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Assessment of the impact of health insurance medical advisors' involvement on partograph utilization in the context of free maternity care: an analytical cross-sectional study conducted in maternity units of the Lemba Health Zone, Democratic Republic of the Congo

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Abstract

The quality of partograph documentation is a key component of obstetric care safety. In the Democratic Republic of the Congo (DRC), implementation of the free maternity care policy was accompanied by an obstetric record audit mechanism conducted by medical advisors. Based on a clinical audit, this comparative study used a checklist adapted from the French National Agency for Accreditation and Evaluation in Health (ANAES) framework to assess changes in partograph documentation compliance before and after introduction of the free maternity care policy in twelve maternity units of the Lemba Health Zone. A total of 844 partographs were selected through systematic sampling across two comparable periods. Comparisons were performed using Pearson's chi-square test or Fisher's exact test, with statistical significance set at $p < 0.05$. The median age of parturient women was 28 years (interquartile range [IQR]: 8 years; range: 16–44 years). The number of criteria achieving a compliance rate of at least 75% increased from 23 to 31 out of the 34 assessed criteria. The largest improvements were observed in the documentation of laboratory examinations (36.0% vs. 82.0%), integration of the partograph into the medical record (36.0% vs. 77.7%), description of amniotic fluid characteristics (66.0% vs. 96.2%), and monitoring of women during the immediate postpartum period (39.0% vs. 86.0%) ($p < 0.001$ for each comparison). However, documentation of fetal position (57.6%) and level of the presenting part (58.1%) remained below the target threshold. Overall, compliance improved between the two periods, although some technical obstetric parameters remained insufficiently documented. These findings highlight the need to strengthen healthcare providers' competencies in clinical monitoring and obstetric documentation.

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1. Introduction

Reducing maternal and neonatal morbidity and mortality remains a major priority of public health policies in sub-Saharan Africa, particularly in the Democratic Republic of the Congo (DRC) [1].

According to the World Health Organization (WHO), maternal mortality remains a major concern in Africa, where more than 32 women die every hour from complications related to pregnancy, childbirth, or the postpartum period, including approximately three deaths occurring every hour in the DRC [2, 3]. According to the third Demographic and Health Survey (DHS III-DRC) [4], the maternal mortality ratio was estimated at 746 deaths per 100,000 live births during the seven years preceding the survey, a level far above the Sustainable Development Goal 3 target of fewer than 70 maternal deaths per 100,000 live births. This places the country among those with the highest maternal mortality ratios worldwide [2]. Among maternal deaths, direct obstetric causes account for approximately 89% and are mainly attributable to hemorrhage (47%), hypertensive disorders of pregnancy, including preeclampsia and eclampsia (9%), uterine rupture (8%), severe infections (3%), and abortion-related complications (2%). Indirect obstetric causes account for the remaining 11%, primarily anemia (9%) and malaria (2%) [5]. A substantial proportion of these deaths could have been prevented through early detection of complications and timely, evidence-based obstetric management.

Among the clinical interventions recommended to improve labor monitoring and prevent obstetric complications, the WHO-standardized partograph occupies a central position [6]. When properly completed, this graphical tool enables healthcare providers to monitor labor progression, identify dystocia at an early stage, and facilitate timely decision-making regarding appropriate obstetric interventions [7]. Its effective use contributes to improved maternal and neonatal outcomes [8]. Furthermore, as a medico-legal document integrated into the patient's medical record, the quality of partograph documentation is of critical importance for both patient safety and healthcare providers' professional accountability [9].

Despite its adoption in numerous health systems, several international and national studies have highlighted persistent shortcomings in partograph documentation quality, particularly regarding completeness, readability, and traceability. In Burkina Faso, only 57.9% of evaluated partographs were considered to have a satisfactory quality level [10]. Similarly, a study conducted in Tanzania showed that out of a total of 196 partographs, only 59% were of satisfactory quality and achieved an acceptable level of compliance [11]. In Mali, a study conducted at the Referral Health Center of Commune V of the District of Bamako reported that only 18.85% of partographs were adequately completed [12]. These findings demonstrate the persistence of major deficiencies in obstetric documentation quality, which may negatively affect both the quality of care and continuity of patient management.

Since the implementation of the free maternity care policy in September 2023, the first operational component of Universal Health Coverage (UHC) in the DRC, the financing system for obstetric services has undergone a major transformation based on a third-party payment mechanism and subsidies provided to accredited health facilities. This policy covers antenatal care consultations, obstetric ultrasound examinations, normal and cesarean deliveries, essential newborn care, vaccination services, postnatal consultations, family planning services, and essential medicines [13]. To ensure the quality of publicly funded services and the efficient use of public resources, health insurance medical advisors now play a central role in the regulatory process. They conduct medico-technical and medico-legal audits of obstetric records, particularly partographs, whose compliance represents a key requirement for triggering reimbursement of services by the Health Solidarity Fund [13, 14]. Although the use of financial incentive mechanisms conditioned on compliance with quality standards has been widely documented across different health systems, scientific evidence remains limited regarding their influence on improving clinical documentation practices in the context of the DRC.

Within this context, the present study aimed to assess the effect of health insurance medical advisors' involvement on partograph documentation compliance in maternity units of the Lemba Health Zone (HZ). More specifically, it sought to measure changes in partograph quality indicators following the introduction of this institutional control mechanism.

2. Methods

2.1. Study design

This was an analytical cross-sectional study based on a retrospective clinical audit of partographs, conducted according to the quality criteria defined in the recommendations of the French National Agency for Accreditation and Evaluation in Health (Agence Nationale d'Accréditation et d'Évaluation en Santé, ANAES) [15].

To assess the effect of health insurance medical advisors' involvement within the framework of the free maternity care policy, data were compared between two distinct nine-month periods. The post-intervention period extended from September 5, 2023, corresponding to the official launch date of the free maternity care policy in the DRC, to May 2024. This period was compared with a historical reference period covering the same months of the previous year, from September 2022 to May 2023, corresponding to the period before the implementation of this policy.

2.2. Study setting

The study was conducted in twelve healthcare facilities located in the Lemba HZ, within the city-province of Kinshasa, DRC. The Lemba HZ comprises fourteen health areas served by twenty healthcare facilities, including twelve reference health centers, five health centers with triage units, one general referral hospital, and two medical technical institutes. The HZ covers an area of 23.7

Table 1: Distribution of the sample according to healthcare facilities.

	Baseline		Post-intervention	
Healthcare facility	Deliveries	Sample	Deliveries	Sample
Mont-Amba Hospital Center	351	39	540	45
Soprose Health Center	90	10	252	21
Alliance Clinic	117	13	192	16
Bénédicte Health Center	153	17	288	24
CUEBC Health Center	108	12	312	26
Kimbanguist Health Center	27	3	36	3
Lisanga Health Center	1233	137	1188	99
Saint Gabriel Center	1242	138	1188	99
Pax Clinic	81	9	96	8
University Clinic of Kinshasa	207	23	384	32
CMG Health Center	81	9	312	26
Marcelo Medical Center	99	11	276	23
Total	3786	422	5064	422

km², with an estimated population of 272,425 inhabitants, corresponding to a population density of 11,495 inhabitants/km². It is bordered to the north by the Limete and Matete HZ, to the south by the Mont-Ngafula I HZ, to the east by the Ngaba HZ, and to the west by the Kisenso and Matete HZ.

2.3. Study population

The study population consisted of all partographs from women who delivered in maternity units of subsidized healthcare facilities within the Lemba HZ during the two study periods. The partographs included both vaginal deliveries and cesarean sections performed after the onset of labor.

2.4. Eligibility criteria

Inclusion criteria. Partographs from obstetric records of women who delivered either vaginally or via an emergency intrapartum cesarean in maternity units of healthcare facilities benefiting from the free maternity care policy in the Lemba HZ during the two study periods were included.

Exclusion criteria. Partographs were excluded if they belonged to women admitted during the terminal active phase of labor (cervical dilation ≥ 8 cm) or cases involving elective cesarean sections. Additionally, partographs documenting labor associated with fetal death in utero (FDIU) were excluded.

2.5. Sample size determination

The minimum sample size was calculated using Cochran's formula adapted for cross-sectional studies [16]:

$$n \geq \frac{Z_\alpha^2 p(1-p)}{d^2}. \tag{1}$$

The parameters used in Eq. (1) for sample size calculation were as follows: in the absence of previous data on the proportion of partographs meeting quality criteria in the Lemba HZ, an expected proportion of 50% was assumed. The confidence level was set at 95% ($Z_\alpha = 1.96$), with an acceptable absolute margin of error of 5% ($d = 0.05$). Based on these assumptions, the minimum required sample size was estimated at 384 partographs for each study period.

To account for potentially unusable records or missing data, a 10% increase was applied, corresponding to 38 additional partographs. Therefore, the final minimum sample size was set at 422 partographs per analysis period.

2.6. Sampling procedure

Sampling was conducted in three stages. First, the Lemba Health Zone was purposively selected based on the availability, accessibility, and completeness of data related to the free maternity care policy. Second, all healthcare facilities benefiting from this policy and providing maternity services were included exhaustively. Third, partographs were selected through systematic sampling from delivery registers. For the period from September 2022 to May 2023, a sampling interval of 1/9 was applied among a total of 3,786 deliveries. For the period from September 2023 to May 2024, a sampling interval of 1/12 was applied among a total of 5,064 deliveries.

2.7. Data collection instrument

Data were collected using a clinical audit checklist specifically developed for this study. The checklist, integrated into the KoboCollect mobile application, was developed based on the ANAES reference framework [15] for assessing the quality of partograph documentation.

The checklist assessed various domains of obstetric monitoring, including general partograph presentation, maternal and fetal parameters, administered treatments, performed interventions, as well as elements related to delivery and immediate postpartum monitoring. The original ANAES framework included 37 assessment criteria; however, only 34 criteria were retained after adaptation to the local context. This adaptation considered the technical capacity available in the maternity units studied, the partograph models used in participating facilities, and the documentation requirements related to the reimbursement mechanism financed through the Health Solidarity Fund. The final assessment tool consisted of six main dimensions: (i) general partograph presentation (11 criteria), (ii) fetal monitoring (4 criteria), (iii) maternal monitoring (7 criteria), (iv) treatments and therapeutic interventions (4 criteria), (v) documented medical procedures and obstetric events (2 criteria), and (vi) labor progression and immediate postpartum monitoring (6 criteria).

One week before the beginning of data collection, the tool was pretested on five randomly selected partographs from a maternity unit in the Mont-Ngafula I HZ, a neighboring HZ with organizational and contextual characteristics comparable to those of the Lemba HZ. This pretest assessed item comprehension, feasibility of data collection, and allowed necessary adjustments to the final version of the tool.

2.8. Data collection

Data collection was conducted by a team of six investigators, all physicians, recruited according to predefined criteria and previously trained in the use of the clinical audit checklist. The principal investigator provided daily supervision of the data collection process. All data were collected through retrospective document review of selected partographs according to the predefined eligibility criteria. Data completeness checks and resolution of potential discrepancies in interpretation were performed before submission of completed forms to the server.

2.9. Data management and statistical analysis

Data collected through the KoboCollect application were transferred to a secure server and exported into Microsoft Excel format for verification, cleaning, and preparation of the analytical database. Statistical analysis was performed using Stata version 18. Each partograph assessment criterion was compared with the requirements of the ANAES reference framework. Variables were coded into three categories: “yes” when the criterion was met, “no” when it was not met, and “not applicable” when the criterion could not be assessed due to clinical circumstances.

For each criterion, the compliance rate was calculated by excluding observations classified as “not applicable” from the denominator. According to ANAES recommendations, a criterion was considered satisfactory when its compliance rate reached at least 75%. Categorical variables were described using absolute frequencies and proportions (%). Quantitative variables were presented using appropriate measures of central tendency and dispersion according to their distribution.

Normality of distributions was assessed using the Kolmogorov–Smirnov test. Comparisons between the two study periods were performed using Pearson’s chi-square test for categorical variables or Fisher’s exact test when chi-square assumptions were not met. The statistical significance threshold was set at $p < 0.05$.

2.10. Ethical considerations

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The research protocol received approval from the Ethics Committee of the School of Public Health of the University of Kinshasa (reference: ESP/CE/147/2024). Prior administrative authorization was also obtained from the managers of the participating healthcare facilities before accessing medical records. Given the retrospective nature of the study, no direct interaction with patients occurred. Data confidentiality was ensured through systematic anonymization of data collection forms. No information that could identify women who delivered (names, identifiable medical record numbers, or any other personal identifiers) was recorded in the analytical database.

3. Results

3.1. Sociodemographic characteristics of mothers

Regarding sociodemographic characteristics, the median age of women who delivered was 28 years (interquartile range [IQR]: 8 years; range: 16–44). Women aged 25–29 years represented the largest proportion of the study sample (33.53%). The majority of participants were married (78.44%). Regarding obstetric characteristics, multiparous women represented the largest proportion of participants, accounting for 57.11% of cases. In terms of occupational status, women without paid employment, mainly housewives, constituted the most represented category (68.84%) (Table 2).

Table 2: Sociodemographic characteristics of mothers.

Variable	Category	Frequency	%
Age group (years)	15–19	32	3.79
	20–24	168	19.91
	25–29	283	33.53
	30–34	222	26.30
	35–39	118	13.98
	40–44	21	2.49
Parity	Nulliparous	113	13.39
	Primiparous	249	29.50
	Multiparous	482	57.11
Marital status	Married	662	78.44
	Single	182	21.56
Occupation	Housewife	581	68.84
	Retailer	81	9.60
	Private-sector employee	10	1.18
	Civil servant	120	14.22
	Informal laborer	52	6.16

3.2. Assessment criteria for partograph presentation

Table 3 presents variations in partograph presentation criteria between the two study periods. The largest improvements concerned the traceability of laboratory examinations, with compliance increasing from 36.0% to 82.0% ($p < 0.001$), and the integration of the partograph into the medical record, which increased from 36.0% to 77.7% ($p < 0.001$). Compliance with the recommended hourly frequency of partograph completion also improved significantly, increasing from 69.0% to 90.8% ($p < 0.001$). Similarly, documentation of the time of each examination increased from 85.0% to 93.8% ($p < 0.001$). Identification of the midwives responsible for monitoring increased from 82.0% before the intervention to 94.8% after the intervention ($p < 0.001$). No statistically significant difference was observed regarding the physical condition of the partograph paper form ($p = 0.124$). Some criteria achieved 100% compliance during both study periods, including readability of recorded information, indelibility of entries, identification of the woman in labor, and documentation of the date and time of admission.

3.3. Assessment criteria for fetal monitoring

The results of the assessment of fetal monitoring criteria are presented in Table 4. Documentation of fetal presentation increased from 87.4% to 91.7% ($p = 0.048$). The recording of fetal position also improved, increasing from 47.6% to 57.6% ($p = 0.004$). Documentation of fetal heart rate increased from 90.8% to 95.7% ($p = 0.004$), while grading of the level of presentation improved from 46.4% to 58.1% ($p = 0.001$).

3.4. Assessment criteria for maternal monitoring

As shown in Table 5, compliance with documentation of amniotic fluid characteristics on the partograph increased from 66.0% to 96.2% ($p < 0.001$). Assessment of the obstetric pelvis improved from 37.0% to 66.1% ($p < 0.001$), while documentation of the status of the amniotic sac increased from 76.0% to 95.0% ($p < 0.001$). Recording of uterine contractions increased from 82.0% to 96.2% ($p < 0.001$), whereas documentation of cervical parameters, including effacement and dilation, improved from 74.0% to 91.7% ($p < 0.001$). Recording of maternal vital signs (blood pressure, temperature, and pulse) also increased from 62.0% to 77.7% ($p < 0.001$). However, no statistically significant difference was observed regarding assessment of maternal behavior, with compliance increasing from 98.0% to 99.3% ($p = 0.203$).

3.5. Assessment criteria for therapeutic interventions

According to Table 6, documentation of the prescriber's identity for each therapeutic prescription increased from 83.0% to 96.5% ($p < 0.001$). Similarly, documentation of the medication administration route improved from 98.0% to 99.5% ($p = 0.034$). However, no statistically significant difference was observed regarding the completeness of medication names, with compliance increasing from 99.0% to 99.5% ($p = 0.451$), nor for dosage documentation, which increased from 97.0% to 98.8% ($p = 0.086$).

3.6. Assessment criteria for procedures and event markers

According to Table 7, documentation of urinary catheterization and urine output increased from 67.4% to 100.0% ($p < 0.001$). Similarly, documentation of membrane rupture, whether spontaneous or artificial, improved from 92.0% to 98.1% ($p < 0.001$).

Table 3: Assessment criteria for partograph presentation.

Variable	Category	Baseline n (%)	Post-intervention n (%)	Difference (percentage points)	χ^2	p-value
The hard copy is in good condition	Yes	418 (99.1)	422 (100.0)	0.9	–	0.124
	No	4 (0.9)	0 (0.0)			
All entries are legible	Yes	421 (99.8)	422 (100.0)	0.2	–	1.000
	No	1 (0.2)	0 (0.0)			
All entries are documented in permanent ink	Yes	422 (100.0)	422 (100.0)	0.0	–	–
	No	0 (0.0)	0 (0.0)			
The partograph is integrated into the medical record	Yes	150 (35.5)	328 (77.7)	42.2	152.85	< 0.001*
	No	272 (64.5)	94 (22.3)			
The identity of the woman in labor is documented	Yes	422 (100.0)	422 (100.0)	0.0	–	–
	No	0 (0.0)	0 (0.0)			
The partograph documents the names of the midwives	Yes	347 (82.2)	400 (94.8)	12.6	32.72	< 0.001*
	No	75 (17.8)	22 (5.2)			
The partograph documents the date and time	Yes	422 (100.0)	422 (100.0)	0.0	–	–
	No	0 (0.0)	0 (0.0)			
The time of each examination is precisely documented on the partograph	Yes	358 (84.8)	394 (93.4)	8.5	15.81	< 0.001*
	No	64 (15.2)	28 (6.6)			
The partograph is completed according to the hourly schedule	Yes	290 (68.7)	383 (90.8)	22.0	63.43	< 0.001*
	No	132 (31.3)	39 (9.2)			
The mother's address is documented	Yes	405 (96.0)	417 (98.8)	2.8	6.72	0.010*
	No	17 (4.0)	5 (1.2)			
Laboratory results are documented	Yes	151 (35.8)	346 (82.0)	46.2	186.09	< 0.001*
	No	271 (64.2)	76 (18.0)			

*Statistically significant difference.

3.7. Assessment criteria for delivery monitoring and immediate postpartum period

As shown in Table 8, compliance with postpartum monitoring increased from 39.0% to 86.0% ($p < 0.001$). Similarly, documentation of perineal status and neonatal information improved from 49.0% to 87.2% ($p < 0.001$). Compliance rates related to documentation of the time and mode of placental delivery increased significantly ($p = 0.005$). However, the mode of delivery and time of birth showed 100.0% compliance during both study periods.

4. Discussion

This study assessed changes in partograph documentation compliance following the introduction of the free maternity care policy combined with an obstetric record audit mechanism conducted by a medical advisor in the Lemba HZ. Based on the quality standards of the French National Agency for Accreditation and Health Evaluation (Agence Nationale d'Accréditation et d'Évaluation en Santé, ANAES), the findings demonstrate an overall improvement in obstetric documentation, with the number of criteria reaching the 75% compliance threshold increasing from 23 to 31 out of the 34 assessed criteria. These findings suggest a favorable evolution of documentation practices in a context of strengthened healthcare regulation and financing mechanisms.

The formal quality of the partograph presentation represents an essential component of its clinical and medico-legal value, as it ensures traceability of healthcare providers involved, chronological recording of obstetric events, and continuity of care [15].

Table 4: Assessment criteria for fetal monitoring.

Variable	Category	Baseline n (%)	Post-intervention n (%)	Difference (percentage points)	χ^2	p-value
Fetal presentation is documented on the partograph	Yes	369 (87.4)	387 (91.7)	4.3	4.11	0.048*
	No	53 (12.6)	35 (8.3)			
Fetal position is documented on the partograph	Yes	201 (47.6)	243 (57.6)	10.0	8.38	0.004*
	No	221 (52.4)	179 (42.4)			
Level of presentation is graded	Yes	196 (46.4)	245 (58.1)	11.7	11.40	0.001*
	No	226 (53.6)	177 (41.9)			
Fetal heart rate is documented	Yes	383 (90.8)	404 (95.7)	4.9	8.30	0.004*
	No	39 (9.2)	18 (4.3)			

*Statistically significant difference.

Table 5: Assessment criteria for maternal monitoring.

Variable	Category	Baseline n (%)	Post-intervention n (%)	Difference (percentage points)	χ^2	p-value
Maternal behavior is documented on the partograph	Yes	415 (98.3)	419 (99.3)	0.9	1.62	0.203
	No	7 (1.7)	3 (0.7)			
Cervical assessment includes cervical effacement and cervical dilation	Yes	310 (73.5)	387 (91.7)	18.2	48.84	< 0.001*
	No	112 (26.5)	35 (8.3)			
The status of the amniotic sac is documented on the partograph	Yes	322 (76.3)	401 (95.0)	18.7	60.21	< 0.001*
	No	100 (23.7)	21 (5.0)			
Amniotic fluid characteristics are documented on the partograph	Yes	277 (65.6)	406 (96.2)	30.6	127.73	< 0.001*
	No	145 (34.4)	16 (3.8)			
Uterine contractions are documented on the partograph	Yes	347 (82.2)	406 (96.2)	14.0	42.88	< 0.001*
	No	75 (17.8)	16 (3.8)			
The following vital signs are documented: blood pressure, temperature, and maternal pulse	Yes	260 (61.6)	328 (77.7)	16.1	25.93	< 0.001*
	No	162 (38.4)	94 (22.3)			
Pelvic assessment is documented on the partograph	Yes	158 (37.4)	279 (66.1)	28.1	69.48	< 0.001*
	No	264 (62.6)	143 (33.9)			

*Statistically significant difference.

In this study, documentation of laboratory examinations showed one of the largest improvements, increasing from 36.0% to 82.0% ($p < 0.001$). This improvement may be related to strengthened documentary requirements associated with the validation process for reimbursed services, in which completeness of medical records represents an important compliance criterion. Although this indicator was not included in the original ANAES framework, it was incorporated into the locally adapted assessment tool to reflect specific documentation requirements of the Solidarity Health Fund contractual financing mechanism.

Identification of midwives also improved significantly, reaching 94.8% compared with 82.0% before the intervention ($p < 0.001$). This level of compliance exceeds findings reported in health centers in the Foumban district of Cameroon (52.9%) [17] and at

Table 6: Assessment criteria for therapeutic interventions.

Variable	Category	Baseline n (%)	Post-intervention n (%)	Difference (percentage points)	χ^2	p-value
The prescriber's identity is documented for each prescription	Yes	349 (82.7)	407 (96.4)	13.7	42.68	< 0.001*
	No	73 (17.3)	15 (3.6)			
Medication names are written in full	Yes	417 (98.8)	420 (99.5)	0.7	–	0.451
	No	5 (1.2)	2 (0.5)			
The route of administration for medications is documented	Yes	413 (97.9)	420 (99.5)	1.7	4.51	0.034*
	No	9 (2.1)	2 (0.5)			
Medication dosage is documented	Yes	410 (97.2)	417 (98.8)	1.7	2.94	0.086
	No	12 (2.8)	5 (1.2)			

*Statistically significant difference.

Table 7: Assessment criteria for procedures and event markers.

Variable	Category	Baseline n (%)	Post-intervention n (%)	Difference (percentage points)	χ^2	p-value
Urine analysis	Yes	31/46 (67.4)	27/27 (100.0)	32.6	5.41	< 0.001*
	No	15/46 (32.6)	0/27 (0.0)			
Rupture of membranes (spontaneous or artificial)	Yes	388 (91.9)	414 (98.1)	6.1	16.94	< 0.001*
	No	34 (8.1)	8 (1.9)			

*Statistically significant difference.

Table 8: Assessment criteria for delivery monitoring and the immediate postpartum period.

Variable	Category	Baseline n (%)	Post-intervention n (%)	Difference (percentage points)	χ^2	p-value
The mode of delivery is documented	Yes	422 (100.0)	422 (100.0)	0.0	–	–
	No	0 (0.0)	0 (0.0)			
The condition of the perineum is documented	Yes	208 (49.3)	368 (87.2)	37.9	140.00	< 0.001*
	No	214 (50.7)	54 (12.8)			
The date and time of delivery are documented	Yes	417 (98.8)	421 (99.8)	0.9	2.69	0.101
	No	5 (1.2)	1 (0.2)			
Newborn sex, birth weight, and Apgar score are documented	Yes	318 (75.4)	382 (90.5)	15.2	34.30	< 0.001*
	No	104 (24.6)	40 (9.5)			
The time and mode of placental delivery are documented	Yes	397 (94.1)	413 (97.9)	3.8	7.85	0.005*
	No	25 (5.9)	9 (2.1)			
Postpartum monitoring is documented and includes the following: uterine involution assessment, maternal pulse, blood pressure, temperature, and quantification of blood loss	Yes	165 (39.1)	363 (86.0)	46.9	198.00	< 0.001*
	No	257 (60.9)	59 (14.0)			

*Statistically significant difference.

Angers University Hospital in France (58.0%) [18]. These differences may reflect variations in service organization, institutional requirements for traceability, and supervision approaches implemented across different settings.

In the Lemba HZ, integrating documentary verification into the reimbursement process may have increased healthcare providers' attention to administrative components of the partograph. The introduction of compliance monitoring by the medical advisor encouraged providers to systematically complete the administrative section of the partograph upon admission of women in labor, corresponding to a cervical dilation threshold of 4 cm. This observation is consistent with the managerial principles underlying Performance-Based Financing (PBF). By linking reimbursement of Universal Health Coverage subsidies to technical and administrative validity of supporting documents, this mechanism creates a strong institutional incentive [19]. Consequently, the partograph moves beyond being perceived as a burdensome administrative requirement and becomes a critical medico-legal and financial tool for healthcare facility sustainability [20, 21].

Fetal monitoring parameters remained among the least documented criteria despite significant improvements. Documentation of fetal position increased from 48.0% to 57.6% ($p = 0.004$), while recording of the level of fetal presentation improved from 47.0% to 58.1% ($p = 0.001$). These compliance levels remain lower than those reported in other settings. Specifically, for the assessment of the level of presentation, higher rates were reported in the Foumban district in Cameroon (82.4%) [17], Farhat Hached University Hospital in Sousse, Tunisia (99.3%) [22], and Angers University Hospital in France (100.0%) [18]. Conversely, for the assessment of fetal position, a substantially lower rate was found in the Farhat Hached University Hospital (2.75%) [22], while Angers University Hospital approached the required threshold (74.0%) [18]. Insufficient documentation of these parameters may be explained by the complexity of their clinical assessment, which requires adequate mastery of vaginal examination techniques and correct interpretation of obstetric landmarks. Confusion between fetal presentation, position, and descent may also contribute to under-documentation [23]. These findings suggest that documentary control mechanisms, although associated with overall improvement, should be complemented by targeted clinical training interventions focusing on obstetric monitoring skills.

Assessment of maternal monitoring demonstrated substantial improvement for several criteria. Documentation of amniotic fluid characteristics increased from 66.0% to 96.2% ($p < 0.001$), reaching levels comparable to those reported at Farhat Hached University Hospital in Sousse (91.6%) [22] and Angers University Hospital (99.0%) [18], but higher than findings from the Foumban district in Cameroon (52.9%) [17]. These differences may reflect variations in obstetric practice organization and labor monitoring conditions across settings. Assessment of the obstetric pelvis also improved significantly, increasing from 37.0% to 66.1% ($p < 0.001$), although it remained below the 75% compliance threshold. As with other clinical parameters, this criterion requires specific technical competence and may be influenced by the subjective nature of clinical examination. Its inclusion in the locally adapted assessment framework responded to contextual requirements related to obstetric monitoring and service contracting mechanisms.

Criteria related to placental delivery and immediate postpartum care also demonstrated substantial improvement. Monitoring of women during the postpartum period, including vital signs, uterine tone assessment, and blood loss evaluation, increased from 39.0% to 86.0% ($p < 0.001$). This finding is comparable to that reported at Farhat Hached University Hospital in Sousse (85.9%) [22]. Documentation of perineal status also improved, increasing from 49.0% to 87.2% ($p < 0.001$). This level exceeds findings reported in several settings, including Angers University Hospital (13.0%) [18], Foumban district in Cameroon (27.3%) [17], and Sousse University Hospital (70.3%) [22]. These differences may result from the combined influence of several factors, including documentation requirements linked to healthcare financing, service organization, and intensity of supervision.

4.1. Strengths and limitations of the study

From a methodological standpoint, the main strength of this study lies in the application of the standardized reference framework from the French National Agency for Accreditation and Evaluation in Health (Agence Nationale d'Accréditation et d'Évaluation en Santé, ANAES). The protocol's strength is further reinforced by an exhaustive selection of maternity units at the second stage of sampling, combined with systematic probability sampling of partographs as statistical units at the third stage. From a health policy perspective, this study provides empirical evidence regarding the added value of health insurance medical advisors within the Universal Health Coverage (UHC) framework in the Democratic Republic of the Congo (DRC). Beyond budgetary oversight, these medical advisors emerge as pivotal actors in healthcare quality regulation. This prospective service audit model offers a foundational strategy to secure public funding while simultaneously raising clinical practice standards in a health system undergoing reconstruction.

Although this study provides compelling insights, interpreting its results requires acknowledging certain methodological limitations, which were nonetheless anticipated in the protocol design. First, an observation bias (the Hawthorne effect) may have accelerated improvements in partograph utilization, as healthcare staff were aware of being audited by the medical advisor. Nevertheless, this bias reflects the routine dynamics of Performance-Based Financing (PBF), where continuous institutional monitoring serves as the primary mechanism to sustain professional behavior change. Second, the non-probabilistic selection of the Lemba Health Zone limits the direct generalizability of these findings to all healthcare facilities across the city-province of Kinshasa. However, this single-site focus is offset by the rigor of the internal sampling design comprising an exhaustive selection of maternity units and a systematic random selection of partographs which ensures high internal validity for this pilot area. Another limitation stems from the multifactorial nature of partograph use, which depends closely on healthcare providers' workloads and training levels. Consequently, this study does not attempt to isolate the exclusive effect of the medical advisor; rather, it evaluates their role within a healthcare system undergoing transition toward UHC. Comparing partograph documentation quality before and after the advisor's intervention effectively captures the dynamics of this shifting clinical practice.

5. Conclusion

This study demonstrated a significant improvement in partograph documentation compliance following the introduction of the free maternity care policy combined with a medical advisor-led audit mechanism in the Lemba HZ. The observed improvements mainly concerned traceability of obstetric information, maternal and fetal monitoring, and documentation of clinical interventions. However, some technically complex clinical parameters remained insufficiently documented, highlighting the need to combine audit mechanisms with continuous capacity-building interventions for healthcare providers. Further studies are required to determine whether improvements in documentation quality translate into better maternal and neonatal outcomes.

Abbreviations

UHC	Universal Health Coverage
DRC	Democratic Republic of the Congo
ANAES	Agence Nationale d'Accréditation et d'Évaluation en Santé
USAID	United States Agency for International Development
AFROHUN	Africa One Health University Network
HZ	Health Zone

Data availability

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

Declaration of competing interest

The authors declare that they have no competing financial interests or personal relationships that could have influenced the work reported in this manuscript.

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