

# Perinatal Deaths in Rural a Health Area, Case of the Health District of Kadiolo, Mali

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## Abstract

The perinatal mortality is a public health issue in developing countries. In fact, the perinatal death rate seems the highest in a Malian rural area. The objective of this work was to study the perinatal mortality in a rural area of Mali (Kadiolo). **Methodology:** It was a cross-sectional descriptive study conducted in Kadiolo over 12 months. The study took place from April 1, 2016 to March 31, 2017. We have included in our study all dead fetuses in gestational age  $\geq$  28 weeks of amenorrhea (WA) or weight  $\geq$  500 grams (g) and infants died during the first week of life. Mothers who have experienced a perinatal death were included. **Results:** During the 12 months of study period, we have recorded a total of 2212 births out of which we have collected 205 perinatal deaths, a perinatal mortality rate of 205/2212 with 93 per 1000. The stillbirth rate was 152/2212 with 69‰ and the early neonatal mortality rate was 53/2212 with 24‰. The sociodemographic characteristic of the patients was: patient who has been evacuated 71.70%, unschooled 77.1%, coming out of the city Kadiolo 76%, young women 65% and patient who did not receive antenatal care 35%. **Conclusion:** Our study confirms the high rates of perinatal deaths in rural areas. The implementation of a coherent and efficient care strategy should help in reducing the still high rates.

## Keywords

Perinatal Deaths, Dystocia, Rural Environment, Mali

## 1. Introduction

Pregnancy and delivery are physiological phenomena that can be accompanied by serious complications and thus leading to maternal or perinatal mortality. The perinatal mortality (PNM) remains, in general, an under looked public health issue and less documented in Sub-Saharan Africa particularly in Mali [1] [2]. In fact, according to the World Health Organization (WHO), four million of newborns die before one-month-old among them two-third during the first week of life; and for each early neonatal death, there is delivery of at least one fresh or macerated stillborn baby. The perinatal pathologies constitute the leading cause of deaths in children under one year in developing countries [3]. In 2013 the neonatal mortality rate (NMR) was estimated to 35%, according to the report of the Malian Demographic and Health Survey (MDHS), fifth edition [4]. The neonatal mortality is a very sensitive indicator of the availability, the usage and the feasibility of treatments in perinatal health. Aware of the magnitude of perinatal and maternal mortality, the Malian authorities have adopted strategies to fight against the mortality of both mother and infant. In 1994, a national perinatal program was implemented. Its implementation on the ground has led to the organization of the Referral-Evacuation (RE) and the Counter-Referral System with the obstetrical and perinatal emergency management as a portal. This led in 2005 to the decision of free caesarean sections all over the country in order to fight against perinatal and maternal mortality. However, in our country, the scale of the problem and the importance that is focused on it is in contrast to the few works and resources devoted to it. At the national level, only MDHS estimates the perinatal mortality rate. The sanitary district in Mali constitutes the operational level of new health policies implementation. In fact, the health district of Kadiolo executes these strategies of fighting against perinatal mortality through antenatal consulting, neonatal and obstetrical emergency care, the functionality of RE, developed strategies in Reproduction Health, the integration and maintenance of community health workers. Despite those different strategies, the perinatal mortality rate is still high. To date, no study has been conducted in the circle of Kadiolo to precise the magnitude of perinatal mortality. This work aimed to study the perinatal mortality and to point out the characteristics of women victim of perinatal deaths in a sanitary structure in Malian rural area. That will permit to give orientation for preventing strategies.

## 2. Methodology

### 2.1. Description of the Study Framework

This work has been conducted in the circle of Kadiolo at the health reference center of the district of Kadiolo. It is located at 400 km from Bamako and at 10 km from the border between Mali and Ivory Coast. It's a cross-border area sharing border with Ivory Coast and Burkina Faso. **Figure 1** shows the limits on a sanitary map of Kadiolo district.



$n$  = sample size;  
 $t$  = the reliability coefficient for 95% confidence level at 1.96;  
 $m$  = error margin 3%: 0.03;  
 $p$  = prevalence of the affection (neonatal mortality of Sikasso region)  $p = 41,1\%$  = 0.0411;  $q = 1 - P = 0.958$ ,  $n = 175$  [5].

## 2.5. Data Collection

- **Data collection tools:** the data has been collected from delivery record, partograph, obstetrical files, admission records, the operative report record.
- **Data collection techniques:** For each delivery, qualitative and quantitative information were documented on the tools. Next, the data were recorded on individual sheet of survey developed for this purpose.
- **Data handling and analysis:** the data were recorded on Word processing software then analyzed on the software SPSS.20 version. Statistical analyses performed were the proportions, the Chi<sup>2</sup> with the statistical significance  $p = 0.05$ .

## 2.6. Operational Definitions

Perinatal mortality consists of stillbirths and early neonatal mortality. Indeed, it poses a problem of definition because of the variability of the lower limit of viability of the fetus according to the countries. It is in order to harmonize these definitions that the World Health Organization (WHO) recommended in 1993 that children weighing at least 500 g should be registered, or at least one gestational age equal to 22 SA or a height of at least 25 cm.

## 2.7. The Ethical Aspects of the Study

This study was validated by the Ethics Committee of the Faculty of Medicine of Bamako. The administrative heads of the health districts of Kadiolo validated the research protocol. Confidentiality and anonymity have been respected for the exploitation of patients' files.

## 3. Results

### 3.1. Frequencies

During the 12 months of study period, we have recorded a total number of 2212 of deliveries among them 205 perinatal deaths have been compiled with a perinatal mortality rate of 93‰ (205/2212). The stillbirth rate was 69‰ (152/2212) that of the early neonatal mortality rate was 24‰ (53/2212).

### 3.2. Distribution of Perinatal Mortality According to the Characteristics of Mothers and Newborn Babies (Tables 1-3)

The perinatal mortality (PNM) was more common among the age group of 20 to 34 years old (65%). We have recorded the highest number of perinatal deaths

**Table 1.** Proportion of deaths on the basis of socio-demographic factor of mothers.

Characteristics	%	n/N
<b>Age</b>		
15 - 19 years	17.6	36/205
20 - 34 years	65	133/205
35 or more	17.4	36/205
<b>Occupation</b>		
Household	92	188/205
Pupil/student	5.5	12/205
Seller/labor	2	4/205
Public servant	0.5	1/205
<b>Schooling</b>		
Non-educated	77.1	158/205
Educated	22.9	47/205
<b>Admission mode</b>		
Transported/referred	78	160/205
Come by herself	22	45/205

among household wives (92%). The non-schooling women have got more PNM (77.1%). The majority of perinatal deaths were recorded among the group of non-resident women of Kadiolo city (75.6%). In fact, 78% of referred or transported women have been concerned with PNM. Mothers with perinatal death were followed up in 64.9% of cases. The prenatal consultation was done by the matrons in 26% of the cases. Dystocia (36.5%), arterial hypertension (25.5%) and bleeding on pregnancy (20%) were the main reasons for evacuation. We found a uterine height was small for the age of pregnancy or excessive in 15.60% of cases. In 97.60% cases the amniotic fluid was stained. In fact, 87.80% of fetal presentations were the summit. The fresh stillborn babies represented 41% cases. And in 76% of cases, the gestational age (GA) was over to 34 WA. More perinatal deaths were observed during the 54.60% lane and 45.40% for the caesarean section. Obstetric complications accounted for 14.30% and among these complications uterine rupture accounted for (41%), postpartum haemorrhage (31%) and Tear of soft parts (28%).

### 3.3. Causes of Perinatal Mortality (Table 4 and Table 5)

The possible causes of perinatal deaths and the factors associated with fetal status at birth are described in **Table 4** and **Table 5** below.

The eventual causes were determined according to the international and statistical classification of diseases and health issues (ICD-10) during the analysis of obstetrical files by the staff meeting of the service. **Table 4** shows information about the causes of perinatal deaths of this study. In fact, the four deadly pathologies for fetuses and newborn babies in our study were high blood pressure and its complications (30%), acute fetal distress (23%), the neonatal infections (14.1%) and the prematurity (10%). We studied also the factors associated

**Table 2.** Proportion of perinatal deaths on the basis of clinical factor of mothers.

Characteristics	%	n/N
prenatal consultation		
0	35.1	72/205
1 - 3	57.1	117/205
≥4	7.8	16/205
Qualification of the author of prenatal consultation		
Matron	26	54/205
Qualified personnel	74	151/205
Reason of evacuation		
Dystocia	36.50	75/205
Bleeding	20.00	41/205
Preeclampsia/Eclampsia	23.50	38/205
Labor	24.00	48/205
Early rupture of membranes	1.5	3/205
Uterus high		
Delay of intra uterus growth	11.20	23/205
Excessive uterus high	4.40	9/205
Normal uterus high	84.40	173/205
Type of Bassin		
Abnormal	08.30	17/205
Normal	91.70	188/205
Amniotic liquid Aspect		
Clear	3.40	6/205
Stained	97.60	199/205
Author of delivery		
Doctor	35.10	72/205
Midwife + obstetrician nurse	64.90	133/205
Delivery way		
Vaginal	54.60	113/205
Cesarean section	45.40	92/205
Delivery complication		
Yes	14.30	29/205
No	85.70	176/205
Existence of partograph before admission		
Yes	6.30	13/205
No	93.70	192/205
Type of delivery complications		
Uterus rupture	41	12/29
Immediate hemorrhage of post-partum	31	9/29
Tear of soft parts	28	8/29

**Table 3.** Distribution of perinatal deaths on the basis of fetuses and newborn characteristics.

Characteristics	%	n/N
Perception of BDCF		
Presence	35.60	73/205
Absence	64.40	132/205
Fetus presentation		
Abnormal	12.20	25/205
Summet	87.80	180/205
State of newborns		
Fresh stillbirth	41	84/205
Macerated stillbirth	33	68/205
Early neonatal death	26	53/205
Gestational age		
28 WA to 34 WA	24	49/205
34 WA and more	76	156/205

**Table 4.** Distribution according to the eventual causes of perinatal deaths.

Causes of perinatal deaths	Number	%
high blood pressure and complications	60	29
Acute fetal distress	47	23
Neonatal infections	29	14
Anemia	21	10
Malaria	14	7
Preterm	14	7
Uterus rupture	12	6
Placenta previa	8	4
Total	205	100

with the Fetal status at birth. It was Parity  $OR_{IC95\%} = 0.96$  (0.4 - 1.9), admission mode  $OR_{IC95\%} = 1.1$  (0.5 - 2.2), delivery way  $OR_{IC95\%} = 1.3$  (0.7 - 3), qualification of the delivering agent  $OR_{IC95\%} = 1.5$  (0.7 - 3.1), prenatal consultation  $OR_{IC95\%} = 1.5$  (0.7 - 3), causes of deces perinatals  $OR_{IC95\%} = 5.4$  (2.1 - 14.4) as shown in **Table 5**.

#### 4. Commentary and Discussion

The results have been commented and discussed on the basis of literary data. In this study, the results obtained provide with four types of messages.

**Table 5.** Factors associated with fetal status at birth.

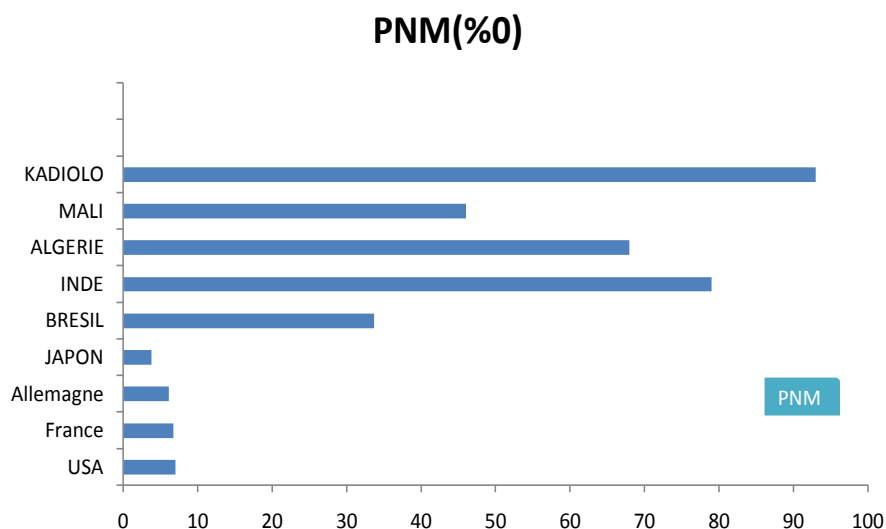
Factors	Fetal status at birth		Khi <sup>2</sup>	Oddsratio OR <sub>IC95%</sub>	p	
	Stillborn	Deces neonatal precece				
Parity	Primiparity	39	14	3	0.96 (0.4 - 1.9)	0.4
	Multiparity	113	39			
Admission mode	come from her	33	12	5.4	1.1(0.5 - 2.2)	0.2
	referred and evacuated	119	41			
delivery way	Vaginal	86	26	4	1.3 (0.7 - 2.5)	0.1
	cesarean section	66	27			
qualification of the delivering agent	midwife and obstetrician	101	40	17	1.5 (0.7 - 3.1)	0.009
	Others	51	13			
Prenatal consultation	Yes	95	38	1,4	1.5 (0.7 - 3)	0.4
	No	57	15			
Causes of perinatal death	preeclampsia and complications	55	5	14	5.4 (2.1 - 14.4)	0.000
	Others	97	48			

#### 4.1. Perinatal Mortality Rate in Kadiolo

The first message was about the rate of perinatal mortality and was 93‰. That ranks Kadiolo among the highest rural areas in Sub-Saharan Africa and in the world. We have conducted a cross sectional study with prospective collection of data during 12 months at the health center of Kadiolo. Over 2212 deliveries recorded in our service, 205 perinatal deaths have been compiled resulting to a frequency of 93 per 1000. This rate is sharply higher than that observed in developed countries [3] [6] [7] [8] (Figure 2).

In a developing country like Mali we have had a PNM rate of 93 per 1000 in Kadiolo a Malian rural area. This rate was similar to that found in the other developing countries. In fact, Dougnon, H. *et al.* in the city of Gao have found 75.28 per 1000 [9] and Traore, S. *et al.* in the referral center of the commune V of Bamako district have found 50.1 per 1000 [10]. In fact, the perinatal mortality varies from country to another and is due to the level of socio-economic development of countries. This rate reaches 20.5 per thousand in the district of Fianarantsoa II in Madagascar [11]. We have analyzed the perinatal death rate between developing countries among them Mali and advanced countries. Next, we have contrasted the rural area to urban. The perinatal mortality rate in Mali was in overall 56 per thousand in 2013 according to MDHS V [4] and 93 per 1000 in the circle of Kadiolo in 2017 against 4 per 1000 in advanced countries like Japan, France, Germany, Russia and USA in 2010 [8] [12] [13] (Figure 2). This difference would be accounted for in one way by the socio-economic progress, the development of sanitary infrastructures, the falling of the number of births and the increase of schooling in advanced countries and in another way by the





**Figure 2.** Distribution of PNM in the world from 1991 to 2017.

criteria of the stillbirth definition. The PNM was 93 per 1000 in rural area in Kadiolo against 59 per 1000 in urban area in Bamako and 78 per 1000 in the city of Gao [9] [14]. The rural area is characterized by its low rate of schooling, insufficiency of skillful personnel and finally the low level of technical platform for neonatal and obstetrical emergencies management. The stillbirth component of the perinatal mortality in our study was 69 per thousand and the early neonatal component of the mortality was 24 per thousand. Indeed, in most of the developing countries, there is a major problem of systematic collection of information during pregnancy, delivery and post-partum as well. The poor health coverage made the sanitary structures receive the delivering mothers from remote community, often with difficult access and loss of information about the women as soon as they leave the sanitary structures. In such a context of poor organization of health system where health structures cannot keep the delivered women just for 48 hours, the neonatal component of perinatal mortality is highly underestimated.

#### **4.2. Distribution of Perinatal Mortality on the Basis of the Characteristics of Mothers, Fetuses and Newborns**

The second message was about the women with perinatal deaths. The perinatal deaths were more common in mothers aged 20 to 30 years either 65%. Kanoute, D. *et al.* [14] have obtained (66.5%) for women aged between 20 - 34 years old; (20%) for adolescents and (13.5%) for women aged 35 years old or more respectively. The high frequency of perinatal deaths in mothers who are between 20 - 34 years could be accounted for by a high fecundity for synthetic indicator of fecundity = (SIF) with early, successive pregnancies in rural area characterized by poverty, non-schooling of women and poor quality of maternal and neonatal care. In our study, we have found out 91.7% of household women and 77.1% of non-schooled mothers. These characteristics have a relationship with low so-

cio-economic context. According to Montue S.C. [15] the higher the perinatal death was, the lower is the socio-economic level. Studies on perinatal mortality have confirmed that in many countries, the perinatal mortality was high in the lowest income social groups [15]. In developing countries, the low socio-economic conditions and the low level of education were essential risk factors of PNM [3] [15]. In our study, the perinatal death had concerned particularly multiparous with 54.1% whereas Chalumeau, M. *et al.* reported in 2002 that multiparous factor increased 1.42 times the risk of perinatal mortality [16]. In addition, Traore, S. [10] has pointed out 69.7% of multiparous. Katile, M. [16] has had 64.8% of multiparous. The AL was stained in 97.6% cases in our study versus 61.6% in the study of Katile, M. [16]. The fresh stillbirths represented 41% in our study which shows clearly a lack of follow-up of delivery labor and the management of obstetrical emergencies. Indeed, in our study, 76% of perinatal deaths were gestational age over 34 WA against 61.6% in the work of Katile, M. in Bamako. Merger, R. *et al.* reported that factors of variations of the perinatal mortality were preterm (65%), motherhood age, the type of pregnancy, the parity, the sex of newborn [17].

### 4.3. The Eventual Causes of Perinatal Mortality

The third message was about the eventual causes of perinatal deaths. In **Table 4**, it appeared that the four leading causes of perinatal death in our study were similar to those found by Katile *et al.* in Kati and Camara *et al.* in Sikasso where the following causes represented respectively HBP (38.6%), AFD (34%), neonatal infection (30%), anemia (20%). Indeed, the appropriate monitoring of the pregnancy and labor would permit to reduce the lethality linked to those affections. In our study it was eventual causes determined from the context and risk factors related to pregnancy during the staff meeting. The HBP and its complications represented the first rank and were responsible for 29% of perinatal deaths and followed respectively by AFD (23%), neonatal infection (14%), anemia (10%). The study done by Ravaoarison, L. in Antananarivo in 2014 showed out results more or less close to those of our study. The fetal distress, fetal growth retardation (weight at birth < 2500 g) the neonatal infection and the low indication of Apgar (<7) constituted the primary factors of perinatal deaths [8] [18]. All the causes found out were avoidable on condition to perform a good quality of prenatal monitoring of women, to refer them in time to delivery structures, to proceed a good quality of delivery and a good management of newborn. That has been clearly illustrated by the results of this study. In fact, the most vulnerable newborns to perinatal deaths were those whose mothers lived in rural area. The high risk of rural areas is confirmed by national health statistics showing 93 per 1000 of perinatal deaths % in rural area against 56% in urban area in Mali [4]. The qualification of the delivery agent and the causes of perinatal death were strongly associated with fetal status at birth. These two factors have been confirmed by many studies [12] [16] [17] [18].

#### 4.4. Methodological Aspects

The fourth message was related to the methodological approach. In fact, no study was done on perinatal mortality in the sanitary district of Kadiolo. This survey was cross sectional and prospective and lasted a year. This permitted to collect a representative number of perinatal mortality cases. All the women with their newborns should be received in post-natal consultation in the third and seventh day. The aim was to see the state of health of the mother and the newborn. We have recorded some women lost to follow-up and were excluded from the study. In fact, there is difficulty in finding some mothers after their discharge from a maternity unit. The survey was accepted by all the team of the maternity unit that has fully contributed to the success of this study. Thanks to the good organization, the questionnaire was filling in by sending an SMS announcing the perinatal death to the student in charge of study. In fact, this permitted him to get quickly to the place of delivery to better collect the data. For the completeness of the questionnaire, we have proceeded by the active research of perinatal mortality cases.

#### 4.5. The Limits of This Study

We have carried out an analytical cross-sectional study to describe this phenomenon which is perinatal mortality and to produce some associated factors. By conducting a case-control study, risk factors for perinatal mortality will be well identified. Prevention actions can focus on major factors. The main difficulty was the problem of appointments on the 7th day. This limit could be corrected by the sensitization of the population and the implication of the mayors in the establishment of certificates of death and birth certificates. There could be a recruitment bias linked to the framework of the reference center to be avoided by the active search of cases in the population at ceremonies of baptism, death, at the town hall, at the morgue, from the religious authorities. There is a problem of definition that is real. The definition of mortality perinatal has varied both geographically and temporally. The jurisdictions differ with respect to the lower limit of gestational age or birth weight for stillbirth registration. Therefore, although the tenth revision of the classification The International Disease Commission reported that perinatal mortality includes still births and neonatal deaths that occurred in the first week of life, international differences exist and make interpretations difficult.

### 5. Conclusion

Our study confirms the rates of perinatal mortality in Malian rural areas. The causes and factors related to the mother are various and avoidable. The implementation of a coherent strategy and based on effective cares should permit to fall the rates that are still high. Information of women on the list of danger of pregnancy and delivery should also be strengthened. The follow-up of the prenatal condition, the delivery service and the post-natal consultation should be of

high quality. It would be necessary to conduct a case-control study in order to bring precision about risk factors of perinatal mortality in Kadiolo.

### Public Declaration of Interests

I, the underlined, Dr FANE Seydou, declare not to have any direct or indirect financial interest or in nature with private, industrial and commercial organization in relation to the topic presented.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

### References

- [1] Saizonou, J., Kpozehouen, A., Ouendo, E.M., Many, K.L., Aguemon, B., Makoutode, M., *et al.* (2013) Factors Associated to Stillbirth at the Hospital in the Area of pobè-adja-ouèrè-ketou in Benin. *Epidemiology and Public Health Journal*, **12**, 33-45.
- [2] Diarra, S., Teguede, I., Traore, M., Keita, M.M. and Dolo, A. (2007) Stillbirths at Point G Teaching Hospital from 1985 to 2003. Bamako, 121.
- [3] Hanafi, E.A. (2004) Retrospective Study of Perinatal Mortality at the Level of Maternity Unit of "Essalama" Hospital of El Kelaa des Sraghna: Causes and circumstances. Morocco, 91.
- [4] Ministry of Health, Solidarity and Aged Persons (2012-2013) Demographic and Health Survey (DHS V), Report of Synthesis of Planning and Statistic Unit. 450 p.
- [5] Camara, S.B., Teguede, I. and Dolo, A.I. (2006) Perinatal Mortality in the Sanitary Structures of Sikasso City from February 2005 to January 2006. Bamako, 169.
- [6] Ntambue, A., Malonga, F., Dramaix, W.M. and Donnen, P. (2013) The Perinatal Mortality: Magnitude and Causes in Lubumbashi, Democratic Republic of Congo. *Epidemiology and Public Health Review*, **61**, 519-529.
- [7] Blondel, B. and Breart, G. (2004) Stillbirth and Neonatal Mortality. *EMC-Pediatrics*, **1**, 97-108. <https://doi.org/10.1016/j.emcped.2003.09.002>
- [8] Cisse, C.T., Martin, S.L., Mgoma, S., Mendes, V. and Diadhiou, F. (1996) Early Neonatal Mortality at the Maternity Unit of the Teaching Hospital Center of Dakar: Current Situation and Evolutive Trends from 1987 to 1994. *Med. review. black Afr.*, **43**, 254-208.
- [9] Dougnon, H., Teguede, I., Dolo, A.I., Keita, M.M. and Traoré, M.S. (2006) Perinatal mortality study in Gao city from January to December 2005. Bamako, 184.
- [10] Traore, S. (2005) Stillbirth Study at Commune V Referral Health Center of Bamako. Bamako, 80
- [11] Rakotoseheno, H. and Rakotirinina, E.J. (2008) Antenatal Consultations and Perinatal Mortality in Madagascar. *Journal of Gynecology Obstetrics and Biology of the Reproduction*, **37**, 505-509. <https://doi.org/10.1016/j.jgyn.2008.04.006>
- [12] Merger, R., Levy, J. and Melchier, J. (2001) Obstetric précis. 6th Edition, Masson, Paris.
- [13] Papiernik, E. (1996) Epidemiology of Dead Fetuses before the Labor in the Perinatal Survey of Seine Saint-Denis. *Journal de Gynécologie Obstétrique et Biologie de la*

*Reproduction*, **25**, 153-159.

- [14] Kanoute, K.D., Sow, A.S., Toure, S. and Diabate, A. (2011) Perinatal Mortality at the Health Center of Kati. Bamako, 120.
- [15] Montue, S.C. (1998) Contribution to the Perinatal Mortality Study at Commune II Socio-Sanitary Center of the District of Bamako from April 1st to December 30th 1997. Bamako, 75, 96.
- [16] Chalumeau, M. (2002) Risk Factors Identification of Perinatal Mortality in West Africa Prenatal Consultation or Monitoring of Delivery. *Journal of Gynecology Obstetrics and Biology of the Reproduction*, **33**, 63-68.
- [17] Katile, M. (1999) Risk Factors of Stillbirth in Gynecology-Obstetric Unit of the National Hospital of Point "G" from 1987 to 1996. Bamako, 40, 113.
- [18] Ravaoarisoa, L., Tangtoy, M.A., Rakotonirina, C.J., Raobijaona, H.S. and Rakotomangarev, J.D.M. (2014) Determinants of Early Neonatal Mortality of Befelatanana, Antananarivo. *Journal of Gynecology Obstetrics and Biology of the Reproduction*, **6**, 1-4.