



Determinants of Maternal Deaths among Women with Obstetric Complications in Kasai Province from 2022 to 2024

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Abstract

Introduction: Maternal mortality remains a major public health problem worldwide. According to recent estimates from the World Health Organization, approximately 287,000 maternal deaths were recorded globally in 2020, with more than 95% occurring in low- and middle-income countries. In the Democratic Republic of Congo (DRC), the maternal mortality ratio remains high, estimated at 760 deaths per 100,000 live births. The objective of our study was to identify the factors explaining maternal deaths among women who experienced obstetric complications in the Kasai Province. **Methods:** This was a mixed-methods study, combining quantitative and qualitative approaches. A case-control analytical design was complemented by a phenomenological design. The study was conducted in the Kasai Province from 2022 to 2024 and included 708 records of women who experienced obstetric complications. **Results:** Among women who experienced obstetric complications, 25% died, reflecting a high obstetric mortality rate. Reports from the Provincial Health Directorate (DPS) indicate a maternal mortality rate of 119 deaths per 100,000 live births. The main factors associated with maternal deaths were maternal age over 40 years, lack of skilled birth attendants, lack of follow-up antenatal care, interpregnancy interval of less than 2 years, and delayed access to care ($p < 0.05$). Postpartum hemorrhage was the direct obstetric cause, while gestational malaria was the indirect cause ($p < 0.05$). Responsibility for

maternal deaths was shared among the community, healthcare facility administration, and healthcare providers. **Conclusion:** Maternal mortality remains high in the DRC, particularly in Kasai Province. The observed maternal deaths are linked to largely preventable factors and involve multiple responsibilities. An integrated approach, taking into account community, institutional, and professional dimensions, is essential for a sustainable reduction in maternal mortality.

Subject Areas

Global Health

Keywords

Maternal Deaths, Explanatory Factors, Kasai Province, DRC

1. Introduction

A maternal death is defined as the death of a woman occurring during pregnancy or within 42 days of its termination, regardless of the duration or location of the pregnancy, resulting from a cause related to or aggravated by the pregnancy, excluding accidental or incidental causes [1].

Globally, maternal mortality remains a major public health challenge. In 2020, approximately 287,000 women died from maternal causes [2]. Hemorrhage remains the predominant direct cause [2].

In sub-Saharan Africa, maternal mortality remains particularly alarming [3]-[5]. Several major explanatory factors have been identified, including limited access to quality obstetric care and insufficient prenatal monitoring; low coverage of prenatal consultations and the persistence of risky practices; unassisted childbirth by qualified personnel; and demographic and geographic variables, such as region or extreme maternal age [6]-[8]. In the Democratic Republic of Congo, the maternal mortality ratio is estimated at 760 deaths per 100,000 live births [9]. The surveillance system reveals significant regional disparities. Some provinces have critical ratios exceeding 300 deaths per 100,000 live births [10]. Hemorrhages, cardiovascular diseases, and structural weaknesses in the health system are cited as contributing factors [11].

Despite the severity of the overall situation, published scientific data on the factors contributing to maternal deaths remain scarce in Kasai Province. Yet, identifying these local factors is essential for guiding prevention interventions, improving the quality of obstetric care, and strengthening strategies to reduce maternal mortality.

The present study aimed to identify the factors explaining maternal deaths among women who experienced obstetric complications in the Kasai Province, in order to provide evidence that could support the decision-making of health authorities and contribute to the sustainable reduction of maternal mortality.

2. Methods

2.1. Study Design

This was a mixed-methods study with a comprehensive design. The quantitative component consisted of a case-control study that established links between maternal deaths and underlying factors. We matched one case with three controls (1:3). The qualitative component, of a phenomenological nature, complemented the quantitative component. This research took place in the 18 health zones of Kasai Province and covered a three-year period, from January 1, 2022, to December 31, 2024.

2.2. Study Framework

The study took place in Kasai Province.

2.3. Study Population

The study population included women who died from a cause related to (or aggravated by) pregnancy and those who experienced obstetric complications in Kasai Province.

2.4. Sampling and Selection Criteria

Regarding the sampling method, the quantitative component adopted an exhaustive approach by including all maternal deaths recorded in documentary sources (maternity registers, partograms, ANC and death review forms) from the 18 health zones of the Kasai Provincial Health Division. Therefore, no sampling was carried out. However, 708 death and complication records were retained. For the qualitative component, purposive sampling was applied to select participants in order to capture the diversity of their perspectives. The data were obtained from primary stakeholders (community members, community relays, and leaders) and secondary stakeholders (healthcare providers and health zone management teams), from 10 focus groups of 8 to 10 participants. Inclusion criteria were the records of pregnant women, women who had given birth, or women who had had abortions, women with obstetric complications, and/or women who died between January 2022 and December 2024 in Kasai for the quantitative component, and healthcare providers and community members who agreed to participate voluntarily in the study for the qualitative component. Exclusion criteria were incomplete or unusable records, or records lacking the information necessary for analysis for the quantitative component, and individuals who had not formally given their informed consent or who chose to withdraw.

2.5. Study Variables

The dependent variable was maternal death, and the independent variables were place of residence, age, marital status, education level, parity, interpregnancy interval, prematurity, attendance at antenatal care, the three delays (delay in deciding to seek care, delay in accessing care, and delay in receiving appropriate care),

obstetric hemorrhage, maternal infections, dystocia, eclampsia, and abortion.

2.6. Data Collection and Statistical Analysis

Quantitatively, data were collected directly in healthcare settings through a review of patient records. A pretest of the questionnaire was conducted. Qualitatively, data were collected through semi-structured interviews (individual and focus groups), conducted until saturation was reached.

Regarding the quantitative component, the data were processed using Epi Info (v7.2.6.0). Measures of frequency, incidence, central tendency (means), dispersion (variance, standard deviation), contingency tables, 95% confidence intervals, odds ratios, and chi-square tests formed the basis of the analysis. For the qualitative component, the verbatim transcripts underwent open coding. The codes were then grouped into categories, sub-themes, and main themes focused on the perceived causes of maternal deaths and potential courses of action to reduce them.

2.7. Ethical Considerations

The protocol was approved by the Ethics Committee of the Faculty of Medicine at the University of Lubumbashi (No. UNILU/CEM/036/2025). Informed consent of the participants, anonymity, and fairness were ensured.

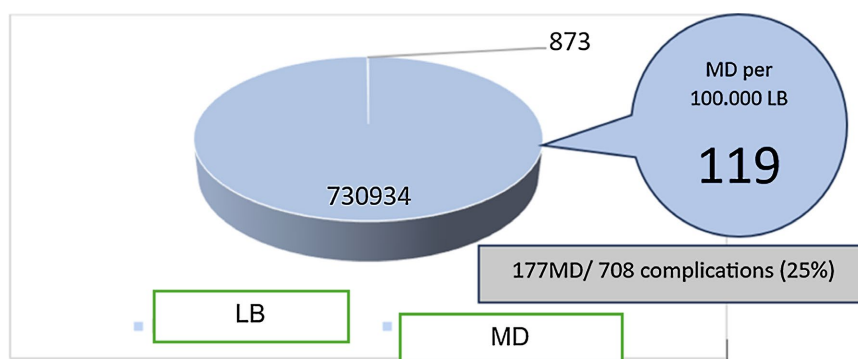
3. Results

Table 1. Sociodemographic characteristics of the women interviewed in Kasai Province from 2022 to 2024.

Parameters		Frequency (N)	Percentage (%)
Mother's age	<18 Years	26	3.67%
	18 à 40 years	648	91.53%
	>40 Years	34	4.80%
	Means $\pm$ SD	29.40 $\pm$ (6.80)	
Origine	Rural	507	71.61%
	Urban	201	28.39%
Educational level	Primary	480	67.80%
	Secondary	216	30.51%
	University	12	1.69%
Number of children	Primiparous	424	59.89%
	Pauciparous	132	18.64%
	Multiparous	152	21.47%
matrimonial Statut	Single	39	5.51%
	Maried	669	94.49%

A total of 708 women who experienced obstetric complications were included in the study. The majority were between 18 and 40 years old (91.53%), with a mean age of 29.4 ± 6.8 years. Nearly three-quarters of them lived in rural areas (71.61%). Primary education was the most common level (67.80%), followed by secondary education (30.51%) and, to a very small extent, university education (1.69%). More than half of the women were primiparous (59.89%), while 21.47% were multiparous (See **Table 1**).

Data from the period 2022-2024 reveal two distinct realities depending on the data collection source. The overall data for Kasai Province (DHIS2) indicates 873 maternal deaths and 730,934 live births recorded, representing a maternal mortality ratio of 119 per 100,000 live births (See **Figure 1**). Meanwhile, data from the targeted survey (Healthcare Facilities & Community) reveal a high mortality rate in emergency situations: 177 maternal deaths out of 708 recorded obstetric complications, representing a mortality rate of 25% (*i.e.*, 1 death for every 4 complications).



MD : Maternal deaths

LB : Live births

Figure 1. Frequency of maternal deaths in Kasai Province from 2022 to 2024. Source: (DHIS2) and our surveys.

All three levels of delay significantly increased the maternal mortality rate compared to the “close call” status ($p < 0.05$). Women who did not receive skilled personnel during delivery had more than twice the mortality rate (OR = 2.25; 95% CI: 1.56 - 3.25; $p < 0.0001$). Failure to attend prenatal care increased the mortality rate by 1.81 times (95% CI: 1.22 - 2.70; $p = 0.0031$). A delay of less than two years between pregnancies doubled the mortality rate (OR = 2.10; 95% CI: 1.48 - 2.97; $p < 0.0001$). Mothers over 40 years of age had more than twice the mortality rate compared to the 18 - 40 age group (OR = 2.21; 95% CI: 1.09 - 4.47; $p = 0.0246$). (See **Table 2**)

Place of origin, marital status, and gestational age did not show a statistically significant association with maternal mortality in this sample ($p > 0.05$).

Obstetric hemorrhage emerged as the leading direct cause of death in this study. Its prevalence was significantly higher among women who died (76.84%) than

Table 2. Determinants of maternal deaths among women interviewed in Kasai Province from 2022 to 2024.

Parameters	Deceased n (%)	Near missed n (%)	OR (CI 95%)	p
First delay				0.0017
Yes	139 (78.53%)	350 (71.57%)	1.89 (1.267 - 2.83)	
No	38 (21.47%)	181 (34.09%)	1	
Second delayed				0.0011
Yes	138 (77.97%)	344 (64.78%)	1.92 (1.29 - 2.86)	
No	39 (22.03%)	187 (35.22%)	1	
Third delay				0.0076
Yes	170 (96.05%)	475 (89.45%)	2.86 (1.28 - 6.40)	
No	7 (3.95%)	56 (10.55%)	1	
Mother's age				
<18 years	7 (3.95%)	19 (3.58%)	1.16 (0.48 - 2.82)	0.7393
18 à 40 years	156 (88.14%)	492 (92.66%)	1	
>40 years	14 (7.91%)	20 (3.77%)	2.21 (1.09 - 4.47)	0.0246
Age of pregnancy				
<33 Semaines	35 (19.77%)	73 (13.75%)	1.64 (0.94 - 2.85)	0.0812
33 à 36 Semaines	108 (61.02%)	342 (64.41%)	1.08 (0.69 - 1.67)	0.7393
>36 Semaines	34 (19.21%)	116 (21.85%)	1	
Skilled childbirth assistance				0.0000
No	126 (71.19%)	278 (52.35%)	2.25 (1.56 - 3.25)	
Yes	51 (28.81%)	253 (47.65%)	1	
Prenatal consultation followed				0.0031
No	138 (77.97%)	351 (66.10%)	1.81 (1.22 - 2.70)	
Yes	39 (22.03%)	180 (33.90%)	1	
Inter-genetic space				0.0000
<2 years	86 (48.59%)	165 (31.07%)	2.10 (1.48 - 2.97)	
≥2 years	91 (51.41%)	366 (68.93%)	1	
Place of origin				0.4133
Rural	131 (74.01%)	376 (70.81%)	1.17 (0.80 - 1.72)	
Urbain	46 (25.99%)	155 (29.19%)	1	
Study level				
Primary	127 (26.46%)	353 (73.54%)	1.80 (0.39 - 8.32)	0.4462
Secondary	48 (22.22%)	168 (77.78%)	1.43 (0.30 - 6.74)	0.6508

Continued

University	2 (16.67%)	10 (83.33%)	1	
Parity				
Multiparous	115 (64.97%)	309 (58.19%)	1.62 (0.10 - 2.63)	0.0488
Pauciparous	25 (14.12%)	107 (20.15%)	1	
Primiparous	37 (20.90%)	115 (21.66%)	1.40 (0.79 - 2.48)	0.2443
Matrimonial Status				0.2163
Single	13 (7.34%)	26 (4.90%)	1.54 (0.77 - 3.07)	
Maried	164 (92.66%)	505 (95.10%)	1	

among those who survived (35.03%), demonstrating a statistically significant association ($p < 0.05$). Other recorded obstetric complications were less frequent, including eclampsia, dystocia, and maternal infections. Furthermore, none of these showed a statistically significant link with maternal deaths in this sample. (See **Table 3**)

Table 3. Direct causes of maternal deaths among women interviewed in Kasai Province from 2022 to 2024.

Parameters	Deceased n (%)	Near missed n (%)	OR (CI 95%)	p
Abortion				0.8175
Yes	6 (3.39%)	20 (3.77%)	0.90 (0.35 - 2.27)	
No	171 (96.61%)	511 (96.23%)	1	
Dystocia				0.3855
Yes	18 (10.17%)	67 (12.62%)	0.78 (0.45 - 1.36)	
No	159 (89.83%)	464 (87.38%)	1	
Eclampsia				0.5559
Yes	2 (1.13%)	5 (0.94%)	1.20 (0.23 - 6.25)	
No	175 (98.87%)	526 (99.06%)	1	
Obstetric hemorrhages				0.0000
Yes	136 (76.84%)	186 (35.03%)	6.15 (4.16 - 9.11)	
No	41 (23.16%)	345 (64.97%)	1	

Indirect causes of maternal death revealed significant differences between the group of women who died and the group of survivors, particularly for malaria and anemia. Malaria was the most frequent condition, significantly affecting more women who died (93.79%) than those who survived (79.66%) ($p < 0.05$). Conversely, anemia of pregnancy was observed in 3.95% of women who died compared to 10.55% of those who survived, also showing a statistically significant dif-

ference ($p < 0.05$). All other conditions (asthma, heart disease, pneumonia, tuberculosis, HIV/AIDS) remained rare and showed no statistically significant association with maternal death (See **Table 4**).

Table 4. Indirect causes of maternal deaths among women surveyed in Kasai Province from 2022 to 2024.

Parameters	Deceased n (%)	Near missed (%)	OR (CI 95%)	p
Anemia				0.0076
yes	7 (3.95%)	56 (10.55%)	2.86 (1.28 - 6.40)	
No	170 (96.05%)	475 (89.45%)	1	
Heart disease				0.0779
yes	1 (0.56%)	14 (2.64%)	0.21 (0.03 - 1.61)	
No	176 (99.44%)	517 (97.36%)	1	
Maternal infections				0.8396
yes	20 (11.30%)	63 (11.86%)	0.95 (0.55 - 1.62)	
No	157 (88.70%)	468 (88.14%)	1	
Malaria				0.0000
yes	166 (93.79%)	423 (79.66%)	3.85 (2.02 - 7.35)	
No	11 (6.21%)	108 (20.34%)	1	

After adjustment, the multivariate analysis shows four main factors independently and significantly associated with maternal mortality: The absence of skilled assistance at delivery multiplies the odds of death by more than two (AOR = 2.3558; 95% CI [1.55 - 3.57]; $p = 0.0001$). An interpregnancy interval of less than two years triples the odds of maternal death (aOR = 3.3039; 95% CI [1.99 - 5.48]; $p = 0.0000$), obstetric hemorrhage nearly sevenfold (aOR = 6.7209; 95% CI [4.25 - 10.62]; $p = 0.0000$), and multiparity nearly halves the odds of maternal death due to a professional care deficit (aOR = 0.6590; 95% CI [0.49 - 0.89]; $p = 0.0071$). The other variables studied did not show a significant association with maternal mortality after adjustment. (See **Table 5**)

Perceptions of Levels of Responsibility for Maternal Deaths

The interview data reveal that responsibility for maternal deaths is perceived as shared and multidimensional. It simultaneously implicates the community, the hospital administration, and healthcare providers.

This distribution highlights the systemic nature of maternal mortality, fitting directly into the analytical model of the three delays (delay in decision-making, delay in access, and delay in care).

Within the community, the main factors identified concern the delayed recourse to care and the refusal of certain critical interventions. Many women only

Table 5. Adjustment for confounding variables.

	AOR	95%	C.I.	Coefficient	S.E.	Z-statistic	p-value
Maternal age	0.7026	0.3602	1.3701	−0.3530	0.3408	−1.0359	0.3002
Anemia	0.5660	0.2268	1.4125	−0.5691	0.4666	−1.2198	0.2226
Non-assistance during labor	2.3558	1.5547	3.5698	0.8569	0.2121	4.0408	0.0001
Antenatal care follow-up	0.0000	0.0000	>1.0E12	−26.8648	1044.9652	−0.0257	0.9795
Interpregnancy interval	3.3039	1.9894	5.4836	1.1948	0.2587	4.6192	0.0000
Obstetric hemorrhage	6.7209	4.2537	10.6192	1.9052	0.2334	8.1633	0.0000
Malaria	1.9418	0.9272	4.0669	0.6636	0.3772	1.7595	0.0785
Parity	0.6590	0.4863	0.8929	−0.4171	0.1550	−2.6909	0.0071
CONSTANT	*	*	*	−0.0287	0.6267	−0.0458	0.9635

attend prenatal appointments in the third trimester or once complications have developed, which limits preventive interventions. The weight of sociocultural norms, women's lack of financial autonomy, and families' inability to cover the costs of care (medications, blood transfusions) hinder decision-making and constitute financial and cultural barriers. The interviews revealed medical reluctance, including initial refusals of emergency procedures such as blood transfusions or cesarean sections. Participants reported the positive impact of family planning and a corresponding decrease in deaths in health areas where adherence to FP and follow-up to ANC are progressing.

“Many maternal deaths are due to women's negligence; they don't attend prenatal care. They only come in during the third trimester.”

“Other families are impoverished; they can't afford the prescribed medications, especially blood for transfusions, because the blood bank is empty and donors are struggling to find the money...”

“Since women started using family planning methods and limiting their pregnancies, deaths have decreased in our health district.”

Institutional and organizational failures within health facilities constitute a major obstacle to patient safety. These failures consist of critical stock shortages (facilities suffer from a recurring lack of essential medicines, blood transfusion supplies, and obstetric emergency kits), infrastructure and training problems (the lack of maintenance of medical equipment is accompanied by a lack of practical training on the use of resuscitation kits), the perverse effects of poorly funded free healthcare (the implementation of free healthcare without adequate financial compensation or salary increases demotivates staff, encouraging negligent behavior), and geographical isolation (the distance from functional health centers, particularly in rural areas, worsens transport times during emergencies).

“The woman has been here for a long time, but there's no medication. By the time the hospital authorities intervene to get the medication from a private

pharmacy, it's already too late..."

"Here, maternity care is free, but people aren't paid well. This leads to negligence and mistreatment of women by the providers."

"We have plenty of equipment and resuscitation kits. When we're given this equipment, there isn't a single technician to teach us how to use it."

Finally, the interviews highlighted direct shortcomings in the delivery of care and the caregiver-patient relationship. These include clinical delays and assessment errors (participants reported errors in diagnosing the severity of emergencies and a lack of responsiveness in initiating care), late referrals (registered nurses in health centers often transfer patients to referral hospitals at a stage that is too advanced in the complication), a detrimental relational climate (attitudes perceived as directive, moralizing, or stigmatizing on the part of caregivers discourage women from using health facilities), and exhaustion and demotivation (work overload coupled with perceived insufficient remuneration deteriorates the overall quality of care).

"The maternal deaths we see here are cases referred late by Registered Nurses."

"We, the providers, are also too capricious. We waste a lot of time judging the women who come to us instead of starting their care. Some women don't come to the facility anymore because of this behavior."

"People say we work hard, but we aren't paid enough. This is the root cause of the neglect."

La réduction durable de la mortalité maternelle dans la Province du Kasai ne peut s'appuyer sur une réponse isolée. Elle exige une approche intégrée agissant simultanément sur les trois leviers identifiés: communautaire, institutionnel et professionnel.

4. Discussion

The profile of the 708 women analyzed highlights a context of marked social vulnerability. A low level of education was observed among the women, with 67.80% having not progressed beyond primary school. There is a predominantly rural population, with 71.61% of the respondents residing in remote areas, zones characterized by geographical isolation and limited access to healthcare. The majority of the women were between 18 and 40 years old (91.53%) and were first-time mothers (59.89%) (**Table 1** and **Table 2**).

A discrepancy exists between the provincial ratio of the health information system (DHIS2: 119 deaths per 100,000 live births) and the hospital mortality rate observed in the study (25%, or 1 death for every 4 obstetric emergencies). This difference is explained by systemic underreporting within the DHIS2, linked to deaths occurring at home (outside of the healthcare system), gaps in the completeness of reports, and the absence of systematic audits. The 25% case fatality rate reflects the extreme severity of the cases treated and the inability of hospital facil-

ities to manage major obstetric emergencies. These results are consistent with data from the Demographic and Health Survey in the Democratic Republic of Congo [9], which confirm the persistence of a high level of maternal mortality in the country.

Multivariate analysis identified four independent determinants of maternal death. Obstetric hemorrhage (ORa = 6.72; 95% CI [4.25 - 10.62]) (Table 3 and Table 5) was the leading direct cause of death (76.84% of women who died). The mortality rate from an obstetric emergency is nearly seven times higher in the presence of uncontrollable bleeding. This finding reflects the lack of availability of safe blood products, the absence of emergency kits, and the delayed administration of uterotonics (e.g., oxytocin, misoprostol). This prevalence is widely documented internationally, in both low-resource and high-income countries [2] [12]. Comparable results have been reported in Abidjan, where hemorrhages accounted for approximately one-third of direct causes [13].

In contrast, eclampsia and maternal infections were not significantly associated with deaths in our study. This finding differs from some previous research [14] and could be explained either by the low frequency of these conditions during the study period or by diagnostic difficulties in peripheral settings, which often lack appropriate laboratory equipment.

A short interpregnancy interval (<2 years) triples the mortality rate (aOR = 3.30; 95% CI [1.99 - 5.48]). This leads to “maternal exhaustion syndrome,” characterized by uncorrected nutritional deficiencies and an increased risk of uterine atony, severe anemia, and placental complications [15] (Table 5).

Regarding the lack of skilled assistance, it has been noted that giving birth without the help of trained personnel (midwife, physician) more than doubles the mortality rate (aOR = 2.36; 95% CI [1.55 - 3.57]) (Table 5). The failure to detect dystocia or residual bleeding early transforms a manageable complication into a fatal one. The lack of skilled assistance during childbirth has been identified as a key factor in several African contexts, notably in Senegal [4].

The analysis shows a protective effect of multiparity compared to pauciparity (ORa = 0.6590; 95% CI [0.49 - 0.89]). This counterintuitive result may reflect a survival bias (Healthy Mother Effect): women who have experienced several pregnancies without major complications have developed more effective use of healthcare services or exhibit less vulnerable obstetric physiology than primiparous women who are confronted from the outset with unrecognized emergencies. Previous research shows an association between high multiparity and maternal deaths [16].

The bivariate analysis reveals a very high prevalence of malaria among the women who died (93.79% vs. 79.66%, $p < 0.0001$). Malaria caused by *Plasmodium falciparum* promotes hemolysis and maternal-fetal distress. This condition was thus the main indirect cause of death, which corroborates the data reported in Cameroon [5].

Clinical anemia was reported in 3.95% of deaths compared to 10.55% of survivors ($p = 0.0076$). This contrasts sharply with the findings of many previous stud-

ies that have linked this condition to maternal deaths [5] [11]. This paradoxical reversal is probably due to imputation or documentation bias: in patients who died rapidly from fulminant hemorrhage, the diagnosis of underlying chronic anemia was often not recorded in the medical file, unlike in stabilized patients (survivors) who underwent a complete blood count.

Regarding the three-delay model and the reality on the ground, qualitative data confirmed that mortality in Kasai stems from dysfunction at each stage of care: The first delay (decision to seek medical attention) is exacerbated by low levels of education, women's financial dependence on their partners, and late access to pre-natal consultations (often initiated in the third trimester). The second delay (access to care) is compounded by the isolation of rural areas, the cost of transportation, and the time it takes to transfer patients from health centers to general referral hospitals. The third delay (hospital care) is marked by drug shortages, the absence of functioning blood banks, a lack of expertise in resuscitation equipment, and staff demotivation (cemented by free maternity care not compensated by effective state subsidies). This systemic approach aligns with the findings of Bohous-sou *et al.* [13], who emphasized the combined involvement of individual, institutional, and professional factors. These observations reinforce the importance of a maternal mortality surveillance system that integrates these three levels of analysis.

These results can be extrapolated to other similar contexts, as the organization of the health system and the structural constraints of Kasai Province are comparable to those of other provinces in the DRC and many resource-limited countries.

5. Study Limitations

Despite the relevance of its results, this study had some limitations:

- 1) Data collection relied on routine registers, exposing the study to a risk of information bias (variable completeness and rigor among healthcare providers). This bias was mitigated, however, by the use of cross-referenced secondary sources (partograms and death review forms).
- 2) The lack of detail regarding the time to treatment and the actual quality of care at the time of the complication prevented a detailed analysis of the impact of the “three delays” (decision, access, and treatment). Triangulation with community member testimonies helped to mitigate this limitation.
- 3) The scarcity of published studies specific to Kasai Province limited direct comparisons with previous local data, a constraint partially offset by the use of national surveys (DHS).
- 4) The difficulty in clinically differentiating malaria from other febrile syndromes may have influenced the attribution of indirect causes. Nevertheless, the application of a strict operational definition (fever associated with a positive laboratory test) has strengthened the validity of the diagnoses made.

6. Conclusions

Maternal mortality remains a major public health problem in Kasai Province. This

study highlighted the persistence of largely preventable causes, revealing shortcomings both at the community level and within the health system.

The data collected revealed several critical factors. Three delays in delivery, lack of skilled birth attendants, low attendance at antenatal care services, delayed access to healthcare, maternal age over 40, and interpregnancy intervals of less than two years (closely spaced pregnancies) were the risk factors associated with maternal deaths. Direct obstetric causes were largely dominated by postpartum hemorrhage. Indirect causes were primarily related to gestational malaria (See **Table 6**).

Table 6. To sustainably reverse the trend of maternal mortality in Kasai, interventions must jointly target the three identified levers.

Level	Priority Action Areas
Community	Active promotion of Family Planning (to space births by more than 2 years), awareness of early ANC follow-up from the 1st trimester, and functional literacy of women.
Institutional	Effective funding for free childbirth, creation of a provincial network of blood banks (or emergency blood depots) and securing supplies of essential medicines (oxytocics, antimalarials).
Professional	Mandatory continuing education in the management of obstetric and neonatal emergencies (SONU), strict supervision of the referral system by Registered Nurses (IT) and awareness of the humanized reception of patients.

Conflicts of Interest

The authors declare no conflicts of interest.

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