

Tackling Unmet Needs for Major Obstetric Interventions

Case Studies

Burkina Faso

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ABBREVIATIONS

AMI: Absolute maternal indication

CAM team: Coordination and management team

CBR: Crude birth rate

DHS: Demographic and Health Survey

EB: Expected births

FP: Family planning

GFR: General fertility rate

HDI: Human Development Index

IEC: Information Education Communication

LB: Live births

MCH: Maternal and child health

MOI: Major obstetric intervention

MOMA: Maternal Morbidity in West Africa

MPH: Ministry of Public Health

OCCGE: Organisation de Coordination et de Coopération pour la Lutte contre les Grandes Endémies (Organisation for Coordination and Cooperation Against Endemic Diseases)

PPLS: Projet Population et Lutte contre le Sida (Population and AIDS Control Project)

UNDP: United Nations Development Programme

UNFPA: United Nations Population Fund

UNICEF: United Nations Children Fund

UON: Unmet obstetric needs

UR: Uterine rupture

WHO: World Health Organisation

1. INTRODUCTION

The Unmet Obstetric Needs study in Burkina Faso has a particular feature in the exceptional leadership given by the Ministry of Health, represented in this case by the Family Health Division, which took responsibility for the whole process of the study and even, unusually, used part of its own budget to finance part of the cost of collecting data. While the partners in the study played an active part in it, particularly at the introductory stage of the process, credit for the carrying out of the study must go to the Burkinabé coordinators of the project.

This leadership, however, had certain disadvantages, not the least of them being that in view of their important functions in the Ministry the persons responsible for the project did not always have enough time to devote to it. This was no doubt one of the factors which led to slowness in the collection of data throughout the country and consequently to the delay in the retro-information process and the publication of the final report.

In this case study, therefore, we propose to begin by surveying the context of the study in Burkina Faso, concentrating on the development of health policies, particularly in the field of maternal health. This will be followed by a description of the process of the study, its methodology, and finally an analysis of its results. For the reasons indicated above, however, it will not be possible to evaluate in this paper the impact of the study on maternal health strategies.

2. CONTEXT

General

Burkina Faso, lying in the heart of West Africa, has an area of 274,200 sq.km and had a population in 1998 of around 11 million. It is a young population, with 49% aged under 15. Burkina Faso is a poor country, ranked 172nd out of 174 in the HDI of the UNDP for 2000. According to the priority survey of household living conditions in 1994, 44.5% of the population were rated as poor (with an annual income per adult of under 72,690 FCFA), and 27.8% fell below the "extreme poverty" line (with an annual income per adult of under 31,749 FCFA). The population of Burkina Faso has long shown a migratory trend: between 1988 and 1992, for example, 273,000 people immigrated into the country and 329,000 emigrated to other countries. The exchanges of population are mainly with the neighbouring Ivory Coast. There is also much internal migration and a massive drift of population from rural areas, mainly to the capital and Bobo-Dioulasso.

Burkina Faso (formerly known as Upper Volta) gained its independence in 1960. The country's first President was confronted from the outset by serious financial problems, due principally to reductions in international subsidies. The drastic measures which he imposed on the country to reduce the national deficit provoked large-scale strikes which led him to resign, to be replaced in 1966 by a President from the armed forces. The new government, faced with the same problem, also resorted to severe measures to reduce the budgetary deficit. There followed a succession of other governments until a coup d'état in 1982 which established the Council of Popular Salvation (Conseil du Salut du Peuple), also headed by the military, with Thomas Sankara as prime minister. A year later Sankara became President and formed the National Council for the Revolution. This developed a People's Development Plan under which the number of children receiving education was increased, social housing was built, a large-scale vaccination programme was carried out and water supplies were improved by the construction of dams and the drilling of wells. In 1987, under President Blaise Compaoré, the Popular Front set the country on course towards a state founded on law and the establishment of the Fourth Republic in 1991, with Compaoré as the country's first President elected by universal suffrage.

Since becoming independent Burkina Faso has become aware of the importance of the questions of population and development. A number of events have made possible the introduction of laws and programmes in these fields:

- In 1970, the adoption of the Public Health Code and the establishment of a Ministry of Health.
- The adhesion in 1979 to the Alma Ata declaration on primary health care strategies, in particular on maternal and child health and family planning.
- The repeal in 1986 of the 1920 law banning the distribution of contraceptives.
- The revision of the penal code legalising the extension of therapeutic abortion to cases of rape, incestuous pregnancy and congenital malformation.
- The repression of excision, rape and levirate in 1996.

In order to carry out these policies a number of specific institutions were established: the Directorate of Family Health in 1987, the Directorate of Education in Population Matters in 1982 and the Demographic Teaching and Research Unit in 1994.

After independence (1960–78) the Burkina Faso health system was still organised on a very hierarchical basis, as it had been in the colonial period, and specialised establishments were to be found only in towns. However there was now developing a new vision which sought to bring the populations of rural areas closer to the centres of care. Health policy was directed towards curative medicine, with the emphasis on care for individuals and on hospital care and with little attention being given to preventive medicine. The main lines of health policy in this period were action against the major endemic diseases and the promotion of mass health services in rural areas. In order to achieve these objectives, numbers of dispensaries were built, but without adequate finance it was often impossible to equip them and they were unable to function because of lack of medical and paramedical personnel.

In the early 1980s Burkina Faso adopted the ideas advocated by the Alma Ata conference, and under the leadership of Thomas Sankara health policy was redirected towards primary health care: action was no longer centred on the individual but on the community, and became much more preventive (mother and child assistance and protection, vaccination, promotion of good habits in the matter of hygiene). At this period, too, the Faculty of Health Sciences was established for the training of medical personnel. Burkina Faso also has three national public health schools for the training of paramedical personnel. In the late eighties the government of the new President, Blaise Compaoré, continued with this policy, seeking to improve health coverage by developing preventive medicine and giving the national hospitals financial and management autonomy by the system of recovery of costs. In the early nineties health centres were also given this management autonomy.

Between 1985 and 1990, helped by a World Bank project, Burkina Faso built 142 rural and urban health centres. For lack of equipment, and particularly of personnel – since the World Bank project covered only construction costs – 30% of these centres soon had to close down.

Between 1960 and 1996 the budget allocated to health fluctuated enormously: from 7.4% of the total national budget in 1960 it increased to 11.8% in 1963, only to fall progressively thereafter to 4.9% in 1980. During the 1980s it remained around 6.5%, but then fell progressively to 2.4% in 1996. Since then it has again been increasing, rising to almost 10% of the national budget in 1996. The annual health budget increased from 17 billion FCFA in 1998 to more than 30 billion FCFA in 1999.

In the early 1990s there was a sharp fall in the use of health structures by the population, and this trend became more marked between 1993 and 1996. According to the World Bank (1994) health formations in Burkina Faso were used to less than 30% of their capacity, mainly because the quality of service provided was regarded as poor, largely because of the

impossibility of finding medicines at affordable prices but also because of the attitude of health personnel, often judged to be unduly arrogant. This was also remarked on by the Ministry of Health in its "Stratégie Nationale pour une Maternité sans Risque 1998–2000": "It is to be noted that the existing infrastructures are seriously under-used, particularly in rural areas. Studies carried out in certain rural areas show that only 10% of minor illnesses and 14% of major illnesses have recourse to the health services."

The programme of priority action for 1991–96 reformed the health system by putting the emphasis on decentralisation, based on the development of health districts (53 of which were established in 1992), in order to bring the operational level of the health pyramid closer to the population and to communities. Efforts are also being made to improve the supply of medicines, supported by the establishment in 1992 of an organisation for the purchase of essential generic medicines (Centrale d'Achat des Médicaments Essentiels Génériques, CAMEG) in order to improve the availability of medicines in rural areas. Another objective is to increase community participation and strengthen the strategies advocated in the Bamako Initiative by improving access to primary health care for the whole population at affordable charges. This policy is particularly to the benefit of women and children.

In spite of this programme the health situation is still disturbing. Maternal mortality is high: 566 per 100,000 live births (LB) in 1997 according to a study in rural areas, 318 per 100,000 LB in Ouagadougou according to the MOMA study in 1994–96, 1379 per 100,000 LB according to a WHO study in 1995. The infant mortality rate is 107 per 1000 (DHS 1996) and life expectancy at birth 46.4 years in 1997 (UNDP 2000). Health coverage is still inadequate: only 51% of urban populations and 48% of rural populations have access to health care structures.

The organisation of health administration in Burkina Faso has a pyramidal structure, with three levels:

- at central level, the Ministry of Health;
- 11 regional directorates; and
- 53 health districts.

In 1995 there were 898 public health formations, including two national hospital centres, nine regional hospital centres, 17 medical centres with surgical theatres, 61 other medical centres, 677 health and social promotion centres, 116 independent dispensaries and 16 independent maternity units. There were also 199 structures in the private sector, including 13 maternity clinics. Most of the private structures were located in Ouagadougou, the capital, and Bobo-Dioulasso.

Maternal health policy

Maternal and child health was the object of particular attention in the early eighties, when various activities concerning mother and child, mainly preventive, were defined. In accordance with the ideas discussed at Alma Ata and the Bamako Initiative, the main elements in this policy were maternal and child health, antenatal consultations and an expanded programme of immunisation.

In 1991 the official policy on population defined as its objectives the reduction of maternal and infant mortality, increased use of contraceptives and the strengthening of the means of action open to women.

A first programme of priority activities (1991–95), adopted in 1992, pursued specific objectives in maternal and child health, based on MCH/FP and IEC programmes. The main elements in this programme were action against excision and violence on women, the strengthening of primary health care and the adoption of a law on abortion. At this time, too, the reform of the health system, putting emphasis on decentralisation, was carried through.

After the International Conference on Population and Development in 1994 maternal health policy, hitherto centred on controlling demographic growth by a programme of family planning, was given a new direction. A new vision of reproductive health came to the fore: the limitation of the number of births was no longer the essential factor, and the quality of life to be guaranteed to the population became one of the major axes of the new policy. This programme no longer targets only women of childbearing age, but is aimed also at adolescents, schoolchildren and students and drug addicts, and is concerned also with problems connected with migratory movement and inequality between the sexes. Among the actions taken after the 1994 conference was the establishment in 1997 of a ministry responsible for advancing the interests of women, the Ministère de la Promotion de la Femme. New needs were identified, for example access to information on family planning, access to contraceptive methods for adolescents, recognition of the rights of individuals and particularly of women, and the involvement of men in maternal health problems.

In 1998 maternal mortality was still high (484 per 100,000 live births according to the DHS for 1998–99). Problems associated with delivery, but also abortions, were responsible for many of these deaths. Socio-cultural and economic factors, difficulty of access to health services, feminine mutilations (the practice of excision is still common: according to the National Institute of Statistics and Demography it is still undergone by 66% of Burkinabé women, and the proportion is still higher according to the DHS for 1999, which gives a figure of 84%), traditional and frequently harmful practices associated with childbirth and forced marriage at an early age are among other factors aggravating the very disadvantageous social situation of women.

In order to achieve significant reductions in maternal and neonatal morbidity and mortality the Ministry of Health developed in 1998 an action plan aimed at reducing maternal mortality by 20% and infant mortality by 30% as compared with 1991 levels. For this purpose it proposed:

- to increase by 50% the accessibility and availability of health services for target groups (pregnant women and neonates);
- to provide preventive measures against risks associated with pregnancy and childbirth;
- to ensure that adequate care was available for at least 80% of at-risk, complicated or referred cases;
- to make provision for the rapid evacuation of at-risk and complicated cases;
- to reduce by at least 60% the fatality rate for serious complications;
- to reduce socio-cultural barriers to the use of Safe Motherhood services; and
- to involve communities and other sectors more closely in Safe Motherhood services.

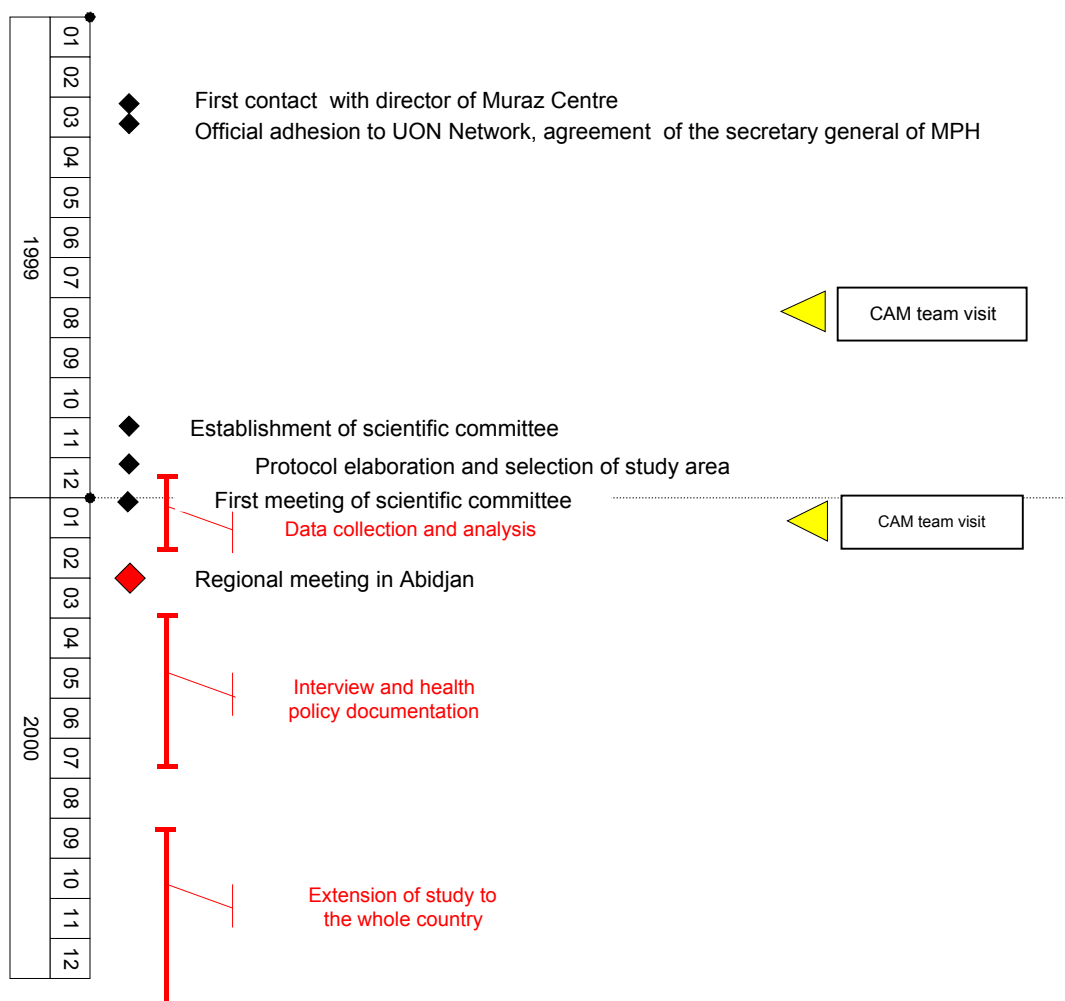
This will be achieved by strengthening health structures in terms of equipment, training and further training of personnel, adaptation of the protocols for dealing with cases, improvement of the system for the collection of data and community participation, but also by the establishment of a system for evacuation and referral and the development of audit mechanisms for the analysis of maternal and neonatal deaths. A number of partner organisations – UNFPA, PPLS, UNICEF and WHO – have undertaken to support this programme. The budget for the project is estimated at 245,000 euros. Numerous other donors – the United Nations Development Fund, the Dutch, Danish and German cooperation organisations, the Rockefeller Foundation and the International Family Planning Association – are contributing to the financing of various programmes relating to reproductive health, either directly or through non-governmental organisations. Some non-governmental organisations – the Save the Children Fund, Plan International, World Solidarity, the International Planned Parenthood Federation, the Population Council, SFPS (Family Health and AIDS Control), etc. – are also working in this sector.

In the course of the interviews carried out during the UON study most of the members of international organisations and/or non-governmental organisations deplored a lack of

coordination between the various donors of funds, which they thought was partly due to the Ministry of Health's poor management skills. They were almost unanimous in recognising the relevance of the programmes developed by the Ministry, but felt that they were frequently ineffective because of slowness in putting them into effect. They also regretted the lack of awareness of the problem of maternal mortality shown by officers at central level, who as a result proposed lines of action which were often dictated by the major contributors of funds and most frequently remained purely theoretical. Similar views have been expressed by health workers in the field, who, while trying to apply the directives of the Ministry of Health, realise that the decision-makers are not totally involved in the process and that their programmes are not always matched to the realities in the field which they observe in their daily work.

3. THE UON EXERCISE

Figure 1. CHRONOGRAM OF THE UON EXERCISE IN BURKINA FASO



Approach to the collection of data in hospitals

The collection of data was carried out by a medical student in his thesis year, with help in each hospital from an officer of the maternity services trained for the purpose. This phase of the study was supervised by the chief researcher and the coordinator-general, who checked the completed questionnaires. The scientific committee had thus opted for a method involving minAMII participation by peripheral staff, making a single person responsible for the main part of the data collection process. This was no doubt entirely justifiable in view of the shortage of staff in the various health structures. A procedure giving local personnel a more active role would have

involved training sessions and a call on the time of staff who were often too thin on the ground to cope with their everyday tasks. The method adopted proved effective where the numbers of structures to be visited and documents to be examined were limited; but there must be some doubt whether it would be satisfactory for a study covering the whole country, when the collection of data might extend over a considerable period.

Equipment and method

Introduction

The UON study has two complementary parts: one based on a questionnaire for women, analysing major obstetric interventions, their indications and their results for mothers and children, and another based on a questionnaire for health formations, making it possible to draw up an inventory of the human and material resources of the various health structures.

Population studied

This study is retrospective, covering data for 1998 collected between December 1999 and February 2000 for functional health formations in four regions in Burkina Faso. These regions were selected as being representative of urban and rural areas containing functional health structures. One of them, Fada-N’Gourma, where UNICEF has contributed to the financing of the study, is one of the poorest and most disadvantaged in terms of health. Later the study was extended to the rest of the country. This second phase, initially planned for March–May 2000, was carried out in September–October of that year, as a result of delay in the procedures for payment of the parties involved. Unfortunately, for reasons unknown, we have so far received only the data for the first phase of the collection, and the analysis in this paper will therefore be limited geographically to the four regions shown in **Table 1**.

Table 1. POPULATION OF REFERENCE BY REGION, BURKINA FASO, 1998

Region	Number of inhabitants	Expected births
Banfora	350,814	16,844
Bobo-Dioulasso	1,204,367	54,406
Fada-N’Gourma	806,705	40,151
Ouahigouya	699,158	34,361
Total	3,061,044	145,762

The population figures are supplied by the National Institute of Statistics and Demography. They are taken from the 1996 census of population and housing conditions. The annual rate of increase used in the projection for 1998 was 2.38%.

The estimates of expected births are based on the general fertility rates for urban and rural areas. The proportions of women and of women between 15 and 49 according to type of area used in these estimates come from the Demographic and Health Survey for 1999.

Referral rate

The referral rate, an essential element in the study, which makes it possible to adapt the reality of the country to the UON protocol and is necessary to allow those locally involved to adjust the study to the circumstances of their area, was calculated a posteriori on the basis of the results obtained in the towns of Ouahigouya, Banfora, Fada-N’Gourma and Bobo-Dioulasso, in which the accessibility of health care was judged by the scientific committee to be “less difficult”.

Table 2. DATABASE FOR CALCULATION OF REFERRAL RATE (FIGURES FOR 1997)

	Urban population	Expected births	MOI/AMI performed	Referral rate
Ouahigouya	53,740	1,840	27	1.46
Banfora	52,380	1,793	25	1.39
Fada-N'Gourma	30,759	1,053	16	1.52
Bobo-Dioulasso	388,797	13,311	165	1.24
Total	525,676	17,997	233	1.3

The referral rate calculated by the scientific committee was 0.96. It has been readjusted here to take account on the one hand of the use of the general fertility rate in the calculation of expected births and on the other of the corrections in the “women” file of the numbers of MOI/AMI actually performed. The reasons for these changes are explained below in the discussion of the data base and of biases.

Criteria for inclusion

The questionnaire for women covered all women admitted to a health structure in the year 1998 for a major obstetric intervention for one of the indications listed in the UON protocol, together with all women whose deaths in these structures were related to pregnancy or the consequences of childbirth.

The questionnaire for health formations covered all structures which were functional during 1998 in terms of their capacity to provide surgical treatment for obstetric problems.

The variables studied

Questionnaire for women

This questionnaire (presented in Annex 1) made it possible to construct a “women” file which provided the basis of an analysis designed to reveal deficits in each district. The questionnaires were completed by the national study team in collaboration with the district team and the staff of hospital maternity departments. Of the variables covered in the questionnaire the most important for the purposes of the analysis are the following:

Name of health formation

District in which the formation is situated according to the administrative structure of Burkina Faso.

District of origin of mother: This information is given by the mother on admission to hospital. It should be treated with caution, since the mother may declare as her area of residence not her real home but a temporary residence, usually situated near the health formation, where she has been staying for the last stages of her pregnancy.

Area of origin of the mother: urban or rural. All women living in one of the towns (according to the administrative definition of a town) with a health formation effectively offering major obstetric interventions are regarded as living in an urban area. All women not resident in such a town are regarded as living in a rural area.

Type of intervention: Except for symphyseotomy, which is not practised in Burkina Faso, the list of interventions considered is as suggested in the basic UON protocol.

Indication for intervention: The indications considered are also as suggested in the UON protocol.

Results for mother: nothing to report, died, complication, referred.

Results for child: born living and living when discharged from hospital, stillborn, died within 24 hours of birth.

Time and cause of mother's death: before, during or after intervention – infection, haemorrhage, hypertensive disease.

Questionnaire for health formations

This questionnaire was used to construct a “health formation” file, required for the analysis of the human and material resources of each health formation and for the linking of information with the “women” file.

Of the variables covered by this questionnaire the most important for the analysis are:

Name of health formation

Type of formation: private or public.

Category of formation: national hospital, regional hospital, district hospital, medical centre with surgical theatre.

District in which the formation is situated according to the administrative structure of Burkina Faso.

Number of functional operating theatres

Number of gynaecologists and doctors with surgical competence: This includes not only gynaecologists but also all doctors in the health formation capable of carrying out major obstetric interventions.

Number of midwives and nurses with gynaecological competence: This includes all paramedical personnel capable of carrying out deliveries.

Total number of births

Number of dystocic births

Number of caesareans

Number of uterine ruptures

Material used in collection of data

For information on individual cases of major obstetric interventions for absolute maternal indications the source of data was the questionnaire for women (see Annex 1). A questionnaire was completed for each case meeting the criteria (a woman who had had an MOI in 1998 or whose death was related to her pregnancy). The sources of information were the following:

- the patient's file;
- the records of hospital treatment;
- the register of maternal deaths;
- the register of the operating suite; and
- the post-operative register.

The collection of data was supervised by the chief researcher and the coordinator-general. The completed files were then checked and missing data systematically sought. The sources were not always complete, and it was sometimes necessary to question staff to supply missing or not properly recorded data.

Information on health formations – that is, all health structures in which major obstetric interventions were performed during the year 1998 – was obtained from the “health formation” questionnaire (presented in Annex 2) at the same time as data was collected for the “women” questionnaires.

The source of information for the completion of the questionnaires is not stated, but seems to have been administrative. There does not seem to have been any cross-check between the two types of questionnaire; for, as will be seen below, the numbers of caesareans and uterine ruptures recorded in each type of questionnaire do not agree.

The data base

Description of data used

The woman file

The original “women” file contained 940 records; no duplicates were found and no cases were withdrawn from this file. The file contained 921 MOIs, including 640 MOIs for AMI, 281 MOIs for non-AMI and 19 non-AMI maternal deaths. The following changes were made:

- 18 cases included among MOIs for AMI were maternal deaths, 13 of which took place before any intervention; for the others there is no information on the intervention performed. These 19 cases were therefore excluded from the list of MOIs, but were retained among the AMIs, since they all died of severe haemorrhages.
- 10 MOIs were not performed for absolute maternal indications (non-AMI abnormal presentations).

After these modifications the file contains 611 MOIs for AMI, 291 MOIs for non-AMI and 38 cases in which there was no major obstetric intervention, the mother having died before any intervention in 37 of these cases (19 AMI and 18 non-AMI).

Other modifications were also required to correct certain inconsistencies in the file:

- Laparotomies for frontal presentation (1 case), transverse presentation (2 cases), foeto-pelvic disproportion (2 cases), placenta praevia (1 case) or eclampsia (1 case) became caesareans.
- Hysterectomies for frontal presentation (1 case) or foeto-pelvic disproportion (2 cases) became caesareans.
- One case of version and extraction for post-partum haemorrhage became an “other intervention” (non-MOI for AMI), the woman having given birth in a different health formation from the one in which the operation in question here took place.
- One case of caesarean for unknown cause was taken off the list of MOIs, the mother having died before any intervention.
- One case of version and extraction for ectopic pregnancy became a laparotomy.
- Six MOIs (1 laparotomy and 5 caesareans) were taken off the list of MOIs, the mothers having died before any intervention (1 uterine rupture, 1 transverse presentation, 1 foeto-pelvic disproportion, 1 dynamic dystocia and 2 placenta praevias).

These modifications thus took nine MOIs off the list (6 for AMI, 3 for non-AMI). There remain on the file 893 MOIs, 605 for AMI and 288 for non-AMI.

After these corrections have been made some items of information are still missing for certain variables. **Table 3** summarises the problems which remain unresolved for the most important variables.

Table 3. DATA MISSING OR NOT MENTIONED IN THE "WOMEN" FILE, BURKINA FASO, 1998*Over all data collected*

Variable	Data					
	Missing		Not mentioned		Total	
	Number	%	Number	%	Number	%
Whole file(940 cases)						
Indication of intervention	12	1.3%			12	1.3%
Type of intervention	10	1.1%			10	1.1%
Result for child	8	0.8%	45	4.8%	53	5.6%
Result for mother			41	4.4%	41	4.4%
Mother'deaths (95 cases)						
When mother died	5	5.3%			5	5.3%
Cause of mother's death			3	3.2%	3	3.2%

For MOIs for AMI

Variable	Data					
	Missing		Not mentioned		Total	
	Number	%	Number	%	Number	%
Whole file (605 cases)						
Result for child			14	2.3%	14	2.3%
Result for mother			33	5.5%	33	5.5%
Mother'deaths (40 cases)						
When mother died	1	2.5%			1	2.5%
Cause of mother's death			2	5%	2	5%

The most poorly recorded data is that concerning the result of the intervention for mother and child. There are, however, only small numbers of items of information missing.

Table 4 shows the distribution of cases in the final file, which will be the subject of analysis, according to type of intervention and category of indication.

Table 4. DISTRIBUTION OF CASES ACCORDING TO TYPE OF INTERVENTION AND CATEGORY OF INDICATION, BURKINA FASO, 1998

		AMI		
		Yes	No	Total
MOI	Yes	605	288	893
	No	25	22	47
	Total	630	310	940

In this table there are 47 cases in which there was no major obstetric intervention. The inclusion of 46 of these cases is justified because of the death of the mother, which occurred in 37 of the cases before any intervention, 19 of them for AMI and 18 for non-AMI (eclampsias, ectopic pregnancy, puerperal infection, etc.). The 9 other cases include 6 cases of AMI classed in the category of patients who had not had a major obstetric intervention, the type of intervention usually being given as "other intervention" without details (5 of these women having died during or after the intervention), and 4 non-AMI cases, all of women who died during or after the intervention. The last of these 47 cases was a non-major intervention for post-partum haemorrhage.

The “health formations” file

The data relates to seven health formations, only six of which performed major obstetric interventions during the year 1998. The other one, a medical centre with a surgical theatre in Houndé, was non-functional during most of 1998 because of the lack of sterilisation facilities; only 4 caesareans were performed during the year. Nevertheless there were numerous births there, and a “health formations” questionnaire was therefore completed for this structure.

Reconciliation of data from the “women” and “health formations” questionnaires

There are inconsistencies between the data from the “health formations” questionnaire and that from the “women” questionnaire. Except in one hospital the number of caesareans declared in the “health formations” file is higher than in the “women” file. Altogether there appear to be 96 cases of caesareans missing from the data base; but it seems highly probable that laparotomies (other than those for ectopic pregnancy) were assimilated to caesareans by the staff, no doubt non-medical, responsible for preparing the annual hospital statistics. Uterine ruptures, on the other hand, are under-declared in the “health formation” questionnaires: there are 45 fewer in these questionnaires than in the “women” file. Only for one hospital, in Diapaga, are the figures for these two variables similar in both sources of data.

These inconsistencies presumably reflect the lack of any cross-check between the two questionnaires during the collection of data.

Discussion of biases

“Demographic” biases

The population data comes from the last general census of the population in 1996, brought up to date by the National Institute of Statistics and Demography on the basis of an annual rate of increase of 2.38%. The number of births expected was originally estimated on the basis of a crude birth rate (CBR) of 50 per 1000. In the last DHS (1998–99), however, the CBR was estimated at 45.1 per 1000 for the country as a whole (32.6 per 1000 in urban areas and 47 per 1000 in rural areas). Since these figures correspond to those supplied by the United Nations (45.9 per 1000) and the United States Bureau of the Census (45 per 1000), it seemed preferable to use a more exact method of calculation in the estimate of expected births, taking account of disparities between types of area not only in relation to fertility but also to the male/female ratio and the proportion of women of childbearing age (15–49). This data being available in the last DHS, expected births were therefore estimated on the basis of the general fertility rate (GFR) according to type of area. In comparison with the data estimated by the Burkina Faso scientific team, using a CBR of 50 per 1000, the use of the GFR gives a total figure of expected births lower by 5%; but while the figures are very similar for rural areas there are substantial differences in urban areas. Using the CBR, we obtain a figure of 26,284 expected births in urban areas compared with 17,997 using the GFR, a difference of more than 8000 expected births, three-quarters of them in the town of Bobo-Dioulasso. This method also introduces a bias, due to the fact that the GFR calculated in the DHS is weighted to the extent of more than half by women living in the capital, where it is more than probable that fertility is among the lowest in the country. The weight of this part of the sample can thus reduce the GFR for all urban areas, and is no doubt out of line with the situation in smaller towns. While for Bobo-Dioulasso, with a population of over 300,000, the resulting error may not be serious, it may well be considerable for smaller towns. To apply the GFR for rural areas to these towns, however, does not seem to offer a solution, for this would undoubtedly produce a much larger error (by way of an over-estimate) than applying an urban GFR which might be below the true figure.

Establishing the mother’s area of origin – urban or rural? – also presents problems. Bogandé and Diapaga were regarded by those carrying out the study as rural areas, although

they have a functional hospital. All women living in these “towns” were recorded as resident in a rural area, although under the definition recommended in the UON protocol women living within 5 (or 15) km of a health structure should be classed as resident in an urban area.

Biases due to inexact diagnosis

Only two of the six structures covered by the study have a resident gynaecologist; the diagnostic ability of the surgeons is perhaps less than that of the gynaecologists; and it is possible, therefore, that there may have been errors in deciding on the indication for an intervention. This type of bias is difficult to evaluate a posteriori, and since the person carrying out the study and the supervisor are not themselves gynaecologists this bias may not have been checked during the collection of data.

Biases in collection of data

The most important bias of this kind relates to the contamination of the numerator for the mother’s area of origin. It is possible that some women on admission to hospital give a temporary place of residence, usually near the hospital. This type of bias is probably greater in the case of women who know that they may be faced with problems in giving birth, either because of their antecedents or because some problem has been detected at the antenatal stage. Although it is impossible in the present study to check the mother’s exact address, it would be quite possible in a future study to record this information more accurately, taking greater care in noting the address and checking it against the documents (e.g. the carnet de santé) issued to the mother during the antenatal consultations.

Results

We shall begin by describing the overall results concerning the distribution of interventions, indications and deficits by district. We shall then undertake a more specific analysis designed to bring out differences between types of area and to establish the levels and causes of maternal and infant mortality. Finally the data from the “women” file will be linked with information on the human and material resources of the health structures and their level of activity.

The tables and figures presented are constructed by reference to the categories of interventions and indications shown in **Table 4**. We shall be more particularly concerned with major obstetric interventions (893 cases), whether for absolute maternal indications (605 cases) or non-absolute indications (288 cases).

Major obstetric interventions

A total of 893 major obstetric interventions were recorded in 1998 in the six hospitals included in the study (**Table 5**). The average ratio of MOIs per 100 expected births for the whole of the area covered by the study was 0.6. There was a considerable disparity between urban and rural areas, with 2.3 MOIs per 100 expected births in urban areas compared with only 0.4 in rural areas. Contamination of urban areas by rural areas may explain part of this difference; but the full extent of the disparity must be due to the fact that more than a quarter of the women claiming to reside in a town must in reality have been living in a rural area.

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

	Urban area		Rural area		Total	
	Number	(%)	Number	(%)	Number	(%)
Caesarean	320	77.3%	330	68.9%	650	72.8
Hysterectomy	4	1%	10	2.1%	14	1.6%
Laparotomy	71	17.1%	101	21.1%	172	19.3%
Version-extraction	10	2.4%	18	3.7%	28	3.1%
Craniotomy	9	2.2%	20	4.2%	29	3.2%
Total	414	100%	479	100%	893	100%

Caesareans represent 73% of the major obstetric interventions performed. Here too a difference can be observed between urban areas (77% of caesareans) and rural areas (69% of caesareans). Hysterectomies, almost always performed for uterine rupture, are twice as frequent in rural areas. Since the numbers are small, it is not possible to offer any detailed explanation.

Laparotomies are also more frequent in rural areas, but the indications for this operation differ in the two types of area: in urban areas only a quarter of laparotomies are performed for the suture of a uterine breach, while in rural areas this indication accounts for almost three-quarters of the indications for laparotomy. Contrariwise, laparotomies for ectopic pregnancies are much more frequent in urban areas (70% of laparotomies in urban areas compared with 25% in rural areas). Less invasive interventions like internal version and craniotomy appear to be more frequently performed in rural areas.

The caesarean rate per 100 expected births is 1.8 in urban areas and 0.3 in rural areas.

Women who have not had a major obstetric intervention

Of the 47 women in this category (**Table 4**) 46 died, 37 of them before any intervention.

Absolute maternal indications

There were altogether 630 absolute maternal indications (**Table 6**) out of the total number of cases recorded (MOI, non-MOI and maternal deaths). The commonest indications (55%) were foeto-pelvic disproportions, with a wide difference between urban and rural areas (66% in urban areas and 48% in rural areas). The indications uterine rupture, abnormal presentation and foeto-pelvic disproportion, within the wider category of obstructed labour, account for 90% of the total, with very little difference between urban and rural areas. On the other hand the gravity of cases differs very considerably according to type of area, with complications occurring in almost a quarter of the cases of uterine rupture in rural areas and in only 9% of cases in urban areas. This is no doubt the result of difficulty of access to health structures in rural areas, leading to delay in coming under hospital care. It is also possible that in some hospitals there are not always doctors on duty and that some uterine ruptures may occur when the patient is in hospital.

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

	Urban area		Rural area		Total	
	Number	(%)	Number	(%)	Number	(%)
Uterine rupture	20	8.2%	83	21.4%	103	16.3%
Transverse, facial and front presentation	39	16%	78	20.2%	117	18.6%
Foeto-pelvic disproportion and pre-rupture	161	66.3%	185	47.8%	346	54.9%
Ante-partum haemorrhages	15	6.2%	30	7.8%	45	7.1%
Post-partum haemorrhages	6	2.5%	10	2.6%	16	2.5%
Severe haemorrhages	2	0.8%	1	0.3%	3	0.5%
Total	243	100%	387	100%	630	100%

Haemorrhages are almost as frequent in both types of area, and seem, in relation to the numbers of expected births (see **Table 10** and **Table 11**), very few in number in both. The incidence of haemorrhages per 100 expected births is 0.12 in urban areas and 0.03 in rural areas, whereas a study carried out in six large African towns between 1994 and 1996 showed that haemorrhages due to placenta praevia alone had a prevalence of 0.25 per 100 expected births. While distance from health structures for women living in rural areas is undoubtedly one factor in explaining these low rates, this cannot be the case in urban areas, where by definition the hospital is accessible. Other factors (financial accessibility, quality of reception in hospital, difficulty in detecting problems, procedure for referral from primary level of health care, etc.) must therefore be considered.

Non-absolute maternal indications

Table 7 shows the distribution of non-absolute maternal indications according to the mother's area of residence. Almost all these women had had a major obstetric intervention (93%) or died before any intervention (6%). The table does not include non-AMI cases which had had non-surgical treatment (non-MOI). It does not, therefore, give a complete picture of the frequency of complications which may occur during childbirth.

In both urban and rural areas ectopic pregnancy and foetal distress are the two principal non-AMI causes for a major obstetric intervention (**Table 7**). The most significant differences between types of area are in favour of urban areas for foetal distress (8.9 points) and antecedents of caesareans (4.9 points) and in favour of rural areas for dynamic dystocias (4.5 points). Since caesareans are more frequently performed in urban areas, it is natural that interventions for antecedents of caesareans should be commoner in such areas. As is generally the case, problems endangering the life of the child, such as foetal distress, are also found more frequently in urban areas.

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

	Urban area		Rural area		Total	
	<i>Number (%)</i>		<i>Number (%)</i>		<i>Number (%)</i>	
Ectopic pregnancy	51	26.7%	28	24.8%	79	26.0%
Foetal distress	49	25.7%	19	16.8%	68	22.4%
Antecedent of C-section	16	8.4%	4	3.5%	20	6.6%
Dynamic dystocia	15	7.9%	14	12.4%	29	9.5%
Eclampsia	15	7.9%	7	6.2%	22	7.2%
Other cause	14	7.3%	15	13.3%	29	9.5%
Problem connected with cord	13	6.8%	10	8.8%	23	7.6%
Other presentation	7	3.7%	3	2.7%	10	3.3%
Obstructed labor for other cause	4	2.1%	4	3.5%	8	2.6%
Breac presentation	4	2.1%	3	2.7%	7	2.3%
Other ante-partum haemorrhage	1	0.5%	0		1	0.3%
Toxemia, pre-eclampsia	1	0.5%	3	2.7%	4	1.3%
Puerperal infection	1	0.5%	1	0.9%	2	0.7%
Other obstetrical antecedent			2	1.8%	2	0.7%
Sub-total	191	100%	113	100%	304	100%
Cause not mentioned			6	5%	6	1.9%
Total	191	100%	119	100%	310	100%

When rates of incidence of each indication in relation to expected births in each type of area are calculated (**Table 8**) the ratio of urban to rural rates gives a rather different picture of the differences between types of area. This table gives a better impression of the inequalities between types of area in accessibility to obstetric care. While the antecedents of caesareans and

foetal distress are still much more frequent in urban areas, dynamic dystocias are 8 times more frequent and problems related to the cord 9 times more frequent in such areas, whereas in the previous table these two indications seemed commoner in rural areas. All other indications are between 7 and 17 times more frequent in urban than in rural areas.

Table 8. NON-ABSOLUTE MATERNAL INDICATIONS: RATIOS OF URBAN RATES TO RURAL RATES, BURKINA FASO, 1998

Indication	Urban rate (‰ EB)	Rural rate (‰ EB)	Ratio U/R
Antecedent of C-section	0.89	0.03	28
Foetal distress	2.72	0.15	18
Other presentation	0.39	0.02	17
Eclampsia	0.83	0.05	15
Ectopic pregnancy	2.83	0.22	13
Breach presentation	0.22	0.02	9
Problem connected with the cord	0.72	0.08	9
Dynamic dystocia	0.83	0.11	8
Obstructed labor for other cause	0.22	0.03	7
Puerperal infection	0.06	0.01	7
Other cause	0.78	0.12	7
Toxemia, pre-eclampsia	0.06	0.02	2
Other ante-partum haemorrhage	0.06	0.00	

Eclampsias and ectopic pregnancies, which call for rapid obstetric care if the mother's life is to be saved, are much more frequent in urban areas, suggesting that difficulties of geographical access to health structures for women living in rural areas prevent patients suffering from this type of pathology from obtaining emergency obstetric care in time and that many women probably die at home or during transport to hospital.

Major obstetric interventions for absolute maternal indications

The MOI/AMI rate per 100 expected births is 1.3 in urban areas and 0.3 in rural areas. There are thus on average 4.3 times more MOI/AMI in urban areas. The difference is still more marked if only caesareans for AMI are considered: these are 5.4 times more frequent in urban areas.

Table 9. MAJOR OBSTETRIC INTERVENTIONS FOR ABSOLUTE MATERNAL INDICATIONS ACCORDING TO TYPE OF AREA, BURKINA FASO, 1998

Urban areas

	C-section	Hysterec-tomy	Laparo-tomy	Version extraction	Cranio-tomy	Total	Mother died before intervention
Uterine rupture		3	17			20	
Transverse, facial and front presentation	32			7		39	
Foeto-pelvic disproportion and pre-rupture	152			1	7	160	1
Ante-partum haemorrhages	13					13	1
Post-partum haemorrhages						0	6
Severe haemorrhages		1				1	1
Total	198	4	19	8	7	233	9

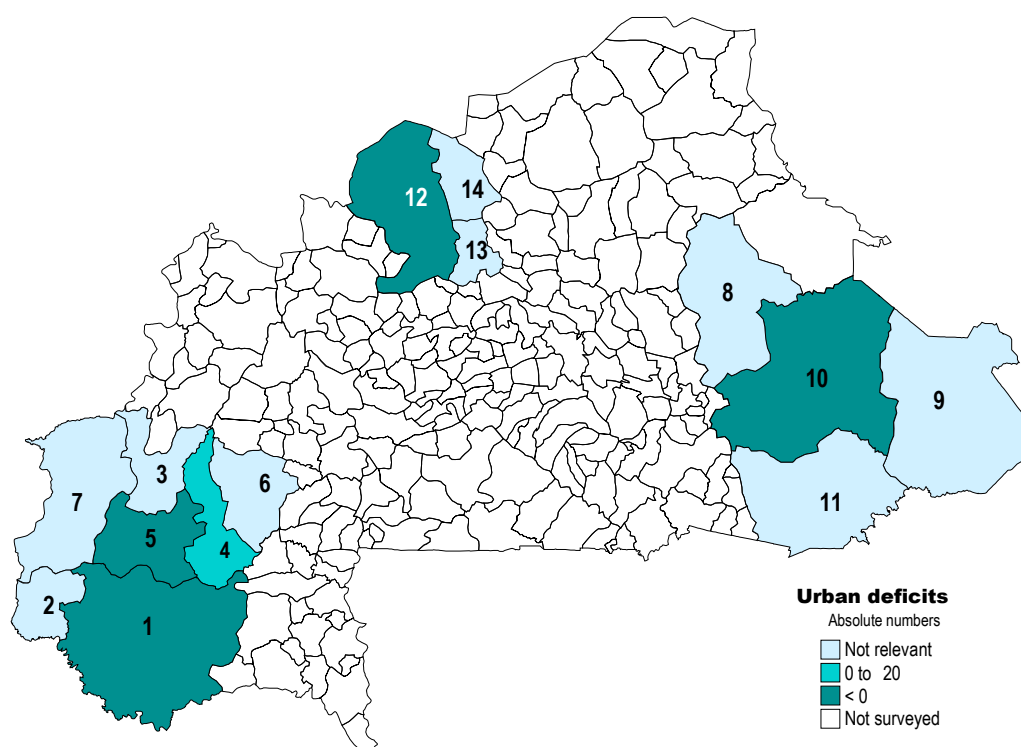
Rural areas

	C- section	Hysterec tomy	Laparo tomy	Version extraction	Cranio tomy	Total	Mother died before intervention
Uterine rupture		9	73			82	1
Transverse, facial and front presentation	54			14	9	77	1
Foeto-pelvic disproportion and pre- rupture	177				7	184	1
Ante-partum haemorrhages	28			1		29	1
Post-partum haemorrhages						5	5
Severe haemorrhages						1	1
Total	259	9	71	15	16	372	10

Deficits in urban areas

Deficits everywhere are low and indeed sometimes negative, no doubt because of urban/rural contamination, which in view of the small number of MOI/AMI expected can produce considerable variations in deficits even if it is quantitatively negligible. Only one district, DS 15, has a larger deficit in both absolute and relative terms (23%). All the health structures, therefore, seem to be performing adequately their role of dealing with obstetric emergencies for women living in the towns in which they are situated. The women of Banfora frequently (almost 40%) go directly to the national hospital centre in Bobo-Dioulasso in the event of a problem. It is quite possible, however, and indeed probable, that these women decided to live near the hospital centre before the birth; but this does not in any way reduce the attractive power of this large hospital centre.

Figure 2. DEFICITS IN ABSOLUTE NUMBERS OF MAJOR OBSTETRIC INTERVENTIONS FOR ABSOLUTE MATERNAL INDICATIONS IN URBAN AREAS, BURKINA FASO, 1998



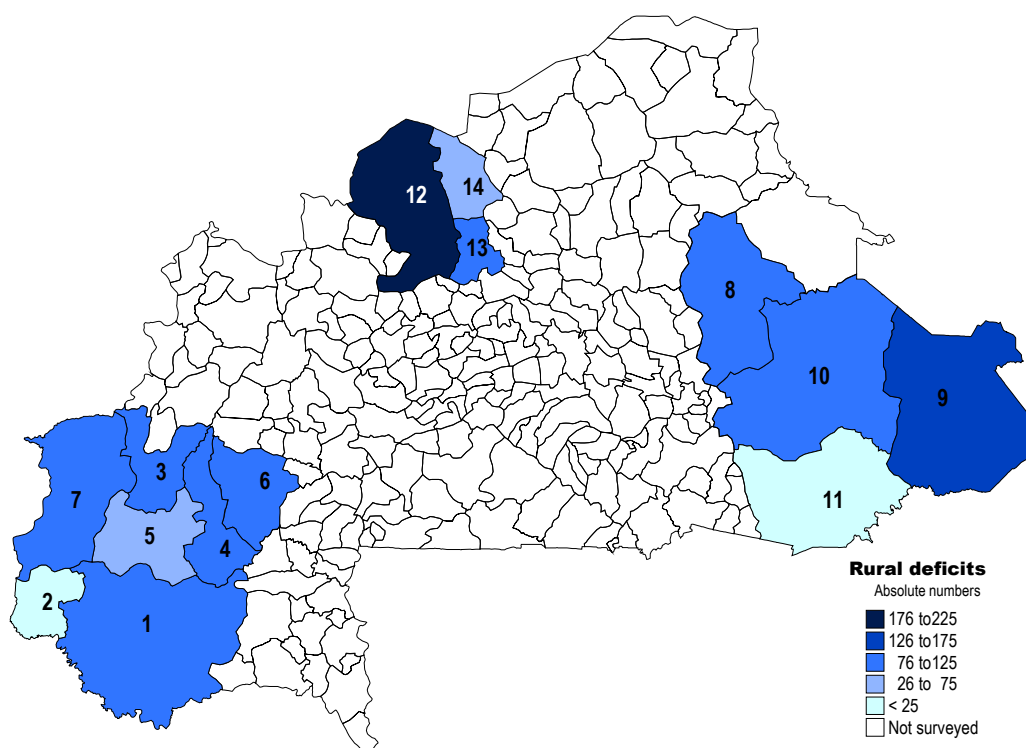
The numbering of district is as in **Table 10**

Table 10. DEFICITS IN MAJOR OBSTETRIC INTERVENTIONS FOR ABSOLUTE MATERNAL INDICATIONS BY DISTRICT, URBAN AREAS, BURKINA FASO, 1998

Region	N°	District	Expected births	MOI for AMI		Deficits (%)
				Expected	Performed	
Banfora	1	BANFORA	1,793	23	25	-2 (-7%)
	2	SINDOU		Not relevant		
	3	DANDÉ		Not relevant		
Bobo-Dioulasso	4	DS15	5,513	72	55	17 (23%)
	5	DS22	7,798	101	110	-9 (-9%)
	6	HOUNDE		Not relevant		
	7	ORODARA		Not relevant		
Fada-N'Gourma	8	BOGANDÉ		Not relevant		
	9	DIAPAGA		Not relevant		
	10	FADA	1,053	14	16	-2 (-17%)
	11	PAMA		Not relevant		
Ouahigouya	12	Ouahigouya	1,840	24	27	-3 (-13%)
	13	SEGUENEGA		Not relevant		
	14	TITAO		Not relevant		
TOTAL			17,997	234	233	1 (0,4%)

Deficits in rural areas

Deficits are everywhere smaller in rural areas. In absolute figures, only the Pama district has a deficit of less than 50 interventions, but the number of MOI/AMI expected is only 28. In relative terms the lowest deficit is in Banfora (67%), and 8 districts have deficits of 80% or more.

Figure 3. DEFICITS IN ABSOLUTE NUMBERS OF MAJOR OBSTETRIC INTERVENTIONS FOR ABSOLUTE MATERNAL INDICATIONS IN RURAL AREAS, BURKINA FASO, 1998

The numbering of district is as in Table 11

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

Region	N°	District	Expected births	MOI for AMI		Deficits (%)
				Expected	Performed	
Banfora	1	BANFORA	10,098	131	43	88 (67%)
	2	SINDOU	4,953	64	7	57 (89%)
Bobo-Dioulasso	3	DANDÉ	9,857	128	39	89 (70%)
	4	DS15	8,113	105	16	89 (85%)
	5	DS22	4,118	54	16	38 (70%)
	6	HOUNDÉ	8,526	111	19	92 (83%)
	7	ORODARA	10,480	136	41	95 (70%)
Fada-N'Gourma	8	BOGANDÉ	11,706	152	42	110 (72%)
	9	DIAPAGA	12,425	162	25	137 (85%)
	10	FADA	12,808	167	51	116 (69%)
	11	PAMA	2,160	28	5	23 (82%)
Ouahigouya	12	Ouahigouya	19,588	255	52	203 (80%)
	13	SEGUENEGA	7,034	91	10	81 (89%)
	14	TITAO	5,900	77	6	71 (92%)
TOTAL			127,766	1,661	372	1,289 (78%)

It will be seen that while all the hospitals seem to be performing reasonably well in dealing with obstetric emergencies from urban areas they provide poor coverage in rural areas.

The districts with the “least bad” coverage are those in which the hospitals are situated. The deficits observed in Ouahigouya, however (80%), point to a serious problem of access to care, the principal cause of which can hardly be distance, since the district is not a particularly large one.

All the hospitals except the one in Banfora, which has the lowest deficit in rural areas, have an ambulance; but without an organised system for referral and evacuation this does not seem to have a positive impact on the rapid handling of obstetric emergencies for women in rural areas.

Clearly, therefore, there is a considerable disparity between urban and rural areas in a woman's chances of reaching hospital in a case of emergency. As will be shown by the analysis of mother and child deaths, the disparity does not stop there, and even if a woman from a rural area has actually reached hospital her chances of survival, and those of her child, are much less than those of a woman living near the hospital.

Uterine ruptures

Table 12. UTERINE RUPTURES: TYPES OF INTERVENTION AND NUMBER OF MATERNAL DEATHS ACCORDING TO TYPE OF AREA, BURKINA FASO, 1998

	Urban area (233 MOI / AMI)		Rural area (372 MOI / AMI)		Total	
	Number	Death	Number	Death	Number	Death
Hysterectomy	3	0	9	1	12	1
Laparotomy	17	4	73	18	90	22
Mother died before intervention	0	0	1	1	1	1
Total	20	4	83	20	103	24

Table 9 and **Table 12**, together with an examination of the rates of incidence per 100 expected births of problems of obstructed labour, point to the hypothesis of a major problem of accessibility to hospital structures, whatever the cause, by women in rural areas.

It will be seen:

- that problems of obstructed labour which have led to an MOI (abnormal presentation or foeto-pelvic disproportion) represent 1.2% of expected births in urban areas, or 4.4 times as many as in rural areas (0.27% of expected births);
- that the rate of incidence (per 100 expected births) of uterine ruptures reaching hospital is 1.7 times higher in urban areas (0.11 UR/100 EB) than in rural areas (0.06 UR/100 EB);
- that this indication (obstructed labour) is associated with a uterine rupture in 9% of cases in urban areas against 24% of cases in rural areas; and
- that in cases of uterine rupture one in 5 mothers dies in urban areas and one in 4 in rural areas (the commonest cause of death in both types of area being a post-operative haemorrhage).

Thus women living in rural areas are later, for whatever reason (problems of accessibility, acceptability of recourse to health services, inadequate diagnostic competence in prAMlry-level health structures, etc.), in reaching a health structure. This slowness of recourse to the hospital of referral must undoubtedly lead to a large number of maternal and neonatal deaths at home or in health centres. It is probably responsible for the high fatality rate in cases taken into hospital care at too late a stage. **Table 12** also shows that hysterectomies are rarely performed in both urban and rural areas, in spite of the apparent gravity of the cases admitted to hospital (a quarter of these women die, most often from haemorrhage). This is quite as likely to be due to a diagnostic failure to determine the gravity of the case and decide on the intervention required as to the wider problem of the acceptability of an intervention finally terminating the mother's reproductive life.

Intra-hospital maternal deaths

The intra-hospital maternal mortality revealed by the data in the "women" file is dramatic: of the 630 women recorded in the file and admitted with an absolute maternal indication 64, or 10%, died before, during or after an intervention. Referring to the data collected in the "health formations" questionnaire, which relates to all births in these hospitals and to all maternal deaths linked directly or indirectly with the birth, we observe an intra-hospital maternal mortality of 1.8%.

This high maternal mortality is found in all the hospitals included in the study – in the Bobo-Dioulasso hospital centre, where intra-hospital mortality (for AMI) in the "women" file is 7.3%, and in the three regional hospitals (Ouahigouya, Banfora and Fada), with intra-hospital maternal mortality of 18.4%, 13% and 9% respectively. The Ouahigouya hospital, incidentally, the only one of the three regional hospitals with a full-time gynaecologist, has an intra-hospital maternal mortality for all causes (number of maternal deaths/ number of births in the hospital) of 7.6%, or more than 4 times the average for all the hospitals.

One explanation of the "better" results in Bobo-Dioulasso, apart from the fact that it is a national hospital, is the high proportion of urban population covered by this hospital. More than half its patients live in the town, whereas in the case of the regional hospitals the population covered, or presumed to be covered, is predominantly rural (92–93%). The differences in mortality may, therefore, be partly explained by distance from the hospital; but the fact remains that this maternal mortality is dramatic and that there must undoubtedly be questions about the quality of care provided by the hospital.

Table 13. INTRA-HOSPITAL MATERNAL DEATHS ACCORDING TO INDICATION (MOI AND NON-MOI), BURKINA FASO, 1998

	Urban area		Rural area	
	Number	(%)	Number	(%)
Uterine rupture	4	23%	20	43%
Transverse, facial and front presentation			4	9%
Foeto-pelvic disproportion and pre-rupture	3	18%	10	21%
Ante-partum haemorrhages	2	12%	3	6%
Post-partum haemorrhages	6	35%	9	19%
Severe haemorrhages	2	12%	1	2%
Total AMI	17	100%	47	100%
AMI	17	55%	47	73%
Non-AMI	14	45%	17	27%
Total AMI et Non-AMI	31	100%	64	100%

Deaths following an absolute maternal indication

In rural areas (**Table 13**) uterine ruptures are the principal cause of maternal deaths, followed by foeto-pelvic disproportions, usually from a post-operative infection, and post-partum haemorrhages. In urban areas the same three causes are also responsible for almost 80% of deaths, but the principal cause is post-partum haemorrhage, followed by uterine rupture and foeto-pelvic disproportion.

Ante- and post-partum haemorrhages, which are rapidly fatal, are much more frequent in rural areas. In such areas it is probable that where the death occurs in the patient's home she has not had time to reach a health structure and dies before receiving hospital care.

Deaths following a non-absolute maternal indication

In urban areas half the maternal deaths result from an infection, the others being due to hypertensive and haemorrhagic complications. In rural areas, on the other hand, haemorrhages predominate (half of the deaths whose cause is known: for 5 of the 17 deaths notified the cause is not stated), while infection and hypertension together account for only a quarter of the deaths whose cause is known.

Table 14. INTRA-HOSPITAL MATERNAL DEATHS ACCORDING TO INTERVENTION FOR ABSOLUTE MATERNAL INDICATION, ACCORDING TO TYPE OF AREA, BURKINA FASO, 1998

	Urban area		Rural area	
	Number	(%)	Number	(%)
Caesarean	2	29%	14	42%
Hysterectomy	1	14%	1	3%
Laparotomy	4	57%	18	55%
Version – extraction				
Craniotomy				
Total MOI	7	100%	33	100%
MOI	7	41%	33	70%
Other intervention	1	6%	4	9%
Mother died before intervention	9	53%	10	21%
Total	17	100%	47	100%

In both urban and rural areas the intervention most frequently associated with a maternal death is laparotomy for uterine rupture. It is to be noted that in urban areas more than half the deaths caused by an AMI occur before any intervention, while in rural areas the proportion is only 21%. This might appear to be in contradiction with the hypothesis of late recourse to health structures in rural areas, which in theory should lead to a higher number of deaths before intervention. It is reasonable to suppose, however, that while in urban areas a late decision means that the woman reaches hospital too late for any intervention to be performed the time taken to reach a health structure in rural areas is such that mothers die at a much earlier stage, before reaching hospital.

Table 15. MATERNAL DEATHS AFTER MOI ACCORDING TO TYPE OF INDICATION (AMI OR NON-AMI) ACCORDING TO TYPE OF AREA, BURKINA FASO, 1998

	AMI			Non AMI		
	Number of MOI	Number of deaths	(%)	Number of MOI	Number of deaths	(%)
Urban	233	7	3%	181	4	2.2%
Rural	372	33	8.9%	107	5	4.7%
Total	605	40	6.6%	288	9	3.1%

Among women living in urban areas, who have more major obstetric interventions for non-absolute maternal indications than those living in rural areas, there is practically no difference in mortality rates according to type of indication. For women in rural areas, on the other hand, who have fewer MOIs for non-AMI, the mortality for absolute maternal indications is almost twice as high as for non-absolute maternal indications. The differences in mortality rates between types of area are greater for AMI than for non-AMI.

Child deaths

Early perinatal mortality also reaches dramatic levels in both urban and rural areas. In rural areas, in spite of the operative treatment given to the mother, almost half the children die in utero or within 24 hours of birth (**Table 16**).

Table 16. NUMBER OF CHILDREN STILLBORN AND DYING WITHIN 24 HOURS OF AN MOI ACCORDING TO TYPE OF INDICATION AND AREA, BURKINA FASO, 1998

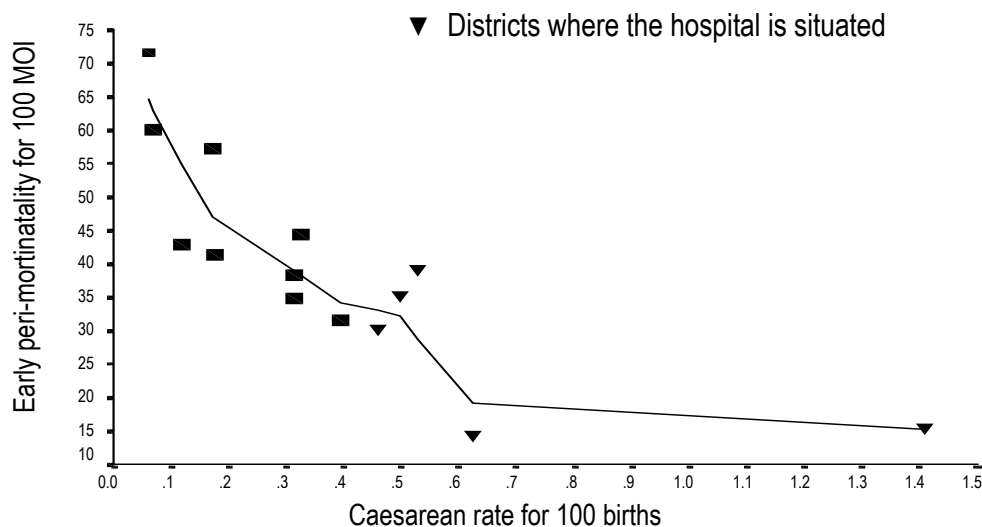
	AMI			Non AMI			Total		
	Number of MOI	Number of deaths	(%)	Number of MOI	Number of deaths	(%)	Number of MOI	Number of deaths	(%)
Urban	233	49	21%	181	17	9.4%	414	66	16%
Rural	372	186	50%	107	19	17.8%	479	205	43%
Total	605	235	39%	288	36	12.5%	893	271	30.3%

Stillbirths account for 80% of child deaths in urban areas and 91% in rural areas. No doubt it is often too late to save the child's life, and it may be supposed that a late decision to go to a health structure in the case of a birth problem is responsible for this. The question must still be asked, however, why women in urban areas, where distance from a health structure is not a problem, are so slow to seek emergency obstetric care.

Figure 4 shows a clear relationship between caesarean rate and early perinatal mortality, which falls from 65 to 30% when the caesarean rate reaches 0.5 per 100 expected births and falls sharply (from 30 to 20%) when the rate increases from 0.5 to 0.6. Beyond 0.6 caesareans per 100 expected births the benefits in terms of lives saved are much smaller. The two districts which have the lowest early perinatal mortality (between 14 and 15 child deaths per 100 MOIs) are "covered" by the national hospital centre in Bobo-Dioulasso. The other districts which have a

surgical centre also have better results. Nevertheless many children die there too, and caesarean rates are everywhere lower than 1% of expected births. Many of the child deaths are “avoidable”, particularly in Bobo-Dioulasso and Ouahigouya, where respectively a third and a fifth of such deaths occur, when the mother comes from an urban area, within 24 hours of the birth. Over all, “avoidable” deaths account for 14% of early perinatal mortality. Once again the disparity between urban and rural areas is evident, with 20% of avoidable deaths in urban areas and 9% in rural areas.

Figure 4. STILLBIRTHS AND NEONATAL MORTALITY WITHIN 24 HOURS OF BIRTH (PER 100 MOI) AMONG WOMEN WHO HAVE HAD AN MOI (CAESAREAN AND MOI/AMI) ACCORDING TO CAESAREAN RATE, BURKINA FASO, 1998



Of course this early perinatal mortality includes children dying because of a uterine rupture cases in which it is usually too late to save the child, given that these ruptures take place before admission to hospital. However foeto-pelvic disproportions and abnormal presentations represent respectively 23% and 29% of the causes of child deaths, and in such cases a caesarean, if carried out in time, can save the child.

Work load and resources

The coverage of health services in the regions included in the study is not very good, with only 6 functional structures for a population of 3 million distributed over a very large area. This falls below the ratio of one health structure per 300,000 inhabitants recommended by WHO, which in any case is not relevant in Burkina Faso in view of the difficulties of access to the hospitals.

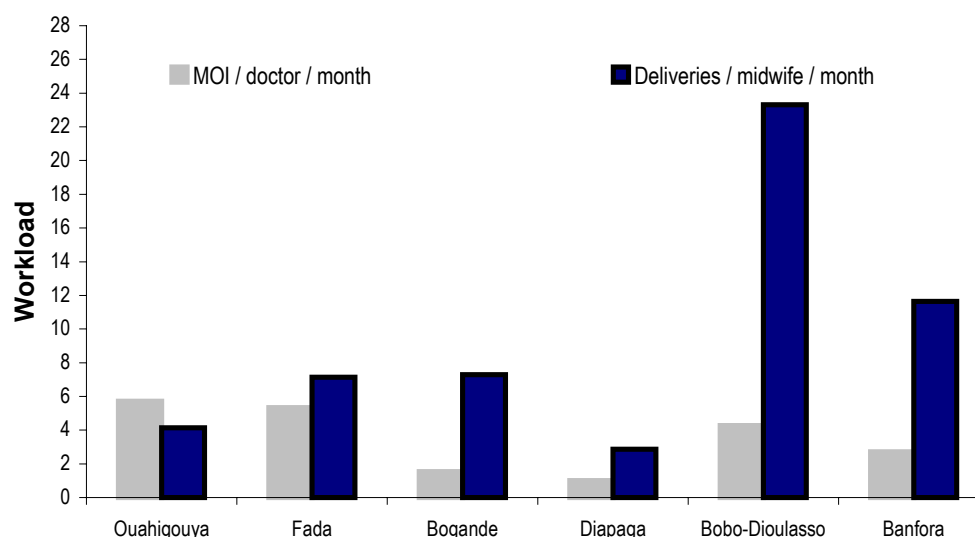
The proportion of hospital confinements is low everywhere except in Banfora, Bobo-Dioulasso and Fada, which have regional hospitals. The regional hospital in Ouahigouya, which has a gynaecologist on the staff, has the highest proportion of MOIs in relation to total births but one of the lowest proportions of such interventions for absolute maternal indications (69%).

Table 17. VOLUME OF BIRTHS AND MAJOR OBSTETRIC INTERVENTIONS PER HEALTH FORMATION ACCORDING TO THE STATUS OF THE FORMATION, BURKINA FASO, 1998

Hospital	Status of hospital	Expected births (EB) per district	Intra-hospital deliveries Number and % of EB	MOI	
				Number and % of intra-hospital deliveries	Number and % of MOI/AMI
Banfora	Régional	11,891	1,535 (13%)	65 (4,2%)	49 (75%)
Bobo-Dioulasso	National	25,542	3,357 (13%)	514 (15,3%)	322 (63%)
Bogande	CMA	11,706	350 (3%)	37 (10,6%)	29 (78%)
Diapaga	CMA	12,425	172 (1,4%)	12 (7%)	10 (83%)
Fada	Régional	13,861	1,113 (8%)	128 (11,5%)	100 (78%)
Ouahigouya	Régional	21,428	516 (2,4%)	137 (26,6%)	95 (69%)
Total		96,853	7,043 (7,3%)	893 (12,7%)	605 (68%)

The work loads of medical and paramedical personnel are nowhere excessive (**Figure 5**). There are, however, two problems. The first is the lack of a gynaecologist in most of the health formations, obstetric interventions being performed by surgeons or specially trained generalists, who are perhaps less skilled in performing bloodless obstetric interventions (forceps, vacuum extractors) and may not have received as thorough training in the diagnosis of obstetric problems. The other concerns the hospital in Diapaga, where there is only one doctor trained for these operations, who has thus to provide a 24-hour service throughout the year on his own.

In the large regional hospitals the gynaecologists or surgeons perform more than 2 major obstetric interventions per month. The situation is different in the two medical centres with surgical theatres in Bogandé and Diapaga, where there could in theory be expected to be many more cases requiring such interventions (on the referral rate used here, between 13 and 14 MOI/AMI per month are to be expected in these structures), thus enabling the surgeons to maintain their skills by more frequent use.

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

The workload of midwives (who are not the only staff to carry out deliveries, each structure also having auxiliary accoucheuses and matrones) is also very low except in Bobo-Dioulasso. In most hospitals, indeed, there is a virtual plethora of staff (between 5 and 11 specialised midwives

per structure), except in the Diapaga and Bogandé medical centres, which have only one specialised midwife, the others being auxiliary accoucheuses.

4. UTILISATION OF RESULTS

Retro-information

The collection of data for part of the country took place in late 1999 and early 2000. In view of the decision at the end of 2000 to extend the study to the whole of the country national and regional retro-information discussions have not yet taken place.

It is to be regretted that the retro-information process has not been initiated, even on a partial basis, since it might have been useful to the study team, and in particular to those collecting the data, in helping to improve the methodology used in the field. It might, for example, have drawn attention to the value of involving staff working in the field in the collection of data, which did not happen during the first phase of the study, or of making the project known to those concerned with maternal health at different levels of the health pyramid.

Perception

Methodological note

During the “research” part of the UON study the plan is to interview key personnel involved in maternal health and/or in decisions on health policy in the wider sense. This includes not only staff of the Ministry of Health at national and regional level but also representatives of women’s organisations, professional associations, international organisations and bilateral cooperation organisations. These criteria for the selection of interviewees were observed; but almost all the persons questioned, even those belonging to international organisations, were Burkinabés and had for the most part previously worked in the Ministry of Health. This has certain disadvantages: for example it does not offer an outside view of the country’s health policy and lacks the detachment which can be useful in judging its appropriateness. Moreover, since these bodies were usually also providers of funds, interviews of persons “nearer the decision-making power on the release of funds” could have provided an opportunity for making them more aware of the value of such a study and the benefits which could be drawn from it.

Results

The interviews carried out did little to increase understanding of the study in Burkina Faso. A disturbing discovery was that a regional director of health in one of the regions covered by the study was unaware that it was being carried out in his region.

Only those concerned in the project, at the Ministry of Health and among the providers of funds, were informed of the study; but some of them seem not to have understood the concept of Unmet Obstetric Needs. And while some are able to appreciate the value of this type of study (for example the advantage of its simplicity and reproducibility), most of them are often content merely to repeat the arguments developed in the basic UON modules.

5. CONCLUSION

In recent years maternal health has become an essential feature of Burkina Faso’s health policy. The establishment in 1997 of a ministry responsible for advancing the interests of women, the Ministère de la Promotion de la Femme, which seems to want to approach the problem of maternal health in a wider context, was a particularly notable initiative. It is concerned not only with care for pregnant women but also with improving the position of women in its many aspects, including the important problem of sexual mutilations.

It appears, however, that the policies developed for the purpose of providing better care for obstetric problems are still far from being effective. The extent of health service coverage is still so limited that a considerable proportion of the population still has not sufficiently rapid access to care in a health structure. Above all the present study will draw attention to a problem of which all decision-makers in this field are certainly well aware – the problem of accessibility to care due to the lack of health structures capable of dealing with obstetric emergencies. This study demonstrates clearly the existence of this problem; but it also reveals another more serious problem, the levels of maternal and perinatal mortality in urban areas, in spite of the fact that these areas have hospitals equipped with adequate human and material resources.

During the retro-information process, therefore, it will be essential not to focus attention solely on the specific problems observed in rural areas but also to consider the causes of such high maternal and perinatal mortality rates in towns.

ANNEXE 1: THE "WOMAN" QUESTIONNAIRE

Date of survey ____/____/99 Name of interviewer _____
 Questionnaire N° _____

Qo – Region: _____ **Qoo – District/Commune:** _____

Q1 – Codification: ----- /-----/ Note the region number and the district number

Q2 - Type of health formation

- 1 = regional hospital
- 2 = district hospital
- 3 = district health centre
- 4 = others

Q3 - File number: ___/___/___/ (note the number of operating protocol)

Q4 - Name and birth name of parturient: _____

Q5 - Date of admission: ____/____/____/

Q6 - Age of parturient: _____

Q7 - Ethnie of parturient: _____

Q8 - Matrimonial status: _____

- 1 = Married
- 2 = Single
- 3 = Others

Q9 - Occupation: _____

- 1 = worker
- 2 = housewife
- 3 = trader
- 4 = office job

Q10 - Standard of living: _____

Q11 - Husband occupation: _____

- 1 = worker
- 2 = farmer
- 3 = trader
- 4 = office job

Q12 – Area of origin

Urban = health area within 15 km around CSC

Rural = health area > 15 km of CSC

1 = urban 2 = rural (CSCCom/village)

Q13 – Name of the health area of origin (health area of CSCCom/CSAR): _____

Q14 – Type of access to maternity

1 = directly 2 = referred from a health centre (from CSCCom to CSref)

3 = re-admission 4 = 1 + 3 5 = 2 + 3

Q15 - Date of intervention: ____/____/____/

Q16 – Type of intervention

- 1 = caesarean 2 = laparotomy for uterine rupture
- 3 = hysterectomy 4 = craniotomy
- 5 = version extraction 6 = others, specify

Q17 – Indication of intervention

- 1 = uterine rupture 2 = uterine pre-rupture
- 3 = placenta praevia 4 = retro-placental haematoma
- 5 = severe post-partum haemorrhage 6 = foeto-pelvic disproportion

7 = transverse presentation 8 = front presentation
9 = facial presentation with incarceration of the foetal head 10 = others

Q18 – If severe post-partum haemorrhage, specify the cause:

Q19 – If foeto-pelvic disproportion, specify

1 = narrow pelvis
2 = hydrocephalic foetus
3 = macrosomia (big foetus)
4 = others

Q20 – Result for the mother

1 = alive without complication 2 = alive with complication
3 = died 8 = not recorded

Q21 - If complication, specify: _____

Q22 – Result for child

1 = living 2 = died within 24 hours 3 = macerated stillborn
4 = fresh stillborn 5 = alive reanimated 8 = not recorded

Q23 – If mother died, specify when

1 = before intervention 2 = during intervention
3 = within 24 h after intervention 4 = 2-3 days after intervention
5 = more then 3 days after intervention 8 = not recorded

Q24– Cause of mother's death

1 = hypertensive disorder 2 = severe haemorrhage 3 = severe infection
4 = unknown 5 = uterine rupture 6 = others, specify

Q24A– If hypertensive disorder

1 = eclampsia
2 = stroke

Q24B - If severe haemorrhage

1 = retro-placental haematoma
2 = placenta praevia
3 = post-partum haemorrhage

Q25 - Length of stay: ___/___/___/

ANNEX 2: HEALTH FORMATION QUESTIONNAIRE

Date of survey ____ / ____ /99

Name of interviewer _____

Questionnaire N° _____

Identification of formation

Q1 - Region

Q2 - District/Commune

Q3 - Type of health formation

1 = regional hospital

2 district hospital

3 = district health centre

4 = others

Material resources

Q4 _ Number of maternity beds

Q5 _ Number of gynaecological and obstetrical beds

Q6 _ Total number of beds in health formation

Q7 _ Number of operating theatres

Q8 _ Number of operating theatres reserved for obstetric

Q9 _ Number of functional vacuum (mechanical)

Q10 _ Number of fontanel vacuum (electronic)

Q11 _ Number of functional forceps

Q12 _ Number of ambulances

Human resources

Medical

Q13 _ Number of gynaecologists

Q14 _ Number of surgeons

Q15 _ Number of doctors with surgical competence

Q16 _ Number of juniors (gyneco-obstetric)

Q17 _ If others, specify

Paramedical

Q18 _ Number of midwives

Q19 _ Number of nurses in obstetric

Q20 _ Number of matrones

Q21 _ Number of nurse assistants

Q22 _ Number of anaesthetists

Q23 _ Number of surgeon assistants

Activities

Q24 _ Number of admissions to maternity unit

Q25 _ Total number of deliveries

Q26 _ Including dystocic deliveries

Q27 _ Including eutocic deliveries

Q28 _ Total number of still-births

Q29 _ Total number of maternal deaths

Q30 _ Total number of caesareans

Q31 _ Total number of uterine ruptures

ANNEXE 3. LIST OF MAIN DOCUMENTS PUBLISHED BY THE UON STUDY IN BURKINA FASO

Ministry of Health, Burkina Faso

Mars 2001, Ministère de la Santé, Besoins Obstétricaux Non Couverts, Expérience du Burkina Faso. Document provisoire, 44 p.

Décembre 2000, Ouedrago I., Approche des Besoins Obstétricaux Non Couverts pour les Interventions Obstétricales Majeure. Documentation des politiques, des stratégies, et des pratiques de lutte contre la mortalité maternelle. Rapport final, 38 p.

Février 2000, Ouedrago I., Approche des Besoins Obstétricaux Non Couverts pour les Interventions Obstétricales Majeure. Documentation des politiques, des stratégies, et des pratiques de lutte contre la mortalité maternelle. Proposition de service. 14 p.

Coordination and management team

Janvier 2000, Derveeuw M., Rapport de mission au Burkina Faso, 7-15 janvier 2000, 8 p.

Juillet 1999; Derveeuw M., Observation sur l'introduction de l'approche des Besoins Obstétricaux Non Couverts au Burkina Faso (Mission du 1 juillet au 13 juillet), 4 p.