Scientific Research Publishing

Open Journal of Obstetrics and Gynecology, 2025, 15(1), 108-117
https://www.scirp.org/journal/ojog
ISSN Online: 2160-8806
ISSN Print: 2160-8792

Epidemiological Aspects of Maternal Deaths Observed on Arrival over a Decade at the Fousseyni Daou Hospital in Kayes

Mahamadou Diassana[1,2*], Ballan Macalou[1,2], Sitapha Dembele[1,2], Robert Diarra[1], Alima Sidibe[3], Lassina Goita[2,4], Samou Diarra[2,5], Seydou Z. Dao[2,6], Mamadou Haidara[2,7], Famakan Kane[2,8], Fantamady Camara[9], Soumaila Traore[2,10]

[1]Department of Gynecology and Obstetrics of the Fousseyni Daou Hospital in Kayes, Kayes, Mali
[2]National Center for Scientific and Technological Research of Bamako, Bamako, Mali
[3]Kayes Reference Health Center, Kayes, Mali
[4]Anesthesia and Intensive Care Department of the Fousseyni Daou Hospital in Kayes, Kayes, Mali
[5]Management of Fousseyni DAOU Hospital, Kayes, Mali
[6]Reference Health Center of the Commune II, Kayes, Mali
[7]Kalabancoro Reference Health Center, Bamako, Mali
[8]Bla Reference Health Center, Bla, Mali
[9]Kayes Regional Health Directorate, Kayes, Mali
[10]Gynecology and Obstetrics Department of Sikasso Hospital, Sikasso, Mali
Email: *mahamadoudiassana@gmail.com

How to cite this paper: Diassana, M., Macalou, B., Dembele, S., Diarra, R., Sidibe, A., Goita, L., Diarra, S., Dao, S.Z., Haidara, M., Kane, F., Camara, F. and Traore, S. (2025) Epidemiological Aspects of Maternal Deaths Observed on Arrival over a Decade at the Fousseyni Daou Hospital in Kayes. *Open Journal of Obstetrics and Gynecology*, **15**, 108-117.
https://doi.org/10.4236/ojog.2025.151011

Received: December 24, 2024
Accepted: January 24, 2025
Published: January 27, 2025

Abstract

Introduction: The objective of this work was to study maternal deaths noted on arrival in the Gynecology and Obstetrics Department at Fousseyni Daou Hospital in Kayes over a period of 10 years. **Materials and Methods**: This was a cross-sectional, descriptive study with data collection over a period of 10 years; The data collection was retrospective over nine years from January 1, 2013 to December 31, 2021 and prospective over one year from January 1, 2022 to December 31, 2022. This study focused on all patients whose death was noted on arrival during pregnancy, labor or in the postpartum period in the Gynecology-Obstetrics Department of Fousseyni Daou Hospital. Confidentiality and anonymity were respected. The processing and analysis of statistical data were carried out using SPSS 20.0 software. **Results:** During the study period, we recorded 93 cases of death noted on arrival out of a total of 606 maternal deaths, *i.e.*, a frequency of 15.34%. The average age was 27 years with the extremes of 20 years and 34 years. They came mainly from rural areas at 74%, were married at 82%, uneducated at 51.6%, housewives at 87.1%. The profession of the spouses is worker at 37.6%. In our sample, evacuated patients were the most represented with 75.3%. Postpartum hemorrhage was the most frequent reason

for admission with 22.6%. The deceased patients had no medical history at 86%. In our series, 59.5% of the deceased patients had not had antenatal consultations (CPN). Patients who died on arrival and who had given birth at home were the most represented with 54.8%. Deaths from immediate postpartum hemorrhage complicated by shock were the most frequent with 25.8% followed by severe anemia 8.6%. Deaths were mainly due to direct obstetric causes at 76.3%. In these deaths observed on arrival, the 2nd delay was identified at 48.4%. **Conclusion:** Maternal deaths observed on arrival remain frequent in the Kayes region. The main causes are immediate postpartum hemorrhage and anemia, which are almost all preventable causes of maternal death following the 1st and 2nd delay.

Keywords

Death Observed on Arrival, Maternal Mortality, Kayes Hospital

1. Introduction

The priority role of women in society since Adam and Eve is procreation. Assuming it correctly sometimes requires heavy sacrifices. Safe motherhood remains the major challenge of any action aimed at improving maternal and child health [1]. According to the WHO [2], half a million women die worldwide during pregnancy, childbirth or in the postpartum period, leaving one million orphans. This rate is very high in developing countries where the rates recorded can reach 15 to 20 times the figure recorded in industrialized countries [3]. According to the work of UNICEF [4] and WHO [5], maternal death is 1/13 in sub-Saharan Africa compared to 1/4100 in industrialized countries. The WHO estimates that each year more than 20 million women suffer from ailments related to unassisted childbirth [6]. Many mothers do not have access to modern health care services. It is estimated that between 60% and 80% of women in developing countries continue to give birth at home without any assistance or with the help of unqualified people and usually in an unsanitary environment. This state of affairs is due to two main causes: ignorance and poverty [7]. Our women are not informed of all the risks they run when giving birth at home. And sometimes even if complications arise (maternal death, fetal death, postpartum or contemporary hemorrhage, serious perineal tear), they put them down to witchcraft [8]. On the other hand, it is poverty that forces some to give birth at home. Since the husband cannot afford to bear the costs of childbirth, the woman finds herself in the sad obligation to give birth at home without assistance because she does not even have the means to pay the costs [9]. Our various leaders have always sought ways to improve the conditions of childbirth for women, in order to reduce as much as possible the rates of maternal and neonatal deaths during childbirth. While it is essential to provide quality services, it is equally important to increase their use. What good is a district hospital with the best equipment if women cannot afford to use it? In the Kayes region, quite a few births take place at home; of course, many others give birth in health facilities. In addition, the place of

delivery varies significantly according to socio-demographic characteristics, and the level of education and prenatal monitoring play a major role in the choice of place of delivery [10]. All these facts contribute to the increase in maternal and perinatal mortality. Concerted action is required if we want safety to become a reality for the millions of women around the world who give birth in the absence of essential services. This is the place to praise and encourage the Malian government in its efforts to promote the schooling of children in general and girls in particular and for the development and implementation of the national strategy to combat poverty. Let us hope that all these actions will help us to reduce as much as possible the rate of unassisted home births in our country. Given the significant frequency of deaths observed on arrival Kayes for various reasons through the hospital statistics of the service and the records of these deaths that we have archived for a decade; it seemed important to us to initiate this work.

2. Methodology

The region of Kayes is located in western Mali. It covers an area of 120,760 km^2 and has 2, 338,999 inhabitants. The Fousseyni DAOU hospital in Kayes is a 2nd reference public hospital establishment with a capacity of 160 beds.

This was a cross-sectional, descriptive study with data collection over a period of 10 years; Retrospective collection over nine years from January 1, 2013 to December 31, 2021 and prospective over one year from January 1, 2022 to December 31, 2022. Covering all patients whose death was noted on arrival during pregnancy, labor or in the postpartum period in the gynecology-obstetrics department of Fousseyni Daou Hospital. The sampling was exhaustive, taking into account all patients whose death was noted on arrival. Included in this work were: all patients whose death was noted on arrival during pregnancy, labor or in the postpartum period. Excluded from the study were: all patients who died after 42 days postpartum or post-abortion; all patients who died in the department during hospitalization. Data collection was done on a survey form, obstetric records, the admission register, and the death register. Data entry was carried out on Microsoft Office World 2010 software. Statistical data processing and analysis were carried out using SPSS 20.0 software. The ethics committee of the Fousseyni DAOU hospital in Kayes has given its approval for this work to be carried out. Confidentiality and anonymity were respected**.** Operational definitions of the 3 delays: 1st delay, is the delay related to the patient, her family or her community in seeking health care. 2nd delay, is the delay related to the, patient's transport (all difficulties due to means of transport and the state of the roads) 3rd delay, is the delay related to care in health establishments and the quality of care.

3. Results

During the study period, we recorded 93 cases of deaths noted on arrival out of a total of 606 maternal deaths, *i.e.* a frequency of 15.34%. The years 2014 and 2021 recorded a large number of deaths observed on arrival, 13 cases each for these 2

years (Figure 1). The average age was 27 years with extremes of 20 and 34 years. They mainly came from rural areas at 74%. Many mothers do not have access to modern health services due to ignorance and insufficient financial resources as shown by the percentage of deceased without education 76.35%; they were housewives at 89.26% (Table 1); similarly the wives of the deceased were workers at 37.6% (Table 2). In our sample, evacuated patients were the most represented with 75.3%. Postpartum hemorrhage was the most frequent reason for admission with 22.6% (Table 3 and Table 4). The deceased patients had no medical history at 86%. Deaths from immediate postpartum hemorrhage complicated by shock were the most frequent with 25.8% followed by severe anemia 8.6% (Table 5). Deaths were mainly due to direct obstetric causes at 76.3% (Table 6) (Figure 1).

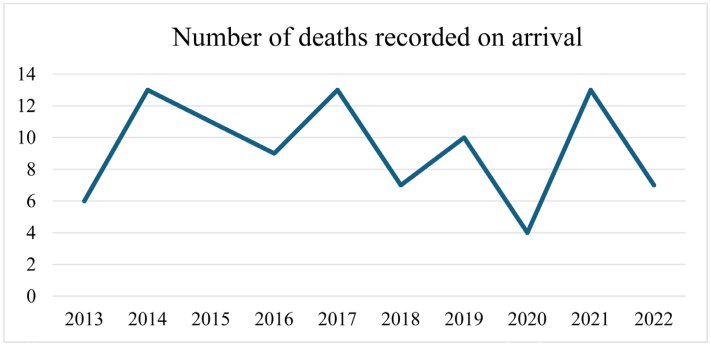

Figure 1. Evolution of the number of maternal deaths observed on arrival per year.

Table 1. Socio-demographic characteristics of deceased patients recorded on arrival.

	Number (n=93)	%
Age groups (years)		
≤19	13	13.99
20 and 34	58	62.36
≥35	22	23.65
Occupation		
Housewives	83	89.26
Housekeeper	3	03.22
Student	7	07.52
Official	0	0
Marital status		
Bride	82	89.18
Bachelor	7	07.52
Widow	2	02.15
Divorcee	2	02.15

Continued

Education level of patients		
Out of school	71	76.35
Primary Level	14	15.05
Secondary Level	8	08.60
Higher Level	0	0

Average age of patients 27 years Extremes 20 years and 34 years.

Table 2. Distribution of deceased patients according to the profession of their spouses.

Spouse's profession	Number	%
Farmer	21	22.6
Breeder	9	9.7
Seller	18	19.4
Artist	4	4.3
Civil Servant	1	1.1
Driver	5	5.4
Worker	35	37.6
Total	**93**	**100**

In this study, the majority of deceased women lived in rural areas (74%) and 26% in urban areas. Almost all deceased patients were evacuated (97.8%). Eighty-six percent of deceased women had no medical history; 7.5% were known to be hypertensive; 2.2% had a history of cesarean section surgery.

Table 3. Distribution of deceased patients according to evacuation structures.

Evacuation structures	Number	%
Reference health center	11	11.8
Community health centers	50	53.8
Private clinic	1	1.1
Private hospital	9	9.7
Referred by parents	2	2.2
Medical office	20	21.5
Total	**93**	**100**

In our series, 49.5% of deceased patients had not had prenatal consultations (CPN); 47.3% had had 1 to 3 CPN and 3.2% 4 or more CPN. The deceased patients

noted on arrival who had given birth at home were the most represented with 54.8%.

Table 4. Distribution of deceased patients according to reason for evacuation.

Reason for evacuation	Number	%
Bleeding during pregnancy	15	16.1
Loss of consciousness	20	21.5
Muscle weakness	1	1.1
Eclampsia	12	12.9
Postpartum hemorrhage	**21**	**22.6**
HRP	1	1.1
Severe anemia	8	8.6
Abdominal pain	3	3.2
Chest pain and cough	2	2.2
Mechanical dystocia	4	4.3
Others	6	6.3
Total	**93**	**100**

Table 5. Distribution of patients according to causes of death.

Causes of death	Number	%
Acute pulmonary edema	3	3.2
Retroplacental hematoma	9	9.7
Eclampsia	20	21.5
HIV/AIDS	1	1.1
Severe malaria	9	9.7
IPH complicated by shock	24	25.8
Uterine rupture	3	3.2
Ionic disorder	8	8.6
Severe anemia in the postpartum period	8	8.6
Abortion (I.V.G complicated by hemorrhagic shock)	1	1.1
Severe pregnancy vomiting	1	1.1
Unknown causes	6	6.5
Total	**93**	**100**

Immediate postpartum hemorrhage complicated by shock and eclampsia were the main causes of death with 25.8% and 21.5% respectively.

Table 6. Distribution of patients according to direct or indirect obstetric causes of death.

Obstetric causes of death	Number	%
Direct obstetric causes	**N = 71**	**76.3**
Eclampsia	20	28.16
Retroplacental hematoma	9	12.67
Postpartum hemorrhage	33	46.47
Abortion	1	1.40
Uterine rupture	8	11.26
Indirect obstetric causes	**N = 22**	**23.7**
Anemia	9	40.90
Ionic disorders	1	4.54
Severe malaria	1	4.54
Acute pulmonary edema	3	13.63
HIV in pregnancy	1	4.54
Severe vomiting during pregnancy	1	4.54
Unknown causes	6	27.27

Direct obstetric causes accounted for 76.3% and indirect causes for 23.7%.

Deaths were mainly due to direct obstetric causes at 76.3%. Anemia with 40.90% was the main cause of indirect obstetric death. In these deaths observed on arrival the 1st delay was identified at 48.4% followed by the 2nd 39% and 3rd delay 12.6%.

4. Discussion

We conducted a cross-sectional, descriptive study with retrospective and prospective data collection; including all maternal deaths observed on arrival recorded at the Fousseyni Daou hospital in Kayes over a decade.

Like many studies with retrospective data collection, we encountered certain difficulties, in particular the lack of information on certain death records observed on arrival, the unavailability of a qualified laboratory for the autopsy of cases of death observed on arrival (DCA). Over a period of 10 years (2013-2022), we collected 606 maternal deaths. Among which 93 cases are deaths observed on arrival, *i.e.* a frequency of 15.34%. Our frequency is higher than that reported by Keita Fantamady [11] at the Csréf of Ouelessebougou who reported 0.31% of maternal deaths. This rate could be explained by the distance between the reference health

centers and the poor condition of the roads in the Kayes region for referrals/evacuations and also by an insufficient number of qualified personnel in maternal health services.

The age group of 20 to 34 years was the most represented with 38.7% with an average of 27 years. In Burkina Faso [12], the most affected age group was 21 to 30 years or 38%. In Congo Brazzaville [13], the most represented age group was 20 to 34 years or 59.1%. In France [14], the most represented age group was 20 to 34 years with 59.1%. The majority of deceased patients were married in 82% of cases. Many mothers do not have access to modern health services due to ignorance and insufficient financial resources as shown by the percentage of deceased without education 76.35%; they were housewives at 89.26% (**Table 1**); similarly the wives of the deceased were workers at 37.6% (**Table 2**). illiteracy has a negative influence on maternal mortality rates [15]. This is explained by the fact that the majority of our patients came from rural areas (74%). In our series, 49.5% of the deceased patients had not undergone prenatal care (CPN). Prenatal care is the preferred period when high-risk pregnancies are detected for treatment [16], [17]. Our result is higher than that of Sissoko A. [18] who found that 31.8% of the deceased women had not undergone CPN. In this work, 75.3% of the patients were evacuees. Our frequency is lower than that of Akpadza in Congo [19] who found 20.5% of the patients who died following evacuation to the Tokoin University Hospital. Eighty-six percent of patients had no medical history. This frequency is lower than that of Fassirima. F. Keita [20] who found 94.3%. Immediate postpartum hemorrhage (IPH) was the most represented probable cause with 25.8%. Akpadza K. and A. [19] in Congo found 8.5% of deaths by IPH at the Tokoin University Hospital. Fernandez H. et Coll. stated that a woman presenting an antepartum hemorrhage has an estimated survival of 12 hours before treatment while a woman presenting a postpartum hemorrhage has only 2 hours [21]. The postpartum period is a critical period. Among patients who died on arrival, those for direct obstetric causes were the most represented at 76.3%. Anemia during pregnancy was the most represented death by indirect obstetric causes with 40.90%. This rate is lower than that of Sékou SISSOKO [22] who found 63.4% of anemia in the Csréf of the Bamako district and lower than that of Akpadza [19] in Congo who found 16.2%. These deaths observed on arrival in our context could be explained by socio-economic and cultural factors, namely the lack of financial resources for care, the respect of traditional habits leading to a delay in consultation, the lack of knowledge of the diagnosis by health personnel leading to a delay in evacuation. Because our deceased the 1st delay was identified at 48.4% followed by the 2nd 39% and 3rd delay 12.6%.

5. Conclusion

Maternal deaths observed on arrival remain frequent in the Kayes region. The main causes are immediate postpartum hemorrhage and anemia, which are almost all preventable causes of maternal death following the first and second delays.

Recommendations for Health Authorities and Health Personnel

- Implement a rigorous awareness-raising policy among the population by qualified personnel, the media, and local elected officials for better adherence to care in health structures;

- Conduct regular training sessions on basic and complete emergency obstetric care in order to reduce the mortality rate;

- Perpetuate regular audit sessions and the application of these recommendations.

Conflicts of Interest

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

References

[1] WHO (1996) Safe Motherhood.

[2] World Health Organization (WHO) (2014) Global Causes of Maternal Death. A WHO Systems Analysis.

[3] Faucher, P., Dappe, S. and Madelenat, P. (2002) Maternity in Adolescence: Obstetrical Analysis and Review of the Influence of Cultural, Socioeconomic and Psychological Factors in a Retrospective Study of 62 Cases. *Gynécologie Obstétrique & Fertilité*, **30**, 944-952. https://doi.org/10.1016/S1297-9589(02)00497-6

[4] World Health Organization (WHO) (1996) Revised 1990 Estimates of Maternal Mortality: New WHO/UNICEF Methodology. Vol. 6. World Health Organization, 14.

[5] World Health Organization (WHO) (1999) Joint WHO/UNFPA/UNICEF/World Bank Statement. Reducing Maternal Mortality. 618-622.

[6] World Health Organization (WHO) (1998) World Health • Slst Year, No. 1, January-February 1998.

[7] Labama, L. (1995) Home Birth, a Risk for the Mother and Child. *Medical Panorama*, **12**, 720-723.

[8] Conable, B. (1987) Safe Motherhood. *Medical Forum on Health*, **8**, 164-170.

[9] Trimo, H.R. (1991) The Integration of Maternal and Child Health Services into Primary Health Care. WHO.

[10] Nouhoum, D. (2001) Study of Home Births in the Bamako District CV about 728 Cases. Ph.D Thesis, University of Bamako, Mali.

[11] Keita, F. (2018) Epidemiology of Maternal Mortality at the Ouelessebougou Reference Health Center. Ph.D Thesis, University of Bamako, Mali.

[12] Some, D.A., Coulibaly, M., Bamba, M., Sosseu, A., Tamini, T.C., Sanou, A., Dembele, S., Wattara, M., Bambara, B. and Taiera Bonane, B. (2020) Intra-Hospital Maternal Mortality at the Sourô Sanou University Hospital in Bobo Dioulasso, Burkina Faso. *SAGO Journal*, **21**, 29.

[13] Yambare, A. and Gabin, I. (2017) Analysis of the Determinants of Prepartum Maternal Mortality in the Republic of Congo (2013-2015). https://hal.science/hal-01593267v1

[14] Deneux-Tharaux, C. (2017) Maternal Mortality in France Main Results of the Report. https://www.sfmp.net/wp-content/uploads/2017/10/2-Deneux-tharaux-Mort-Mat.pdf

[15] Bouissou, R. (1967) History of Medicine.

[16] Du becq, *et al*. (2008) Obstetrical Anesthesia. https://bibliosante.ml/bitstream/handle/123456789/8562/08M464.pdf?sequence=1

[17] Diallo, A., *et al*. (2000) Practice of Epidural Anesthesia in Mali about 1780 Cases. *Medicine of Black Africa*, No. 47, 12.

[18] Sissoko, A. (2020) Study of Maternal Mortality in the District of Bamako/Mali. Ph.D Thesis, University of Bamako, Mali.

[19] Akpadza, K., Kotor, K.T., Baeta, S., Adama, A. And Hodonou, A.K. (1994) Maternal Mortality at TOKOIN University Hospital, Lomé from 1990 to 1992. *Revue française de gynécologie et d' obstétrique*, **89**, 81-85.

[20] Diassana, M., Dembele, S., Macalou, B., Sibibe, A., Keita, F., Haidara, M., Kane, F., Sylla, C., Bocoum, A., Amara, S. and Traoré, S. (2023) Maternal Deaths in Patients Evacuated to the Fousseyni Daou Hospital in Kayes over a Decade. *Open Journal of Obstetrics and Gynecology*, **13**, 1389-1398.

[21] Fernandez, H., Djanhan, Y. and Papierricke, E. (1988) Maternal Mortality Caused by Hemorrhage in Developing Countries. What Policy Is Proposed? *Journal de Gynécologie, Obstétrique et Biologie de la Reproduction*, **17**, 687-692.

[22] Sissoko, S. (2021) Epidemiological Study of Maternal Mortality in the Reference Health Centers of the Bamako District. FMOS, 46.