

## Audit of Maternal Deaths in the Context of the Free Obstetrical Care at the Maternity of the Ignace Deen National Hospital of Conakry Chu

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### Abstract

**Objectives:** To describe the evolution of half-yearly maternal mortality ratios, to describe the socio-demographic characteristics of the patients who died in the facility, to analyse the causes and determining factors of maternal deaths that have occurred in the facility, and to implement strategies to reduce this maternal mortality.

**Methodology:** this was a descriptive, cross-sectional and analytical study carried out at the maternity ward of the Ignace Deen National Hospital of the Conakry University Hospital with data collection in two phases, including a retrospective lasting 6 months from July 1 to December 31, 2018, and the other prospective for a period of 18 months from January 1, 2019, to June 30, 2020.

**Result:** During the study period, 224 deaths were recorded out of a total of 8,539 live births, for an intra-hospital maternal mortality ratio of 2,623.25 per 100,000 live births. The profile of women at risk of maternal death was as follows: patients aged 20-31 (56.26%), married (87.6%), low-income (41.96%), multiparous (33, 1%), evacuated from a peripheral maternity hospital (79.91%), multi guest (34.9%). The majority of deaths occurred within the first 24 hours (75%). The majority of deaths were due to direct obstetric causes: postpartum haemorrhage (52.68%), eclampsia (21.88%). Indirect obstetric causes were dominated by anaemia (16.07%). But in some cases, two or even three factors were associated with the occurrence of the same maternal death.

The most frequently encountered obstetric period of death was postpartum (77.68%). The average recovery time was 31.96 minutes. The lack of blood products and the inadequacy of the technical platform were the main associated factors. Also, it appears that all our cases of death were preventable. The causes of the dysfunctions were attributable: to the person by their attitude (delay in specific care); in the hospital for the lack of equipment and blood products and in the consultation. Free obstetric care was not complete in some cases.

**Conclusion:** maternal mortality is a major health problem in our structure. Its reduction requires the mobilization of all actors in society involving good health education; improving the quality of prenatal consultations and emergency obstetric care by consciously taking charge of staff and strengthening the technical platform.

**Keywords:** Audit of Maternal Deaths, Maternal Mortality, Emergency Obstetric Care, Free Health Care, Conakry

## Introduction

Maternal health is a major concern because of the maternal mortality ratio in Guinea (550 maternal deaths per 100,000 live births) –vastly higher than those in developed countries varying between 5 and 30 maternal deaths per 100,000 live births, despite the significant progress made within the framework of the national program to reduce maternal mortality with the introduction of free health care [1,2]. obstetric care (prenatal consultation, vaginal delivery, and caesarean section) since 2007; Guinean women continue to pay a heavy price for complications related to pregnancy and childbirth. Maternal mortality thus remains a real public health problem in our developing countries, while 80% of maternal deaths are preventable according to the WHO [2].

This maternal mortality is particularly high in the reference structures of our country like ours.

One of the strategies considered to fight against these maternal deaths was the establishment of clinical audit sessions of the quality of care in this maternity unit in the form of a presentation - criticism of maternal death files. This is the framework for our study, the aim of which was to assess the impact of the audit of maternal deaths on the quality of obstetric care.

More specifically, it was:

- To describe the evolution of the six-monthly maternal mortality ratios
- To establish the socio-demographic profile of the patient who died during the study period
- To analyse the causes and determining factors of maternal deaths that have occurred
- Propose strategies to reduce this maternal mortality in the structure

## Methodology

### Setting and Type of Study

The gynecology-obstetrics department of the Ignace Deen National Hospital (the only functional referral maternity unit in the city of Conakry) served as a framework for our work. It was a descriptive and cross-sectional study with data collection in two phases, one of which was retrospective lasting 6 months from July 1 to December 31, 2018, and the other prospective lasting 18 months from January 1, 2019, to June 30, 2020.

### Study Population

The patients (pregnant or parturient or women following childbirth) came either directly from their home or from a peripheral maternity hospital which evacuates them to the CHU. Included were all cases of maternal death recorded in the service and those occurring end route.

### Maternal Death Review

All the cases of maternal death were analysed during a service meeting (daily staff). Socio-demographic characteristics, obstetric history, mode of admission, clinical condition at admission, cause of death, and management were analysed. If the time taken between the positive diagnosis of the pathology and the start of the curative treatment is greater than one hour, we considered that there was a delay in the therapeutic management. The data were collected on a collection sheet comprising the parameters described above. The data were entered using Word and Excel software from the 2010 office pack then analysed using Epi info software in version 7.

## Results

### Maternal Mortality Ratio

During the study period, we recorded 224 maternal deaths out of 8,539 live births, i.e. an overall ratio of 2,623.25 per 100,000 live births.

Table I: Half-yearly maternal mortality ratios

Semesters	Number of deaths	Number of deliveries	Number of live births	Maternal mortality ratio	Caesarean section rate
2nd semester 2018	72	1907	1703	4227.83	53.32
1st semester 2019	65	1833	1634	3977.96	53.95
2nd semester 2019	50	2861	2564	1950.07	53.75
1st semester 2020	37	2924	2638	1402.57	48.97
Total	224	9525	8539	2623.25	58.27

## Sociodemographic Characteristics

### Age

The average age was 27.14 years with extremes of 14 and 53 years. Women aged 20-25 and 26-31 were the most represented with 28.13% respectively for each of the brackets.

### Marital status

More than 8 out of 10 women were married (87.6%) compared to 12.4% single.

### Profession

Low-income women were the most affected with respectively 41.96% of women with a liberal profession and 36.61% of housewives against only 8.04% of women with a level of income considered good (employees).

### Obstetric History

#### Gesture

The average gestity was 3.36 with extremes of 1 and 12. Multigestia were the most affected with 34.9% followed by primigestics (33.5%).

## Parity

The average parity was 2.73 with extremes of 0 and 10. The multiparas were the most affected with 33.1%.

## Number of CPNs

Women not followed up (n=25) and those who performed less than 4 ANC had the highest proportion (52.23%). The required average number of ANC according to Guinean legislation (4 ANC per pregnancy) was only reached in the order of 47.77%.

## Mode of Admission

The majority of deceased women (79.91%) were urgently evacuated

to the ward from peripheral maternity hospitals against 20.09% of women who came directly from home.

## Mode of Delivery

The women had given birth by caesarean section in the majority of cases (n=127), i.e. 56.70% against 25% of vaginal delivery (n=56). Also, 18.30% of deaths from complications of the 1st trimester or other pathologies during pregnancy were recorded (n=41).

## Duration of Stay

The majority of deaths occurred within the first 24 hours following their hospitalization, i.e. 75% (n = 168).

## Causes of Death

Table II: Causes of Maternal Deaths

Obstetric Causes	2nd semester 2018	1st semester 2019	2nd semester 2019	1st semester 2020	Total	Percentage
<b>Direct Causes</b>	<b>180 80.36</b>					
- Induced abortion:						2.23
• Haemorrhage	1	1	2	1	5	(5.35)
• Infection	2	0	3	2	7	3.12
- Eclampsia	15	7	10	17	49	21.88
- GEU	0	1	0	0	1	0.45
- HPPI	35	22	37	24	118	52.68
<b>Indirect Causes</b>	<b>44 19.64</b>					
- Anaemia	10	8	12	6	36	16.07
- Endometritis	2	1	2	0	5	2.23
- Neuropalaria	1	0	0	0	1	0.45
- HIV-AIDS	1	1	0	0	2	0.89

## Obstetric Period of Death

Table III: Obstetric period of death

Obstetric Periods	Effective	Percentage
Pregnancy:		
- 1st trimester		
- 2nd quarter	41	18.30
- 3rd quarter		
Labour	9	4.02
Postpartum	174	77.68
Total	224	100

## Support Time

The average time from arrival to start of the pickup was 31.96 minutes with extremes of 20 minutes and 120 minutes. However, treatment was started within the first 30 minutes in almost all cases (85.71%) compared to 6.25% in 1 to 2 hours.

## Discussion

### Ratio of maternal mortality(RMM)

The maternal mortality ratio recorded in our structure (2,623 per 100,000 live births) is very much higher than the national average observed in 2018 which is 550 deaths per 100,000 live births and the ratio of the same service in 2006 which was 980 deaths

per 100,000 live births showing that the evolution of mortality is unfavourable in our structure [1,3]. On the other hand, this ratio is close to that of Bohoussou et al. [4]. during a similar study at the University Hospital of Treichville in Côte d'Ivoire in 2006 reporting a ratio of 2535 per 100,000 live births, 4 times higher than the national average in Côte d'Ivoire at the time (600 deaths per 100,000 live births).

In the rest of Africa, higher maternal mortality ratio values were noted in the south of the Sahara in Mali between 2005 and 2008: 2031 per 100,000 live births and in N'Djamena in 2010 with 968 per 100,000 live births [5,6]. The ratios observed in the Maghreb are 8 to 14 times lower: 56 / 100,000 NV in Algeria in 2006, 92.6 / 100,000 NV in Tunisia between 1998 and 2007 [7,8]. Developed countries record low rates which rarely exceed 10 / 100,000 NV [9].

This high ratio could be explained by:

- Our structure was the only functional reference maternity in the city of Conakry receiving all obstetric complications from the peripheral health structures of the city of Conakry (with two million five hundred thousand inhabitants) and the neighbouring prefectures, hence the concentrations cases of maternal death.
- Since the introduction of free obstetric care, peripheral maternity units equipped with operating theatres (CMCs) are almost non-functional at night on the surgical level and almost exclusively evacuate all cases of obstetric complications requiring surgery.

The analysis of the evolution of maternal mortality during these two years in the service showed a steady decline in the figures. The improvement in these figures is linked to the analysis of the causes and circumstances of death, the situation of liability, and the possibilities of eviction during clinical audit sessions presented in the form of a "case review" of files of deceased patients. This made it possible to identify prevention strategies (recommendation for clinical practice for obstetric emergencies displayed in the delivery room), without also forgetting, among other things: the improvement of working conditions in the structure with the strengthening of the equipment, but also the establishment of free natural childbirth and caesarean section at the country level.

### Sociodemographic Characteristics

The age groups of 20-25 years and 26-31 years were the most represented with an average age of 27.14 years. This average age falls within the range of 24.6 years found by various African authors [10,11]. This age group constitutes the period of great fertility for women in Africa. On the other hand, Bouvier-Colle et al. in France on a sample of 39 cases of maternal death had found an average age of 31.6 years. This difference could be explained by the late average age of onset of the first pregnancy in Europe (33.7 years) [12,13].

Concerning the profession, our result matches that of Thiam et al. in Senegal who had reported in their series that 56% of deceased patients had a low income against 3% of women with an income deemed good [14].

### Obstetric History

Along with age, multiparity is also a substantial factor in the risk of maternal death. It is found in 33.1% of our patients. This rate of multiparas is lower in the series by Thiam et al. in Senegal (44.3%). On the other hand, primiparas were predominant in the series by Foumsou et al. in Chad [14,15]. Multiparity is linked to the way of life: early marriages, numerous and often close pregnancies. But still, the inked concept of multiple procreation for the integration of the woman in the company favors multiparity: The African woman often illiterate and ignorant has a pronatalist conception. Thus, women aged 30 and over, usually multiparous with a low level of income.

In our series, only 47.77% of women who died had equaled or exceeded the required number of 4 ANC. Almost 11% of women had not performed ANC. According to the literature, 11% of maternal deaths can be prevented by ANC [16,17]. Even if it does not make it possible to foresee all the risks, well-done prenatal surveillance makes it possible to identify women with a major history for their referral in time to a referral structure. A recent randomized study suggests, to improve the experience of women concerning prenatal care and monitoring, an increase in the number of antenatal visits to eight (8) contacts, especially in low-resource countries [18]. Because very often.

In our study, 179 patients or 79.91% of deaths were urgently evacuated from peripheral maternity hospitals. This rate is close to those of Ouedraogo et al. in Burkina Fasso and Thiam et al. in Senegal who had found 88.5% and 78% respectively of evacuees among their deceased patients [14,19]. The CHU is the reference center for peripheral health structures, by the organization of the health system. Also, the dysfunction of certain surrounding surgical antennae, the usual unavailability of transfusion, and the operating kit were the frequent reasons for evacuation to the CHU.

According to Bouvier-Colle et al. when one separates the maternal mortality rate of women who arrived by transfer from the mortality of women residing in the area, it follows that the risk of dying for an evacuated or transferred woman is eight to fifteen [19]. times higher than that of a woman residing in the area. This frequency of evacuations is found in most of the African series [20,21]. It then becomes essential to see urgent that the peripheral maternities can be reinforced in qualified personnel but also the inadequate device of basic obstetric and neonatal emergency care, to considerably reduce this high rate of obstetric evacuation.

### Obstetric Period of Death

In our series, 77.68% of patients died postpartum and 75% within 24 hours of admission. These patients being received late in the structure, died of direct obstetric causes thus posing the problem of the management of the parturition in our context. Without also forgetting the lack of blood products, the insufficiency of the technical platform causing a delay in the assumption of responsibility at the CHU, and the poor general state of the women on admission.

### Causes of Death

Women die from the same causes all over the world [11,12,22]. Only the proportions vary from one country to another. In our



study, the direct causes were predominant with 180 cases or 80.36%. Among these direct causes, immediate postpartum haemorrhage occupied a preponderant place in our series (52.68%) as in several of the African series [5,11,14]. Eclampsia occupied the 2nd place of deaths by direct obstetric cause with 21.88%. In Africa and Asia, almost a tenth of maternal deaths is associated with hypertensive disorders during pregnancy [23]. Less unpredictable than haemorrhages, complications of pregnancy-induced hypertension can be prevented by appropriate and close monitoring of patients by qualified health personnel.

The main direct obstetric causes identified, namely haemorrhage, complications of arterial hypertension, complications of induced abortions, and obstructed labour, could be the subject of special attention when monitoring the pregnancy and assisting with childbirth. Our results confirm the importance underlined by several authors [24,25] of cases of complicated abortions in maternal deaths: 12/224 during our study period. The very restrictive legal provisions in matters of voluntary termination of pregnancy in our countries and certain cultural and religious considerations lead many women to perform abortion clandestinely in conditions that expose them to haemorrhagic and septic complications.

With 7.59% of deaths in our study, infections are often the result of poor hygiene during childbirth, in the postpartum, and postpartum. Our rate is higher than that reported by Thiam et al. in Senegal (5%) [14]. Also, there is a significant proportion of indirect causes (16.07%), hence the need for special attention to the delivery of pregnant women with chronic diseases for better planning of pregnancies with a multidisciplinary approach. All of the maternal deaths in our study were preventable. Maternal deaths were caused by pathologies that could have been prevented or whose treatment would have prevented a fatal outcome.

### Dysfunction of the Care

In our series, 14.29% of deceased patients had been treated late after 30 minutes. This observed delay in care has already been underlined by Poual et al. in the MOMA survey carried out in West Africa [25]. We agree with him that this delay could be mainly linked to the passive attitude of the staff (doctors, midwives), the notion of urgency not being well perceived in certain cases.

In terms of emergency caesarean section, the recommendations of the RCOGG (Royal College of Obstetricians and Gynaecologists) set a maximum delay of 30 minutes between the indication and the extraction [26]. Integrated Management of Pregnancy and Childbirth (IMPAC) indicates delays that may vary from 1 to 2 hours for indications for caesarean section during the main obstetric causes of maternal death. The delay in the obstetric evacuation was also found as a contributing factor (79.91% of deceased patients were evacuated).

### Conclusion

Maternal mortality remains a public health problem in our structure. The distribution of causes of maternal death observed in our study confirms what was known for developing countries: haemorrhages are the leading cause, followed by complications of arterial hypertension. Other factors relating to the patient, the communi-

ty, and the health organization are also involved. To avoid these deaths, the following solutions could be beneficial:

- Reorganization of SONUCs at the level of CMCs (municipal medical centers)
- Institutionnalisation of maternal health auditing
- Improvement of the CHU's technical platform
- Better organization of the supply of emergency care
- The dysfunctions found challenge all the actors concerned in the care of women during the pregnancy-puerperium within the service and those of the peripheral health structures

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