

Prevalence of Obstetric Referrals in the Dassa-Glazoué Health District, Benin, from 2020 to 2024

Aurelle Yeyinou Ahouingnan^{1,2}, Ingrid Bénédicté Olowo^{3,4*}, Fanny Nm Hounkponou^{2,3,5}, Merveille Ahoboko⁵, Akpona Simon^{1,5}

¹Departmental University Hospital of Borgou, Parakou, Benin

²Faculty of Medicine, University of Parakou, Parakou, Benin

³Departmental University Hospital of Oueme Plateau, Porto-Novo, Benin

⁴Faculty of Science and Health, University of Abomey Calavi, Abomey Calavi, Benin

⁵National School for the Training of Senior Technicians in Public Health and Epidemiological Surveillance (ENATSE) at the University of Parakou, Parakou, Benin

Email: *olowingrid@yahoo.fr, ahouingnanaurelie@gmail.com, noumafanny@yahoo.fr, sysie2006@yahoo.fr, elboutraguero@yahoo.fr

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Abstract

Introduction: Obstetric referrals remain a public health challenge. **Objective:** To evaluate the prevalence of obstetric referrals in the DASSA-Glazoué health district. **Methods:** This was a cross-sectional analytical study with retrospective data collection over a five-year period. The study population consisted of women who were referred within the Dassa-Glazoué health district (Zone Hospital and l'Abbraccio Hospital). Women referred between January 1, 2020, and December 31, 2024, were included, while incomplete or unusable medical records of non-referred women were excluded. The sampling exhaustive was used. Data collected on KoboCollect from June 18 to July 20, 2025, were analyzed using Epi Info 7 software. Text and tables were processed using Microsoft Word 2016 and Excel, and Chi-square or Fisher's exact tests were applied. Informed consent and ethical committee approval were observed. **Results:** The prevalence of referred women was 29.84%. The mean age was 26.56 ± 6.62 years, ranging from 12 to 48 years. The age groups [24 - 31] years (35.37%) and [17 - 24] years (34.64%) were most represented. The mean parity was 1.87, with pauciparous women (50.52%), primiparous (30.31%), nulliparous (32.44%), and multiparous (27.54%), and the majority resided in urban areas (70.16%). Most referrals came from health centers (91.41%), had a referral form (93.83%), and had intravenous access prior to transfer (74.49%). Transport time was short for 42.20% of cases (arrival within 2 hours), but motorcycles were the main mode of transport (58.77%). The main reasons for

referral were inadequacy of technical facilities (46.43%). Severe hypertension/preeclampsia-eclampsia, post-term pregnancy and pain as the reason for admission was significantly associated with an increased risk of mortality ($p < 0.001$).

Keywords

Prevalence, Obstetric Referrals, Dassa-Glazoué (Benin) 2020-2024

1. Introduction

Pregnancy complications sometimes result in obstetric emergencies requiring evacuation and referral to hospitals. These obstetric emergencies necessitate prompt and effective management to prevent maternal and fetal deaths. In Africa, gynecological and obstetric emergencies are estimated to account for 30% - 98% of overall maternal mortality, with hemorrhage being the leading cause [1]. In Benin, obstetric referrals are estimated to be associated with 70% - 90% of maternal deaths in hospitals [2]. They represent a significant public health issue, predominantly affecting developing countries, and reflect the development level of their healthcare systems [3]. Obstetric referrals are characterized by high frequency [4] [5] and often require evacuation from peripheral maternity centers, with both maternal and fetal prognosis being uncertain. This prognosis is worsened by poor prenatal follow-up, inadequacies in the management of parturients at health centers, geographic inaccessibility of referral centers, and lack of logistical, material, and financial resources. No study has been conducted on referrals in the DASSA-Glazoué health district. The objective of this study was to assess the prevalence of obstetric referrals in the DASSA-Glazoué health district.

2. Methods

This was a cross-sectional analytical study with retrospective data collection from January 1, 2020, to December 31, 2024, a period of five years. The study population included all women referred to two hospitals in the Dassa-Glazoué health district (Zone Hospital and l'Abbraccio Hospital) during the study period. All women referred between January 1, 2020, and December 31, 2024, were included. Excluded were incomplete or unusable medical records of non-referred women. sampling consisted of a census of all eligible referred patient records. The sample size corresponded to the total number of records meeting the inclusion criteria. The dependent variable was the prevalence of referred women during the study period. Independent variables included socio-demographic characteristics, referral-related factors, admission status, and diagnoses at referral and admission. A digital questionnaire on KoboCollect, configured on a smartphone, was used for data collection after reviewing medical records. Data were collected from June 18 to July 20, 2025, and analyzed using Epi Info 7 software. Frequency measures and

bivariate analyses were used to describe and identify associated factors. Qualitative variables were expressed as proportions, and quantitative variables as means with standard deviations. Text processing was performed using Microsoft Word 2016, and tables and graphs were created using Microsoft Excel 2016. Comparisons of qualitative variables were performed using Chi-square or Fisher's exact tests depending on theoretical counts. Statistical significance was set at $p < 0.05$.

Approval was obtained from the protocol review committee of the National School for Training Public Health Technicians and Epidemiological Surveillance (ENATSE), the Local Ethics Committee for Biomedical Research of the University of Parakou (CLERB-UP), and local health authorities. Informed consent and confidentiality were ensured.

3. Results

A total of 2771 women were included, of whom 827 were referred, corresponding to a prevalence of 29.84%. Among these, 20 maternal deaths and 18 fetal deaths were recorded, representing a frequency of 0.72%.

3.1. Socio-Demographic Characteristics of Referred Women

- **Age**

The mean age of referred women was 26.56 ± 6.62 years, ranging from 12 to 48 years. Most women were aged 24 - 31 years (36.52%), followed by the 17 - 24 years age group (35.67%), 32 - 38 years (18.62%), over 38 years old (6.17%) and under 17 years old 3.02%.

- **Gravidity and parity**

The mean gravidity of the women was 3.02 ± 2.11 , with paucigravidae accounting for 50.52%, primigravidae 30.31%, multigravidae 20.21%, and grand multigravidae 13.24%.

The mean parity was 1.87 ± 1.97 , with nulliparous women at 32.44%, pauciparous 27.54%, primiparous 21.26%, multiparous 12.99%, and grand multiparous 5.77%.

- **Place of residence and socio-professional occupation**

Most referred women resided in urban areas (70.16%), and 40.09% were homemakers. The table presents the distribution of referred women according to place of residence and socio-professional occupation (**Table 1**).

Table 1. Distribution of referred women in the Dassa-Glazoué Health District from 2020 to 2024 according to place of residence and socio-professional occupation.

	Numbers	Percentage (%)
Place of residence		
Urban	580	70.13
Rural	233	28.17
Not specified	14	1.70

Continued

Socio-professional occupation		
Housewife	331	40.02
Civil servant	70	8.46
Artisan	154	18.62
Farmer	29	3.51
Trader/Vendor	127	15.36
Pupil/Student/Apprentice	96	11.61
Not specified	20	2.42

3.2. Characteristics Related to the Referral

✓ Referral center

Most women (91.41%) came from a health center (**Table 2**).

Table 2. Distribution of referred women according to the referral center in the Dassa-Glazoué Health District from 2020 to 2024.

	Numbers	Percentage (%)
Referral center		
Health center	756	91.41
Private clinic	21	2.54
District hospital	45	5.44
Medical practice/Care facility	01	0.12
Not specified	04	0.48

✓ Referral with form, intravenous access, qualification of referring personnel, and duration of stay at the referring center

Among the women received, 58.52% were in the active phase of labor, of whom 48% had a partograph. They were referred with a referral form and intravenous access in 93.83% and 74.49% of cases, respectively. Referrals were mainly made by midwives (69.65%), and the duration of stay at the referring center was one day (1 day) in 88.97% of cases (**Table 3**).

Table 3. Distribution of referred women in the Dassa-Glazoué Health District from 2020 to 2024 according to referral with form and intravenous access, qualification of the referring personnel, and duration of stay at the referring center.

	Numbers	Percentage (%)
Referred with referral form		
Yes	776	93.83
No	51	6.17
Referred with intravenous access		
Yes	616	74.49
No	211	25.51

Continued

Referred with partograph		
Yes	739	89.36
No	88	10.64
Qualification of the referring healthcare provider		
General practitioner	03	0.36
Gynecologist	06	0.73
Midwife	576	69.65
Nurse	93	11.25
Nursing assistant	88	10.64
Not specified	61	7.38
Length of hospital stay		
0 day	66	8.23
1 day	734	88.75
2 days	25	3.02

✓ **Time between referral and arrival, referral conditions, and reason for referral**

At the time of referral, 42.20% of women arrived at one of the two hospitals within less than 2 hours, with motorcycles being the main mode of transport (58.77%). Inadequate technical facilities were the most common reason for referral from 2020 to 2024, accounting for 46.43% according to the time interval (**Table 4**).

Table 4. Distribution of referred women in the Dassa-Glazoué Health District according to time between referral and arrival, referral conditions, and reason for referral.

	Numbers	Percentage (%)
Time interval between referral and arrival		
<2 hours	349	42.20
2 - 4 hours	278	33.62
>4 hours	155	18.74
Not specified	45	5.44
Distance traveled before arrival at the receiving center		
<10 km	102	12.33
11 - 15 km	186	22.49
16 - 20 km	227	27.45
21 - 25 km	149	18.02
26 - 30 km	99	11.97
31 - 40 km	64	7.74

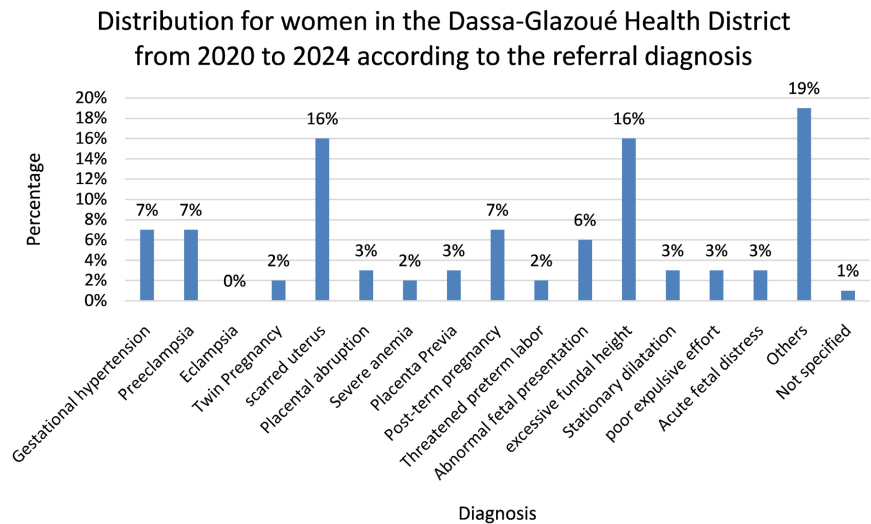
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Mode of referral/transportation		
Ambulance	134	16.20
Motorcycle	486	58.77
Non-medical vehicle	127	15.36
Not specified	80	9.68
Reason for referral		
Lack of medication	09	1.09
No response to treatment	25	3.02
Lack of diagnostic facilities	73	8.83
Lack of qualified personnel	108	13.05
Inadequate technical facilities	384	46.43
Others*	05	0.60
Not specified	223	26.96

Km: kilometer Others*: Better management, patient request, no issues reported.

3.3. Referral Diagnosis

Pregnant women were mainly referred for excessive uterine height (18%) and for a scarred uterus (16%) (Figure 1).



Others: cord prolapse, polyhydramnios; bleeding during pregnancy, perinatal asphyxia; macrosomia; labor complications; anhydramnios.

Figure 1. Distribution of women in the Dassa-Glazoué Health District from 2020 to 2024 according to the referral diagnosis.

3.4. General Condition at Admission

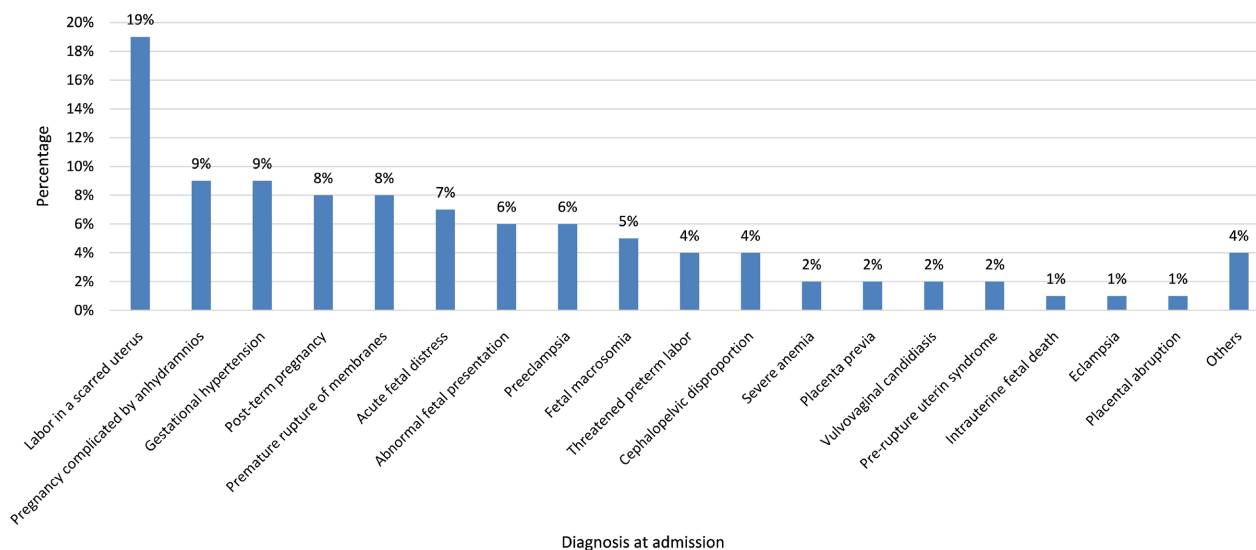
- Overall condition and level of consciousness

At admission, the general condition was preserved in 98.52% of women, with a good level of consciousness in 98.99% of these women.

- **Diagnosis at admission**

The main diagnoses at admission were gestational hypertension (9%), post-term pregnancy (8%), and premature rupture of membranes (8%) and Labor in a scarred uterus (**Figure 2**).

Distribution of referred women in the Dassa-Glazoué Health District from 2020 to 2024 according to the diagnosis at admission



Others: cord prolapse, polyhydramnios; bleeding during pregnancy, perinatal asphyxia; labor complications; anhydramnios.

Figure 2. Distribution of referred women in the Dassa-Glazoué Health District from 2020 to 2024 according to the diagnosis at admission.

3.5. Relationship between Maternal Mortality and Referral-Related Characteristics

The reason for admission was statistically associated with maternal deaths. Indeed, pregnant women admitted for pain ($p < 0.001$) had a 0.16 times lower risk of death (**Table 5**).

Table 5. Relationship between maternal mortality and obstetric referral characteristics in the Dassa-Glazoué Health District from 2020 to 2024.

Reason for admission	Death				PR	IC _{95%}	P-value
	N	Yes	No				
	827 N	%	n	%			
Pallor	09	00	09	100	-	-	-
Pain	280	07	273	97.50	0.16	[0.06 - 0.45]	<0.001
Altered level of consciousness	27	00	27	100	-	-	-

Continued

Headache	100	03	3.0	97	97.0	1.37	[0.36 - 5.2]	0.641
Hemorrhage	89	03	3.37	86	96.63	1.54	[0.41 - 5.84]	0.522
Eclampsia	02	00	0.0	02	100	-	-	-
Premature rupture of membranes (PROM)	320	07	2.19	313	97.81	01		
Reason for referral								
Lack of medication	109	00	0.0	09	100	-	-	
No response to treatment	53	00	0.0	25	100	-	-	
Lack of diagnostic facilities	173	00	0.0	73	100	-	-	
Lack of qualified personnel	108	00	0.0	108	100	-	-	
Inadequate technical facilities	384	04		480		01		

PR* = Prevalence report, CI** = Confidence Interval.

4. Discussion

4.1. Prevalence of Obstetric Referrals

The prevalence of obstetric referrals was 29.84%, indicating a high proportion of referrals, which reflects congestion at referral centers or inadequate capacity of primary health care facilities to manage obstetric complications. This rate is comparable to that reported in other settings in Benin by Tshabu Aguemon *et al.* at the University Clinic of Gynecology and Obstetrics (CUGO) of Benin in 2012, where the referral rate was 30.38% [6]. This finding highlights the limitations of primary health care structures in managing a substantial proportion of obstetric complications and underscores the absolute necessity of an effective referral system.

A total of 20 maternal deaths (0.72%), 18 fetal deaths, and a case fatality rate of 0.024 were recorded. Although these rates (mortality and case fatality) appear relatively low, they remain concerning in a context where the majority of maternal deaths are preventable through timely and appropriate care. The World Health Organization emphasizes that the persistence of maternal deaths within health facilities often reflects delays in the decision to refer, delays in transportation, or delays in the provision of adequate care upon arrival commonly described as the “three delays” model [1].

The concomitant occurrence of 18 fetal deaths highlights the negative impact of severe obstetric complications not only on maternal survival but also on fetal outcomes. This association between obstetric referral and adverse perinatal outcomes has been widely documented by Say *et al.* confirming that complicated pregnancies requiring referral constitute a high-risk group for both maternal and fetal morbidity and mortality [7].

4.2. Sociodemographic Profile

The mean age was 26.56 years, with most women aged 24 - 31 years. Ghardallo in

Tunisia found a mean age of 29.5 years [8], and Ibrahima in Guinea reported 25.1 years [9], closely matching our study and reflecting the reproductive-age population.

The mean parity was 1.87, with a majority being nulliparous or pauciparous, which could indicate a high-risk population or inadequate management of early pregnancies. Ghardallo *et al.* reported 47.6% nulliparous and 22.8% primiparous women [8], similar to our findings.

Most women resided in urban areas (70.16%), reflecting better accessibility, but urbanization alone did not reduce referrals or complications. Ibrahim in Guinea reported 77% of women coming from urban areas [9], consistent with our context, though some studies, such as Ghardallo *et al.* in Tunisia, report a higher proportion of rural women, depending on geographic context and inclusion criteria [8].

4.3. Referral-Related Characteristics

Most women came from health centers (91.41%), indicating a centralized referral structure, which may cause delays and overcrowding. Takai *et al.* in Nigeria (2023) reported that 70% - 90% of referrals came from primary-level centers [10], noting that centralization overloads referral hospitals. This reflects strong dependence on secondary or tertiary centers, as in pyramidal health systems in many African countries.

Most women were referred with a referral form (93.83%) and intravenous access (74.49%). Neelam *et al.* in Bangladesh (2015) reported frequent gaps in pre-transfer preparation [11]. The presence of a formal referral form and initial treatment (intravenous access, stabilization, emergency care) remains insufficient in many African health systems, increasing the risk of severe complications upon arrival. The high rates of referral documentation and intravenous access on admission are rather favorable and reflect a good level of formal organization and structured management of the referral process. This represents a strength of the health system in Benin. However, these indicators do not necessarily guarantee the quality or timeliness of care, as highlighted in the work of Leonardo *et al.* and Takai *et al.* [9] [11].

A short duration of stay at the referring center (1 day for 88.97% of women) may reflect emergency management but also potential gaps in post-referral follow-up.

4.4. Referral Delays and Conditions

Women (42.20%) arrived within 2 hours, a relatively short delay, though this does not ensure quality of care. Neelam (2008) reported delays exceeding 3 hours [10]. Time is a crucial factor in managing obstetric emergencies. The majority used motorcycles (58.77%), reflecting logistical and infrastructure challenges and increased transport risk (accidents, delays). Extensive use of motorcycles, taxis, or community transport has been described by Roger in Ouagadougou [12]. Leonardo [11] noted that even when transport reaches the facility, institutional delays

may still result in deaths. Kyei-Nimakoh highlighted two of the “three delays” in obstetric care, emphasizing transport time and delay at arrival for receiving appropriate care [13]. These obstacles are often interdependent and can cause significant delays in emergency obstetric management [14] [15].

The main reason for referral was inadequate technical facilities (46.43%), reflecting structural weaknesses in primary health centers and the need for equipment and training improvements.

4.5. Referral Diagnosis

The main indications for referral were excessive uterine height (18%) and scarred uterus (16%), representing frequent obstetric complications requiring specialized care. Neelam in Bangladesh reported prematurity (64.5%) and hypertension (27.6%) as referral diagnoses [10]. Most women did not present with altered general condition at admission (98.52%), suggesting relatively early intervention or case selection.

4.6. Relationship between Admission Reason, Referral, and Mortality

Pain as the reason for admission was significantly associated with an increased risk of mortality ($p < 0.001$), suggesting that pain may represent a marker of clinical deterioration or severe obstetric complications [16]. Leonado reported that among maternal deaths, direct causes including hemorrhage, sepsis, uterine rupture, and complications of prolonged or obstructed labor were predominant [11]. Takai, in Nigeria, identified indications such as pre-eclampsia, eclampsia, and hemorrhage as major contributors to maternal mortality [9]. In a study conducted by Ugochukwu, the leading causes of maternal death were eclampsia/pre-eclampsia (approximately 41%), obstetric hemorrhage (37.5%), and respiratory distress, with an overall mortality rate of 48% [17]. These findings corroborate that hypertensive disorders of pregnancy remain among the leading causes of maternal mortality, particularly in sub-Saharan Africa [18].

5. Conclusion

The prevalence of referrals was high in the Dassa-Glazoué Health District from 2020 to 2024. The formal referral system is relatively well-structured (health centers, hospital, referral forms, intravenous access) but weakened by technical insufficiencies, non-medicalized transport, organizational delays, and limited technical capacity. The strong association between specific diagnoses (uterine rupture, infection, severe hypertension) and mortality underscores the critical importance of quality and rapid management from the time of referral.

6. Study Limitations

This study has methodological limitations (retrospective design, reliance on medical records, absence of multivariate analysis). Additionally, important aspects are

often missing in such studies: actual quality of transfers, time from referral decision to departure, stabilization before transport, accompaniment during transport, availability of resources (blood, medications, personnel), quality of care on arrival, and post-operative follow-up. Prospective, ideally multicenter studies with comprehensive data collection, including transport, stabilization, care, and follow-up, are needed to better assess the impact of referral on maternal and fetal morbidity and mortality.

Ethical Approval

Informed consent for all participants.

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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