexact diagnosis

The fact that there are no gynaecologists in the hospitals of Loga, Gaya, Tera and Tessaoua districts, and in the two private hospitals could have been a handicap to accurate diagnoses. However, in order to limit these errors, the data collection team included experienced gynaecologists.

Biases in collection of data

The most important bias concerns the definition of urban area and rural area used in Niger. Because the proximity to a health facility capable of carrying out interventions was not taken into account, the urban area does not correspond to the definition in the UON protocol. The denominator "expected births" according to the setting can easily be corrected by only considering as urban areas those towns that have a functioning health facility. By contrast, the correction for the numerator "number of MOI/AMI carried out" cannot take into account the bias that occurs in the mother's declaration of her domicile at the time of admission. If mothers declare a temporary residence in town, there may be an over estimate of cases from urban areas. It is not possible to control for this bias in the 1998 study, but it can be avoided in the future by paying more attention to the data obtained when the mother is admitted.

Results

To begin with, we will simply describe the global results concerning the distribution by district of interventions, indications and deficits. Then there will be a more specific analysis to try to pull out any differences that may exist between different settings to try to grasp the levels and causes of maternal and infant mortality, and finally to link this data with the information obtained in the “health formation” questionnaires.

The tables, graphs and maps below are based on the categories set out in **Table 4**. Our interest lies in the Major Obstetric Interventions (2,293 cases) whatever the indication, and the Absolute Maternal Indications (1,381 cases) and Non Absolute (937 cases). In the analyses according to area (urban – rural), the women whose area of origin is not known are most often omitted. They make up about three per cent of the cases of MOI for AMI.

The Major Obstetric Interventions

A total of 2,293 Major Obstetric Interventions were registered in 1998 (**Table 4**). This represents a national average rate of 0.4 MOI per 100 expected births. There is a clear disparity between settings: the average rates are 1.3 in the urban areas and 0.3 in rural areas. A “contamination” in the urban setting of women who are really from the rural areas is one possible explanation for this disparity, but this hypothesis is nevertheless not sufficient to explain the high levels of deficits in both the urban and rural areas. (**Table 10** and **Table 11**).

Table 5. MAJOR OBSTETRIC INTERVENTIONS ACCORDING TO TYPE OF INTERVENTION AND AREA, NIGER, 1998

	Urban area		Rural area		Unknown area		Total	
	Number	%	Number	%	Number	%	Number	%
C-section	872	87.1%	872	73.20%	82	82%	1,826	79.6%
Hysterectomy	3	0.3%	31	2.6%	3	3%	37	1.6%
Laparotomy	79	7.9%	187	15.7%	11	11%	277	12.1%
Version and extraction	32	3.2%	47	3.9%	4	4%	83	3.6%
Craniotomy	15	1.5%	55	4.6%			70	3.1%
Total	1,001	100%	1,192	100%	100	100%	2,293	100%

Caesareans represent 87 per cent of interventions in the urban areas and 73 per cent in the rural areas, while laparotomies (most often for uterine repair) represent only 8 per cent of the interventions in rural areas against 16 per cent in the rural areas. This probably indicates a delay in admitting women in rural areas.

The rate of caesareans per 100 Expected Births is 1.3 in urban areas (1.9 in Niamey) and 0.2 in the rural areas. The urban rate differs considerably from the rate set out in the DHS 1998¹¹ (caesarean rate/100 Expected Births: 2.1 for urban areas and 2.7 for Niamey) this is mostly because the DHS uses the 1997 data for the urban population and in particular that of Niamey. Using the population data of 1997 in the results of the UON study would give us a caesarean rate of 2.5/100 expected births in Niamey which is close to the rate in the DHS. Incidentally, the DHS relies on the mother’s report of the intervention carried out, so it is possible that the number of caesareans may be overestimated as laparotomies and hysterectomies may be reported as caesareans by the women questioned.

¹¹ CARE International, Niger, Demographic and Health Surveys, Macro International Inc. 1998. Enquête Démographique et Santé, Niger.

Women who have not had an Major Obstetric Intervention

There are 25 such cases, 19 AMI and 6 Non-AMI; 22 mothers died before or after the intervention, three did not die, but the indication was an AMI.

Absolute maternal indications

There were a total of 1,381 absolute maternal indications (60 per cent) out of the total number of registered cases. Foeto-pelvic disproportions are the main indications (36 per cent) for a Major Obstetric Intervention; there are a few more in the urban areas (39 per cent) than in the rural areas (35 per cent) (**Table 6**). If we add the cases of uterine rupture and abnormal presentations, then problems linked to obstructed labour make up 75 per cent of the major interventions. This proportion is high whatever the setting: 68 per cent in urban areas and 79 per cent in rural areas. Cases of uterine rupture occur twice as often in rural areas, which indicates a delay in managing these urgent cases, probably due to the inaccessibility of the health facilities, for whatever reason (financial. geographic. cultural...).

Table 6. ABSOLUTE MATERNAL INDICATIONS ACCORDING TO TYPE OF AREA, NIGER, 1998

	Urban area	Rural area	Unknown area	Total
	Number (%)	Number (%)	Number (%)	Number (%)
Uterine rupture	59 11.5%	205 24.9%	12 27.3%	276 20%
Transverse. facial and front presentation	88 17.1%	163 19.8%	7 15.9%	258 18.7%
Foeto-pelvic disproportion and pre-rupture	202 39.2%	285 34.7%	13 29.5%	500 36.2%
Ante-partum haemorrhages	163 31.7%	160 19.5%	11 25%	334 24.2%
Post-partum haemorrhages	2 0.4%	7 0.9%	1 2.3%	10 0.7%
Severe haemorrhages	1 0.2%	2 0.2%		3 0.2%
Total	515 100%	822 100%	44 100%	1,381 100%

Ante-partum haemorrhages are much more frequent in urban areas. It is very likely that women from rural areas with serious haemorrhage do not have the time to get to hospital and die at home or on the way to hospital.

Non-Absolute maternal indications

For almost all these indications, the mother has benefited from a Major Obstetric Intervention. In most of the cases, it was a caesarean (93% of the cases). Only six women were subjected to another type of intervention or died before benefiting from any surgical intervention. In these cases, the indication of the intervention is not mentioned in the "woman" file. **Table 7** and **Table 8** present the Non-Absolute Maternal Indications only an for woman who were subjected to a Major Obstetric Intervention and does not take into account medical treatments which are often sufficient to take care of this kind of problems. Non-progressing labour, eclampsia and a history of caesareans are the most frequent Non-Absolute Maternal Indications (**Table 7**).

Table 7. NON-ABSOLUTE MATERNAL INDICATIONS ACCORDING TO TYPE OF AREA, NIGER, 1998

	Urban area		Rural area		Total	
	Number	(%)	Number	(%)	Number	(%)
Dynamic dystocia	138	29%	100	26%	247	27%
Eclamsia	105	22%	66	17%	185	20%
Antecedent of C-section	99	21%	88	23%	202	22%
Foetal distress	48	10%	35	9%	89	10%
Complications connected with cord	22	5%	19	5%	41	4%
Extra-uterine pregnancy	20	4%	11	3%	31	3%
Breach presentation	11	2%	23	6%	37	4%
Obstructed labor for other cause	9	2%	8	2%	20	2%
Obstructed labor for other presentation	8	2%	14	4%	23	3%
Other obstetrical antecedent	5	1%	8	2%	14	2%
Genital malformation	4	1%	2	1%	6	1%
Other cause	2	0%	10	3%	12	1%
Vaginal haemorrhage	2	0%			2	0%
Mother's medical problem	1	0%			1	0%
Prophylactic C-section					1	0%
Puerperal infection			1		1	0%
Not mentioned	6	1%	4	1%	13	1%
Total	480	100%	389	100%	925	100%
Missing value	11	2%			12	1%
Total	491		389		937	

* This total includes 58 cases where the mother's area of origin is unknown

There appears to be little difference between the urban and rural settings. If we calculate the incidence rates for each of the interventions against the expected births, (**Table 8**) we can see that ectopic pregnancies and eclampsia are respectively 14 and 12 times more frequent as indication for MOI in the urban areas. This may be explained by the rapidly fatal nature of these pathologies. Women living in rural areas do not have time to get to a health facility and probably die before any management of their case.

Table 8. NON-ABSOLUTE MATERNAL INDICATION RATIO OF URBAN RATES TO RURAL RATES, NIGER, 1998

Indication	Urban rate (‰ EB)	Rural rate (‰ EB)	Ratio U/R
Genital malformation	0.060	0.004	16
Extra-uterine pregnancy	0.300	0.021	14
Eclampsia	1.574	0.126	12
Dynamic dystocia	2.069	0.191	11
Foetal distress	0.720	0.067	11
Complications connected with cord	0.330	0.036	9
Obstructed labor for other cause	0.135	0.015	9
Antecedent of C-section	1.484	0.168	9
Other obstetric antecedent	0.075	0.015	5
Obstructed labor for other presentation	0.120	0.027	4
Breach presentation	0.165	0.044	4
Vaginal haemorrhage	0.030		
Mother's medical problem	0.015		
Prophylactic C-section	0.000		
Puerperal infection			
Not mentioned	0.09	0.008	12
Other cause		0.019	0

All the non-absolute maternal indications are more represented in the urban areas, including indications such as foetal distress or problems linked to the umbilical cord where the

infant's life, not the mother's is endangered. In urban areas then, interventions to save the baby's life are carried out more often. This difference may be due to the fact that women in the rural areas do not go to a health facility unless their life is really at risk or where a precise diagnosis concerning the baby's health or their own health has been identified, which is rare given the low level of qualification of the birth attendants. Furthermore, it may be that doctors in rural areas hesitate more before undertaking a major intervention when the mother's life is not in danger.

Major Obstetric Interventions for Absolute Maternal Indication

Table 9. TYPE OF INTERVENTION ACCORDING TO TYPE OF INDICATION AND AREA. NIGER, 1998

Urban Area

	C-section	Hysterec tomy	Laparo tomy	Version extraction	Cranio tomy	Unknown type of intervention	Total	Mother died before intervention
Uterine rupture		2	56				58	1
Transverse. facial and front presentation	58			27	2	1	88	
Foeto-pelvic disproportion and pre-rupture	189				12		201	1
Ante-partum haemorrhage	162		1				163	
Post-partum haemorrhage		1	1				2	
Severe haemorrhage						1	1	
Total	409	3	58	27	14	2	513	2

Rural Area

	C-section	Hysterec tomy	Laparo tomy	Version extraction	Cranio tomy	Unknown type of intervention	Total	Mother died before intervention
Uterine rupture		25	172			1	198	7
Transverse. facial and front presentation	110		1	40	11		162	1
Foeto-pelvic disproportion and pre-rupture	252				32	1	285	
Ante-partum haemorrhage	156		1			1	158	2
Post-partum haemorrhage		6					6	1
Severe haemorrhage			1				1	1
Total	518	31	175	40	43	3	810	12

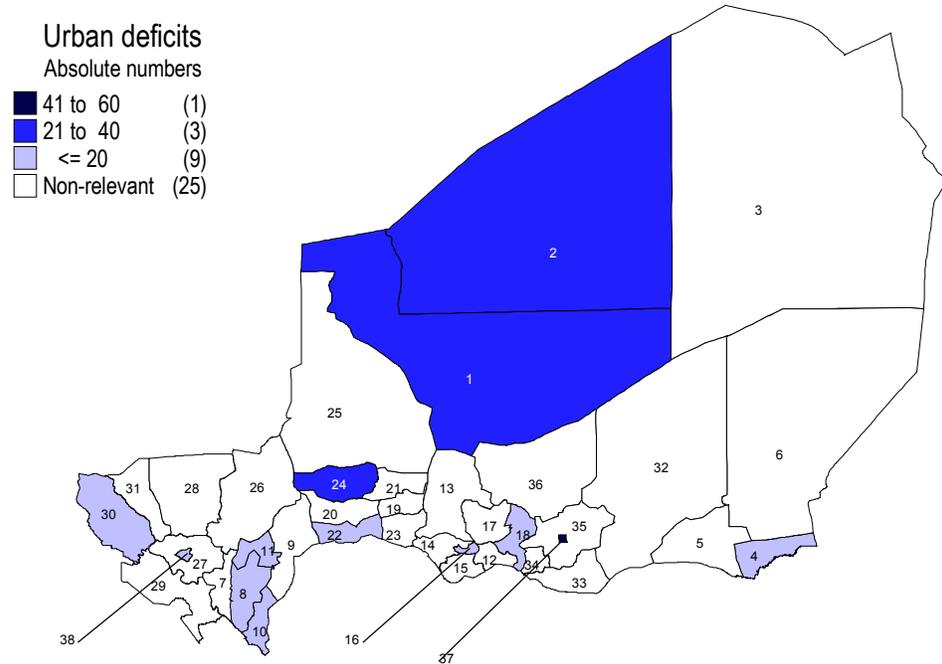
The 44 cases in which the mother's place of residence is unknown should be added to these two tables.

The rate of MOI/AMI is 0.77 per 100 Expected Births in the urban areas and 0.15 per 100 EB in the rural areas, therefore 5 time higher in the urban area. The difference in the caesarean rate between settings is even greater since it is seven times higher in the urban area (1.3 MOI/100 EB against 0.2 in the rural areas). Hysterectomies represent less than 1 per cent of the MOI/AMI in the urban area against almost 4 per cent in the rural area, which shows the seriousness of the foeto-pelvic disproportion when these women arrive in a hospital.

Deficits in urban area

In absolute terms the deficits in urban area are fairly minor (**Figure 2**) except for the urban community of Zinder (42 cases). However, the towns concerned are not highly populated and the number of expected cases is fairly low except in Niamey and in the town of Maradi.

Figure 2. DEFICITS IN MAJOR OBSTETRIC INTERVENTIONS FOR ABSOLUTE MATERNAL INDICATION, URBAN AREA, NIGER, 1998



The numbering of the Districts refers to **Table 10**

Table 10. DEFICITS IN MAJOR OBSTETRIC INTERVENTIONS FOR ABSOLUTE MATERNAL INDICATION BY DISTRICT, URBAN AREAS, NIGER, 1998

Region	N°	District	Expected births	MOI for AMI		Deficits	
				Expected	Performed	Number	(%)
AGADEZ	1	AGADEZ/TCHIRO	3,035	27	11	16	60%
	2	ARLIT	3,522	32	12	20	62%
	3	BILMA	Non-relevant				
DIFFA	4	DIFFA	761	7	2	5	71%
	5	MAINE-SOROA	Non-relevant				
	6	N'GUIMI	Non-relevant				
DOSSO	7	BOBOYE	Non-relevant				
	8	DOSSO	1,736	16	8	8	49%
	9	DOUTCHI	Non-relevant				
	10	GAYA	950	9	5	4	42%
	11	LOGA	255	2	1	1	56%
MARADI	12	AGUIE	Non-relevant				
	13	DAKORO	Non-relevant				
	14	GUIDAN ROUMDJI	Non-relevant				
	15	MARADOUNFA	Non-relevant				
	16	MARADI	11,230	101	112	-11	-11%
	17	MAYAHI	Non-relevant				
	18	TESSAOUA	1,255	11	7	4	38%
TAHOUA	19	BOUZA	Non-relevant				
	20	ILLELA	Non-relevant				
	21	KEITA	Non-relevant				
	22	KONNI	1,817	16	16	0	2%
	23	MADAOUA	Non-relevant				
	24	TAHOUA	3,131	28	11	17	61%
TILLABERI	25	TCHINTA/ABALAK	Non-relevant				
	26	FILINGUE	Non-relevant				
	27	KOLLO	Non-relevant				
	28	OUALLAM	Non-relevant				
	29	SAY	Non-relevant				
	30	TERA	749	7	0	7	100%
	31	TILLABERI	Non-relevant				
ZINDER	32	GOURE	Non-relevant				
	33	MAGARIA	Non-relevant				
	34	MATAMEYE	Non-relevant				
NIAMEY	35	MIRRIAH	Non-relevant				
	36	TANOUT	Non-relevant				
	37	ZINDER	10,310	93	51	42	45%
	38	NIAMEY	27,959	252	274	-22	-9%
		Total	66,710	600	511	89	15%

The total MOI/AMI observed includes the cases for which the mother's district of origin is unknown
 Non-relevant: according to our definition of urban population, there is no urban population in these districts

The negative values in **Table 10** are probably due to the cross contamination of data for the urban setting by women who are really from the rural areas.

In relative deficits, only four hospitals seem to fulfil their mission of managing obstetric emergencies satisfactorily. These are the departmental hospital of Maradi, the private hospital in Konni and the two maternity units in Niamey. For the others, the relative deficits vary from 38 per cent in Tessaoua to 100 per cent in Tera. In six of the towns concerned, these deficits are above 50 per cent. The hospital in Tera seems to be almost completely non-functioning; as we will see later, very few deliveries are managed there. Of the 22 women from the district of Tera (of whom only one is from the town) who have undergone a MOI – for whatever indication – 14 including the resident from the town of Tera itself, preferred to go the Gazobi maternity unit in Niamey. The

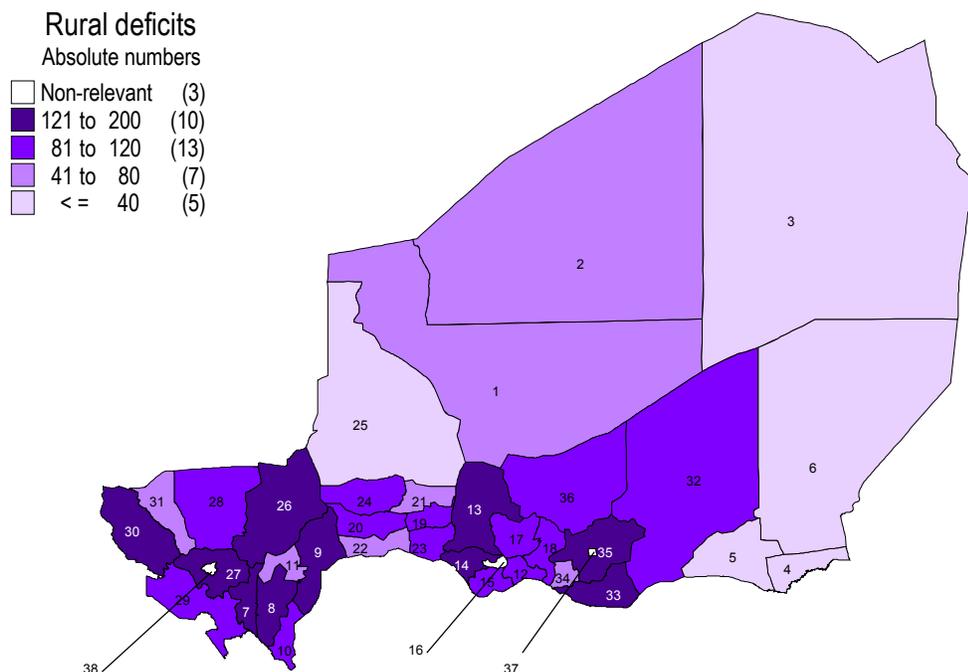
hospital in Dosso does not seem to be working well either. However, this hospital has existed for a very long time and expatriate doctors have been working there for years. This needs a closer analysis.

However, the population of the towns has easy geographic access to all these facilities, which contain the human and material resources necessary to manage obstetric emergencies. Among the numerous possible explanations for the lack of recourse to hospitals in cases of serious obstetric problems, the attitude of the paramedical personnel and the persistence of traditions that are in contradiction to the techniques of modern medicine¹² are essential factors.

Deficits in rural area

Except for the sparsely populated areas where the number of MOI/AMI cases expected gets close to 40, all the rural areas have a high absolute deficit (**Figure 3**). In relative terms, most districts are above 75 per cent (**Table 11**). The only exceptions are Konni, where there is a private hospital, Madaoua, which is also near that hospital, and Matameye, which is not far from Zinder where there is a large regional hospital. The coverage of relatively small rural areas which are not too far from hospitals, such as Kollo, Illela, Tessaoua or even Aguié, does not seem much better than areas which are far removed from any facility. Loga, the only district that has a network of radio communication and an ambulance, also has very high deficits. The presence of resources capable of evacuating emergency cases seems ineffective if it is not linked to a structure that involved the community.

Figure 3. DEFICITS IN MAJOR OBSTETRIC INTERVENTIONS FOR ABSOLUTE MATERNAL INDICATION, RURAL AREA, NIGER, 1998



The numbering of districts refers to **Table 11**

¹² Jaffré Y., Prual A, 1993 "Le corps des sages-femmes", entre indentités professionnelle et sociale, *Sciences Sociales et Santé*, Vol XI, no. 2, pp64-80.

Vangeenderhuysen Ch., Olivier de Sardan JP, Moumouni A., Aboucar S. 1998 A propos de quelques pratiques obstétricales populaires au Niger, *Cahiers Santé*, 8, pp265-8.

Vangeenderhuysen Ch., Banos JP., Mahaman T. 1995 Mortalité maternelle évitable en milieu urbain à Niamey (Niger), *Cahiers Santé*, 5, pp 49-54.

Table 11. DEFICITS IN MAJOR OBSTETRIC INTERVENTIONS FOR ABSOLUTE MATERNAL INDICATIONS BY DISTRICT, RURAL AREAS, NIGER, 1998

Region	N°	District	Expected births	MOI for AMI		Deficits	
				Expected	Performed	Number	(%)
AGADEZ	1	AGADEZ/TCHIRO	6,714	60	0	60	100%
	2	ARLIT	5,363	48	1	47	98%
	3	BILMA	635	6	1	5	83%
	4	DIFFA	4,835	44	8	36	82%
DIFFA	5	MAINE-SOROA	5,428	49	7	42	86%
	6	N'GUIMI	1,639	15	3	12	80%
	7	BOBOYE	17,451	157	11	146	93%
DOSSO	8	DOSSO	19,384	174	19	155	89%
	9	DOUTCHI	26,920	242	35	207	86%
	10	GAYA	12,787	115	19	96	84%
	11	LOGA	7,373	66	12	54	82%
	12	AGUIE	13,965	126	27	99	79%
	13	DAKORO	21,662	195	23	172	88%
	14	GUIDAN ROUMDJI	18,372	165	20	145	88%
MARADI	15	MARADOUNFA	15,631	141	23	118	84%
	16	MARADI	Non-relevant			Non-relevant	
	17	MAYAHI	18,040	162	26	136	84%
	18	TESSAOUA	16,607	149	32	117	79%
	19	BOUZA	13,504	122	15	107	88%
	20	ILLELA	13,597	122	23	99	81%
	21	KEITA	11,695	105	14	91	87%
TAHOUA	22	KONNI	18,875	170	73	97	57%
	23	MADAOUA	17,963	162	54	108	67%
	24	TAHOUA	15,968	144	22	122	85%
	25	TCHINTA/ABALAK	4,435	40	5	35	88%
	26	FILINGUE	22,867	206	14	192	93%
TILLABERI	27	KOLLO	23,842	215	37	178	83%
	28	OUALLAM	14,770	133	21	112	84%
	29	SAY	15,684	141	28	113	80%
	30	TERA	23,128	208	14	194	93%
	31	TILLABERI	10,711	96	13	83	87%
ZINDER	32	GOURE	13,359	120	13	107	89%
	33	MAGARIA	27,051	243	56	187	77%
	34	MATAMEYE	13,677	123	35	88	72%
	35	MIRRIAH	34,290	309	66	243	79%
NIAMEY	36	TANOUT	14,544	131	17	114	87%
	37	ZINDER	Non-relevant			Non-relevant	
	38	NIAMEY	Non-relevant			Non-relevant	
Total			522,766	4,704	807	3,898	83%

The total MOI/AMI observed includes those cases where the mother's district of origin is not known.

Non-relevant: only urban population, according to our definition of urban and rural areas

No hospital claims to provide good coverage in the rural area, All of them possess a working ambulance, but this is clearly not sufficient if there is no viable way of communicating with the health centres, and if no system for evacuating emergency cases is put in place. The only hospital that seems to "attract" patients is the private hospital in Konni.

*Uterine ruptures***Table 12.** UTERINE RUPTURE: TYPES OF INTERVENTION AND NUMBER OF MATERNAL DEATHS ACCORDING TO TYPE OF AREA, NIGER, 1998

	Urban area		Rural area		Total**	
	Number	Deaths	Number	Deaths	Number	Deaths
Hysterectomy	2	0	25	5	30	5
Laparotomy	56	6	172	22	237	29
Mother died before intervention	1	1	7	7	8	8
Total	59	7	205	34*	275	42*

* This total do not include one case for which the type of intervention is not known

** Includes cases where the mother's district of origin is unknown (12 cases)

Uterine rupture accounts for 12 per cent of the absolute maternal indications in the urban area, and 25 per cent in the rural area (**Table 6**), and what is more, in the rural area 12 per cent of these ruptures require a hysterectomy against 3% in urban area. This shows that in the rural area the delay in deciding to go to a health facility increases the seriousness of obstetric emergencies.

This is also shown in **Table 13** below. We can see that 53 per cent of intra-hospital deaths follow on from a uterine rupture in rural areas as opposed to 37 per cent in urban areas.

*Intra-hospital maternal deaths***Table 13.** INTRA-HOSPITAL MATERNAL DEATHS ACCORDING TO INDICATIONS (MOI AND NON-MOI), NIGER, 1998

	Urban area		Rural area	
	Number	(%)	Number	(%)
Uterine rupture	7	37%	35	53%
Transverse, facial and front presentation	4	21%	9	14%
Foeto-pelvic disproportion and pre-rupture	3	16%	11	17%
Anter-partum haemorrhage	4	21%	8	12%
Post-partum haemorrhage			1	1%
Sever haemorrhage	1	5%	2	3%
Total	19	100%	66	100%

Does not include one case of uterine rupture for which the type of area is unknown

The 19 deaths observed in the urban areas represent 4 per cent of the absolute maternal indications while in the rural areas, eight per cent of women who present with an AMI die in hospital (**Table 6**). In the urban areas the deaths are mainly following a caesarean, while in the rural areas 44 per cent of deaths follow a laparotomy and 10 per cent follow a hysterectomy (**Table 14**) both of these operations are mostly carried out for uterine rupture.

Table 14. INTRA-HOSPITAL MATERNAL DEATHS ACCORDING TO TYPE OF INTERVENTION FOR ABSOLUTE MATERNAL INDICATIONS AND ACCORDING TO TYPE OF AREA, NIGER, 1998

	Urban area		Rural area	
	Number	(%)	Number	(%)
C-section	9	56%	24	45%
Hysterectomy			5	9.5%
Laparotomy	6	38%	23	43.5%
Version and extraction	1	6%		
Craniotomy			1	2%
Total	16	100%	53	100%

Does not include 14 women who died before any interventions and 2 women for which the type of intervention is unknown.

Major obstetric interventions are also carried out for non-absolute obstetric indications. The most common of these are non-progressing labour, eclampsia and a history of caesarean, which make up 70 per cent.

Table 15. MATERNAL DEATHS AFTER MOI ACCORDING TO GROUP OF INDICATIONS (AMI AGAINST NON-AMI) AND TO TYPE OF AREA, NIGER, 1998

	AMI			Non-AMI		
	Number of MOI	Number of deaths	(%)	Number of MOI	Number of deaths	(%)
Urban	511	16	3.1%	490	6	1.2%
Rural	807	53	6.6%	385	8	2.1%
Unknown	44	1	2.3%	56	1	1.8%
Total	1,362	70	5.5%	931	15	1.6%

Maternal mortality after an intervention for a non-absolute maternal indication is also higher in the rural areas, although the gap is slightly less than for deaths, where there is an Absolute Maternal Indication. The number of cases of non-AMI is too low to analyse. As for the AMI, 46 per cent of deaths in the urban area as well as the rural area are due to a haemorrhage, usually occurring after the intervention.

Globally, four per cent of women undergoing an MOI die during or after the intervention. As is logical, these deaths are more frequent if the operation has been carried out because of an Absolute Maternal Indication (5.5 per cent of deaths), than if the indication was not absolute¹³ (1.6 per cent of deaths). This difference in the risk of dying according to the type of area is statistically significant for AMI but not for non-AMI¹⁴.

Child deaths

In the rural areas, 45 per cent of infants die (stillborn or died within 24 hours) when their mother has undergone an MOI – among which 85 per cent are carried for an AMI (Table 16). In the urban area, early perinatal deaths are less frequent, the rate does not reach 20 per cent of newborns, but another 5 per cent of the newborns will die after 24 hours against 1 per cent in rural areas.

¹³ Chi-square = 18 p<0.000.

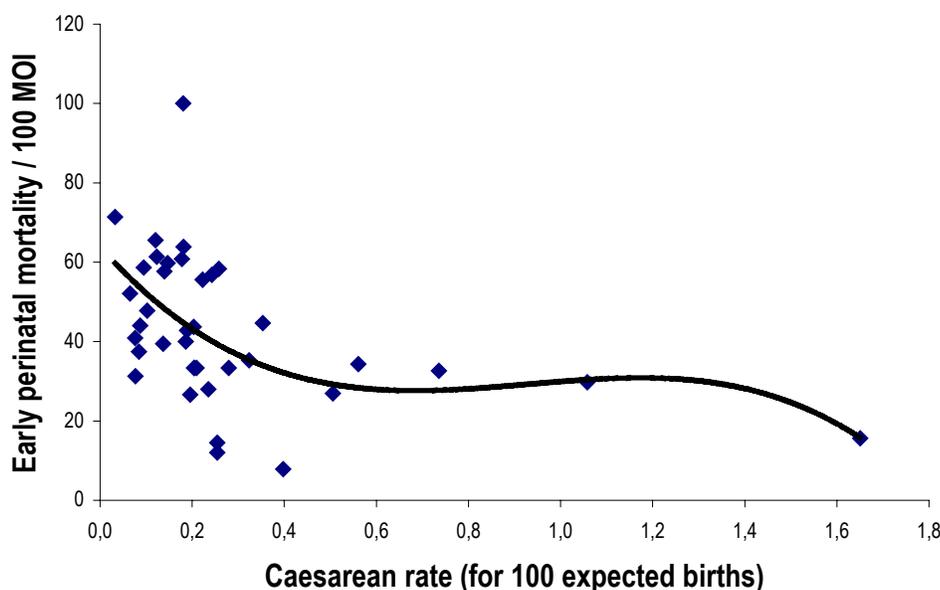
¹⁴ Chi-square = 6.8 p<0.009 for AMI and Chi-square = 0.96 p<0.32 for non-AMI.

Table 16. NUMBER OF CHILDREN STILLBORN AND DYING WITHIN 24 HOURS OF AN MOI, ACCORDING TO GROUP OF INDICATIONS AND TYPE OF AREA, NIGER, 1998

	AMI			Non-AMI			Total		
	Number of MOI	Number of deaths	(%)	Number of MOI	Number of deaths	(%)	Number of MOI	Number of deaths	(%)
Urban	511	170	33%	490	29	6%	1,001	199	20%
Rural	807	456	57%	385	81	21%	1,192	537	45%
Unknown	44	22	50%	56	5	9%	100	27	27%
Total	1,362	648	48%	931	115	12%	2,293	763	33%

For interventions carried out for Absolute Maternal Indication, 36 per cent of these deaths occur after a uterine rupture (of which four out of five are in the rural area). The problems due to obstructed labour are responsible overall for 52 per cent of early perinatal deaths in the urban areas and 77 per cent in the rural areas. This again shows the dramatic importance of the delay in taking the decision to go to a health facility when there is a problem in labour. In the urban area, one of the main cause of early perinatal death is ante-partum haemorrhage (48 per cent of the indication of intervention), whereas in the rural area this is the cause of 21 per cent of infant deaths. Whatever the indication or the type of intervention carried out, there is not usually any hope of saving the infant because in 92 per cent of early perinatal deaths the child is stillborn as the intervention is carried out.

For interventions carried out for non absolute maternal indications, the chances of the infant surviving are equally slim, since six per cent of newborns die after these interventions in the urban areas and 21 per cent in the rural areas. In most cases (78 per cent), these babies are stillborn and the intervention was not able to save them.

Figure 4. MORTINATALITY AND NEONATAL MORTALITY WITHIN 24 HOURS AMONG WOMEN WHO HAVE HAD AN MOI ACCORDING TO CAESAREAN RATE, NIGER, 1998

At around 0.3 caesareans per 100 expected births, the benefit in terms of early perinatal mortality does not increase, and remains close to 30 per cent until the threshold of 1.2 per cent of caesareans. It should be noted, however that 85 per cent of caesareans carried out for non-AMI

resulted in saving the life of the child, in 8 per cent of cases it was already probably too late because the child was stillborn. The other deaths happened in the 24 hours following birth.

Workload and resources

Table 17. HOSPITAL ACTIVITIES BY REGION, NIGER, 1998

	Expected births (EB)	Hospital births	
		Number	% of EB
Agadez	19,269	1,565	8%
Diffa	12,663	542	4%
Dosso	86,856	3,240	4%
Maradi	116,763	2,791	2%
Tahoua	100,985	4,152	4%
Tillabéri	111,751	194	0.2%
Zinder	113,231	2,492	2%
Niamey	27,959	6,849	24%
Total	589,477	21,825	4%

Apart from Niamey, the proportion of births in hospitals is low. Only the department of Agadez, although it is very large, has a slightly higher coverage, the two hospitals of that region are situated in the department's two most populous districts.

The department of Dosso has very low coverage. However, it is one of the less vast departments has three hospitals that cover almost 50 per cent of the population, and one of its districts has a radio communication system for referrals.

The department of Tahoua also has a very low coverage. They also have two hospitals and the department is not very large either. If we remove the population of Tchinta-Abalak, the largest district of this department, but also the least populated, the proportion of births taking place in hospital does not reach 5 per cent.

Table 18. VOLUME OF DELIVERIES AND MAJOR OBSTETRIC INTERVENTIONS BY HEALTH FORMATION AND STATUS OF THE FORMATION, NIGER, 1998

Health formation's district	Hospital status	Expected births (EB)*	Hospital births		MOI		MOI/AMI	
			Number and % of EB	Number and % of hospital births	Number and % of MOI			
Agadez	Public	9,749	974	10%	29	3%	16	55%
Arlit	Privé	8,885	591	7%	37	6%	13	35%
Diffa	Public	5,596	542	10%	25	4%	19	76%
Dosso	Public	21,120	1,613	8%	108	7%	83	77%
Gaya	Public	13,737	1,129	8%	23	2%	19	83%
Loga	Public	7,628	498	7%	9	2%	7	78%
Maradi	Public	11,230	1,021	9%	367	36%	255	69%
Tessaoua	Public	17,863	1,770	10%	19	1%	17	89%
Konni	Privé	20,692	1,364	7%	328	24%	180	55%
Tahoua	Public	19,098	2,788	15%	138	5%	68	49%
Tera	Public	23,877	194	1%	8	4%	8	100%
Zinder	Public	10,310	2,492	24%	321	13%	242	75%
Niamey	Public	27,959	6,849	24%	881	13%	435	49%
Total		192,574	21,825	11%	2,293	11%	1,362	59%

* Expected Births in the district where the hospital is situated.

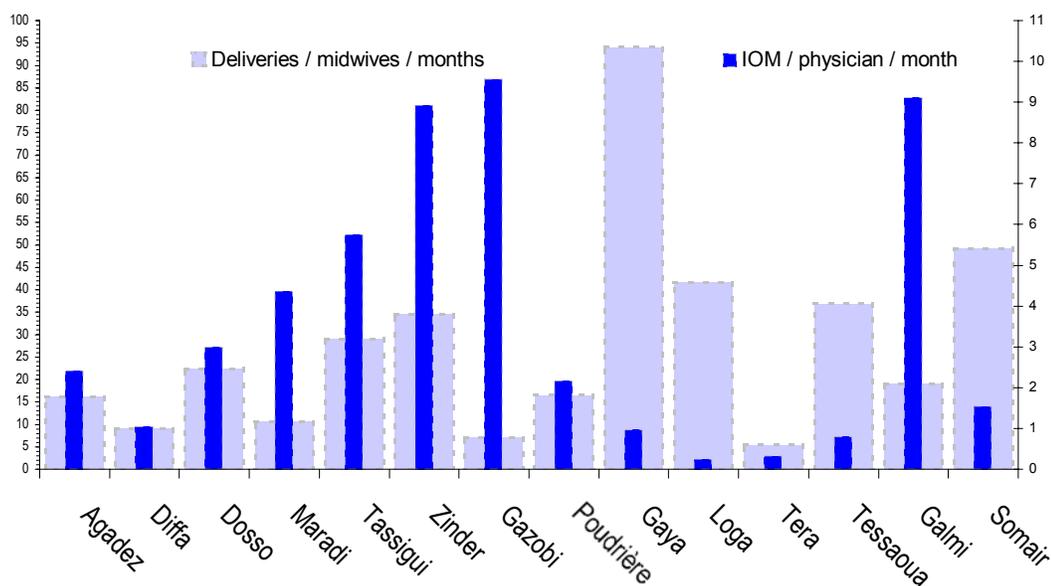
Table 19 below shows the appeal of the different hospitals. This table sets out all the Major Obstetric Interventions carried out in the different hospitals.

Table 19. PROPORTION OF PATIENTS TRAVELLING FROM A DIFFERENT DISTRICT, NIGER, 1998

Health facility	Number of cases	% of women travelling from a different district	
		Number	(%)
Private Hospital Somair Arlit	38	0	
DH Loga	9	0	
DH Tera	8	0	
Tessaoua Maternity	19	3	16%
Poudrière Niamey Maternity	79	18	23%
DHC Agadez	29	8	28%
DH Gaya	25	7	28%
Gazobi Niamey Maternity	809	279	34%
DHC Diffa	27	12	44%
DHC Maradi	370	181	49%
DH Tahoua	143	75	52%
Private Hospital Galmi Konni	328	175	53%
DHC Dosso	112	76	68%
Zinder Maternity	322	244	76%
Total	2318	1078	47%

The Hospital in Zinder, quite logically, attracts patients from neighbouring districts (Magaria, Miriah and Matameye) who therefore attend the nearest facility to their home, the same goes for all the other facilities except for the CHD Dosso. But these hospitals are however not appealing enough to ensure good coverage of the obstetric needs of the rural areas (**Table 11**). Dosso draws in an equal number of women living in the neighbouring districts, but it is not the only hospital in the department; there are also the hospitals of Gaya and Loga, both of which have opened fairly recently and which have a very low or zero appeal. Out of 33 women from Gaya, only 18 were admitted to their district hospital, and 13 went to Dosso. In Loga only half of the women used the services of their district hospital: seven (out of a total of 18 from the district) went to Dosso, even though Loga district has a working ambulance and a radio-communication system which keeps the hospital in touch with the outlying health centres. The hospital in Dosso also draws in almost all the women who live in Douchi district, which seems just as near to Loga. One of the possible explanations is that the road network makes it more accessible, but we do not have that information. Another explanation is the quality of care and of the management of care. In fact, while the three hospitals of this department have at least two doctors each who can carry out interventions. Dosso is the only one that has a gynaecologist in residence. What is more, while the other hospitals only have one midwife, Dosso has six.

Regarding the quality of the management of the cases, there is not a startling difference in maternal mortality, which is slightly higher in Dosso (1.6 per cent of labours, against 1 per cent in Gaya and 0.2 per cent in Loga) which could be explained by the seriousness of the cases or in the peri mortality (between 6 and 7 per cent of in-hospital labours in the three facilities). Lastly, we should not forget that Belgian aid supports Dosso hospital including the presence of expatriate gynaecologists in residence (there has never been any Nigerian gynaecologists in this hospital).

Figure 5. MONTHLY WORKLOAD OF MEDICAL AND PARAMEDICAL STAFF, NIGER, 1998

In six of the hospitals, the doctors carry out less than two major obstetric interventions per month, whereas in the maternity unit in Gazobi in Niamey, in the Galmi hospital in Konni, and in the maternity unit of Zinder, they carry out nine operations per month. Apart from the hospital in Agadez, there are at least two doctors everywhere who could operate. The problem of human resources relates more to gynaecologists since six of these structures do not have any, while there are a total of 21 spread out over eight hospitals, and 10 of them work in Niamey, three in Zinder and three in Maradi.

As for midwives, three facilities only have one in residence (Gaya, Loga and the private hospital in Somair), while there is a net surplus of personnel in the two maternity units in Niamey. The midwife in Loga hospital attends five times more deliveries per month than those in the Gazobi maternity unit, the biggest in Niamey. It seems clear that the spread of personnel is inadequate. A fairer division of medical and paramedical personnel seems possible, at least on paper. You “simply” need to move six midwives from the 107 available so that in each hospital there are at least three, which would mean that the facility could function 24 hours a day.

4. UTILISATION OF RESULTS

Retro-information

Feedback has not been given yet either at the national or regional level. However, it is eagerly awaited, not only by the members of the Ministry of Health, but also and particularly by the actors in the field. They have high hopes that this feedback will dynamise the country's health policy so that the declared intentions of the MSP and its partners are finally acted on.

Perception

Methodological note

Sixteen people were interviewed for the UON study. Seven are part of the Ministry of Health (four at the central level and three at the regional level), four are members of international organisations (UNICEF, UNFPA, WHO, CARE) two are members of local NGOs (CONIPRAT¹⁵ and GNAMASARI¹⁶). One person is part of the German technical cooperation (GTZ) and actively involved in the study itself. The two remaining are the dean of the Faculty of Health Sciences and the Medical Director of one of the maternity units in Niamey that took part in the study.

A member of the UON network co-ordinating team on assignment in Niamey and the Director of Reproductive Health jointly established the list of people to be interviewed.

The interviewer chosen with the agreement of the Ministry of Health and the UON network co-ordination team is a doctor who is qualified in public health, respected by his peers and who has not participated in the data collection or analysis. In order to prepare him for the interviews, a day was set aside for the methodology to follow, after which he carried out a test interview in real conditions to clarify the questions in the interview protocol. Before leaving, the member of the UON network co-ordinating team accompanied the interviewer on the first four interviews.

Results

At the ministry of health, some people interviewed, and particularly those from the regional level, did not seem to have been officially informed about the study and were not involved in it. Only two people from the ministry are in possession of the results. Some interesting remarks were made about the study methodology, for example on the “community” aspect of the deficits, like the reasons why women arrive at the facilities so late. Some people from the ministry or from local NGOs fear that this study will have little effect (like many others according to them) and think that success, in terms of action, will depend on the decisions of the Ministry of Health. It seems that the members of the MPS at the central level are determined to use this study as the basis for redefining maternal health policy in collaboration with the different sectors of the ministry involved in this area. People working at the regional level have also indicated their willingness to take account of these results to try to improve the lot of pregnant women, particularly by improving the medical practice at the hospital level, and to use this study as an indicator for future results.

There are many factors behind maternal mortality in Niger, where the health network is largely inadequate for the task of handling the country's health problems effectively. One of the essential problems in Niger is this low coverage, together with mediocre quality of care, unequal distribution of personnel who are, anyway, poorly trained and often paid late.

Niger also suffers from a clear lack of the financial means, which would allow it to translate its health policy into action. Many partners (international organisations, bilateral organisations and NGOs) invest in the country to improve health, but some of them, and by no means the smallest, complain about the lack of budgetary follow up of the allocated finances, which make it difficult to unlock funds to continue projects.

Local NGOs also support the aims of improving maternal health. Two of these in particular have been working for years, with very little government support, to improve women's position in Nigerian society and to assist them to access health services by helping them to acquire not only the financial and logistical means to use services, but also the freedom to do so.

¹⁵ Committee on traditional practices of Niger

¹⁶ Safe motherhood action group of Niger

5. CONCLUSION

Niger does not seem to have taken adequate measures to ensure satisfactory health service coverage of the country. Despite being the chief aim of the Ministry of Health for many years there has been no visible improvement in the situation. The number of health facilities that have the resources to manage obstetric emergencies remains very limited. If purely preventive measures (such as the identification of risk factors) are out of favour, the move towards managing maternal health through a hospital network still seems in its infancy. The ministry has taken clear positions in favour of this necessity, but effective actions are slow to see the light of day. Niger has suffered from political instability for a long time, and is a very poor country and the budget allocated for health is certainly not enough to achieve the aims of health service coverage. International aid is absolutely necessary if we want to improve this situation, but perhaps because Niger has a high demographic growth rate, some large international organisations still seem preoccupied with overcoming that. Numerous partners are investing in the country to improve health conditions, but it seems that the co-ordination between these partners and the Ministry of Health is not strong enough to allow a global view of problems and solutions. The Ministry itself is split in different directions that do not always work in a co-ordinated way, and collaboration between the Ministry of Health and other ministries, which could have an impact on health in general, is less than optimal.

Even in the areas, which could be considered adequately covered by functioning health facilities, the hospitals scarcely seem able to take up their role of managing emergency cases, even for the people living near the hospital. There is no overall efficient system in place to transport emergency cases from the rural areas. The rural areas seem completely isolated from the health network and the deficits observed are dramatic everywhere. It can also be seen in the study that there are only two cases referred from another health facility. Either because of inadequate diagnosis¹⁷, for fear of being wrong, or for other reasons, the personnel at the first level do not refer women on, or the women for cultural, financial, material or other reasons, do not go to the hospital where they were referred. The referral system to be developed will need to have the support of an integrated health network, which includes all the levels of care.

An other important problem, responsible for the under-utilisation of health services both for normal labour and for obstetric emergencies, is probably the way mothers are treated. The midwives use scientific attitudes and language learnt at school and the often-illiterate mothers remain strongly attached to the practices and traditional language of pregnancy and childbirth, and communication is difficult.

Niger therefore combines all the problems which are most usually evoked to explain high level of maternal mortality: insufficient financial, human and material resources to ensure efficient health coverage, an illiterate population living in poverty, and a persistent attachment to traditional practices which are often in conflict with modern medicine, and finally a health policy which operates more in theory than in practice and is badly served by a dilution of responsibilities at the heart of the numerous departments of the Ministry of Health.

In the context of the status quo, it is to be hoped that the UON study, by giving a clearer and more concrete view of reality, will bring a new dynamism to the actors engaged in the fight against maternal mortality. To make the best use of this study it is essential that structured feedback at the national and regional level is carried out promptly. It seems in fact that many senior personnel at both levels are only vaguely aware of the process which has been carried out in their country, and even less aware of the results. Finally, and this is essential, this study should not, as some of the interviewees fear, remain one more theoretical study, but should pave a way for practical and effective decisions to be taken which will allow the country to move out of the poverty of the health network.

¹⁷ Or perhaps because the variable "cases referred" is not well recorded in the database.

ANNEX 1: QUESTIONNAIRE FOR WOMEN

Q1 – Identification of health formation

Department _____

Health district _____

Category of hospital (HN, CHD, MaT REF, DS) _____

Name of health formation _____

Q2 - Identification of parturient

Admission number _____

Q3 – Date of admission: ____/____/____/

Date of delivery: ____/____/____/

Q4 – Year of birth: _____

Q5 – Address of parturient

District: _____

Village/city: _____

Quarter: _____

Q6 – Health centre area: _____

Q7– Type of area 1= Urban 2= Rural 3= Unknown

Q8 – Place of delivery

1=At home 2= this health formation 3= another formation 4= which other? __

Q9 – Major Obstetric Intervention

Date of intervention: ____/____/____/

Q10 – Type of intervention MOI

1= Caesarean

2= Hysterectomy

3= Laparotomy for uterine tear / uterine rupture

4= Version and extraction

5= Craniotomy / Cranioclasia / Embryotomy

6= Hypogastric or uterine artery ligation

9= Other (specify)

Q11 – Indication

1= Uterine rupture

2= Obstructed labor for transverse presentation

3= Obstructed labor for frontal presentation

4= Obstructed labor for foeto-pelvic disproportion

5= Obstructed labor for other presentation

7= Obstructed labor for dynamic dystocia

8= Obstructed labor for other cause

9= Other cause

10= Complication connected with cord

11= Ante-partum haemorrhage for placenta praevia

12= Ante-partum haemorrhage for retro-placental haematoma

13= Ante-partum haemorrhage for other cause

14= Post-partum haemorrhage

15= Toxaemia, eclampsia, pre-eclampsia

16= Puerperal infection

17= Breech presentation

18= Antecedent of caesarean

19= Other obstetric antecedent

20= Foetal distress

21= Cause not recorded

99= Other cause (specify)

Q12 – Results for child

1= Born living and emerged living

- 2= Still-born
- 3= Born living and died within 24 hours
- 4= Born living and died after 24 h
- 5= Not recorded

Q13 – Results for mother

- 1= Nothing to report
- 2= Complication See Q14
- 3= Referred to another health formation
- 4= Died See Q15 and Q16

Q14 – Type of complication _____

Q15 – When mother died

- 1= Before intervention
- 2= During intervention
- 3= After intervention
- 4= Not recorded

Q16 – Cause of mother's death

- 1= Hypertensive disorder
- 2= Haemorrhage
- 3= Infection
- 4= Other (specify)
- 5= Unknown

Q17 – Date of mother's discharge ____/____/____

Q18 – Name of interviewer

Q19 – Date of completion of questionnaire: ____/____/____

Q20 – Check

Observation (about problems during survey or other observation)

ANNEX 2: QUESTIONNAIRE FOR HEALTH FORMATION**Identification of formation**

Q1 Department: _____
 Health district: _____
 Name of the formation: _____
 Address of the formation: _____

Q2 **Type of hospital** (see Q3)
 1= Public 2= EPA 3= Private 9= Other: _____

Q3 **Category of formation**
 1= National hospital 2= Regional hospital (CHD) 3= District hospital (HD)
 4= Reference maternity 9= other (specify): _____

Material resources

Q4 Number of maternity beds
Q5 Total number of beds in the health formation
Q6 Number of delivery beds
Q7 Number of operating theatres
Q8 Number of operation theatres reserved for obstetric
Q9 Number of functional vacuum extractor (mechanical)
Q10 Number of functional vacuum extractor (electronic)
Q11 Number of functional forceps
Q12 Number of ambulances
Q13 Number of radio-communication system (BLU)

Human resources**Medical**

Q14 Number of gynaecologists
Q15 Number of surgeons
Q16 Number of junior doctors (gynaecology and obstetric)
Q17 Total number of physicians in the health formation
Q18 Others: _____

Paramedical

Q19 Number of surgeon assistant
Q20 Number of anaesthetist assistant
Q21 Number of midwives / TSSO
Q22 Number of IDE / TSSI
Q23 Number of IC
Q24 Number of other paramedical (certificated)
Q25 Number of other paramedical (with state diploma)

Activity of health formation

Q26 Number of admissions to maternity unit
Q27 Total number of deliveries
Q28 including dystocics deliveries
Q29 including eutocics deliveries
Q30 Total number of still-births
Q31 Total number of maternal deaths
Q32 Total number of caesareans
Q33 Total number of uterine ruptures
 Name of interviewer _____
 Date of completion of questionnaire ____/____/____
 Results of the survey
 Questionnaire completed
 Questionnaire not completed

Observations (problems during survey)

ANNEX 3: LIST OF MAIN DOCUMENTS PUBLISHED BY THE UON IN NIGER

The Ministry of Health

Janvier 2001 Les Besoins Obstétricaux Non Couverts au Niger en 1998, Rapport final, Ministère de la Santé Publique du Niger, 58 p.

Mai 1999 Protocole de recherche sur les Besoins Obstétricaux Non Couverts, Comité de pilotage de l'étude BONC, 18 p.

Co-ordination team

Avril 2001 L'approche des Besoins Obstétricaux Non Couverts pour les Interventions Obstétricales Majeures. Documentation des politiques de santé maternelle, République du Niger. Partie 1. Fabienne Richard, Equipe de gestion et de coordination, UON Network, Anvers, 19 p.

Juillet 2000 L'approche des Besoins Obstétricaux Non Couverts, Rapport de mission du 17 au 28 juillet 2000, 13 p.

Janvier 2000 L'approche des Besoins Obstétricaux Non Couverts, Rapport de mission du 3 au 7 janvier 2000, 5 p.

Mars 1999, Les Besoins Obstétricaux Non Couverts au Niger: une proposition d'étude-action, Rapport de mission de consultation à Niamey du 17 au 27 mars 1999, Xavier de Béthune, 4 p.

Other documents used for the study

Août 2000 Projet de Coopération Sud-Sud d'appui au Programme de Santé de la Reproduction, Coopération Française, Ministère de la Santé Publique du Niger et Office National de la Famille et de la Population de la Tunisie, 10 p.

Juillet 2000 Projet de Santé de la Reproduction et Planification Familiale, Projet SR/PF et Ministère de la Santé Publique 38 p.

Juin 1998 Projet de déclaration de politique nationale de santé de la reproduction, Ministère de la Santé Publique, Direction de la Santé Familiale, 14 p.

Juin 1998 Programme de Coopération 2000-2004 (Document de stratégie, Fonds des Nations Unies pour l'Enfance (UNICEF) et le Gouvernement du Niger, 33 p.

Juillet 1995 Déclaration de politique sectorielle de santé, Ministère de la Santé Publique, annexe 6, 11 p.

Mars 1994 Plan de développement sanitaire 1994-2000, Ministère de la Santé Publique, 72 p.

Thesis

2000 Etude des Besoins Obstétricaux Non Couverts dans la Commune III de Niamey, thèse pour l'obtention du grade de Docteur en médecine, Soumaila Aminatou, 82 p.

Novembre 2000 Analyse du pronostic foeto-maternel basée sur l'approche des Besoins Obstétricaux Non Couverts dans la communauté urbaine de Niamey et dans le département de Tillabéri, thèse pour l'obtention du grade de Docteur en médecine, Patale Tezere, 91 p.

Juillet 1999, Etude des Besoins Obstétricaux Non Couverts dans la Commune III de Niamey, thèse pour l'obtention du grade de Docteur en médecine, Bagna Beidou Aminaou, 76 p.