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Assessment of maternal health service readiness and availability in primary-level facilities in Nigeria: A Cross-sectional Study

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Abstract
Objective: This study aimed to assess maternal health service readiness and availability in primary-level facilities in Nigeria.
Methodology: A facility-based cross-sectional study was carried out in Jigawa, Lagos, and Oyo states in Nigeria. We included Kiyawa and Dutse LGAs in Jigawa state, Lagelu and Ibadan Southwest LGAs in Oyo State and Ikorodu LGA in Lagos State. In total, we included 43 PHCs and 13 TBAs across all 3 states. The WHO Service Availability and Readiness Assessment (SARA) form was used as the model for the data collection instrument.
Result: According to our data, there is a significant shortage of healthcare human resources across PHCs in the 3 states. Most PHCs and TBAs in the three states offer prenatal care services and prescribe iron supplements and folic acid. Additionally, most of the facilities lack essential equipment. Moreover, most TBAs in this study lack Infection, Prevention, and Control (IPC) materials, and they also do not offer intermittent preventive therapy (IPTp) for malaria and tetanus toxoids to their clients.
Conclusion: Following the WHO health system building blocks, to construct composite units across different domains, this study revealed that the Nigerian government must collaborate with all stakeholders to ensure provision of a minimum standard of care in terms of health infrastructure, human resources for health and service provision at all PHCs across the country.

Keywords: Maternal mortality, Primary Health Care, Accessibility, Availability, Affordability

Plain English Summary

We conducted this research to evaluate the assessment of maternal health service readiness and availability in primary-level facilities in Nigeria. The data collection tool we used was adapted from the WHO Service Availability and Readiness Assessment (SARA) form. Our study provides detailed and useful information for designing interventions to address preventable maternal deaths in Nigeria. These findings are relevant to improve commitment from Nigeria's federal government, state authorities and other partners, which is necessary to guarantee that the users receive the core ANC components.

Background

The burden of maternal mortality is a major global health concern (1). Many pregnant women in sub-Saharan Africa continue to die from preventable causes such as excessive bleeding during childbirth, infection, and obstructed labour (1). In 2020, the Maternal Mortality Rate (MMR) in Sub-Saharan Africa (SSA) was 430 per

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100,000 live births compared to 12 per 100,000 live births in high-income countries (1). SDG target 3.1 advocates decreasing the global MMR to less than 70 per 100,000 live births (2). Most SSA countries will not accomplish this target if the rate of decline of maternal deaths is not improved.

Undoubtedly, there is cause for serious concern regarding the maternal death rate in Nigeria, as it accounts for 10% of all pregnancy-related deaths worldwide (3), despite the country making up only 2.4% of the global population (4). Every year, Nigeria loses 512 women per 100,000 live births, and the country is not on track to meet the SDG target of 3.1 (1, 3). Maternal mortality has several causes, including poverty, cultural norms, lack of education, and poor access to high-quality healthcare (3, 5).

Compared to most developed countries, Nigerian women have a 500-fold higher risk of dying during childbirth (6). Many pregnant women in Nigeria do not receive proper care due to either insufficient resources in their areas or the high cost of treatments (3). Poor infrastructure, systemic failure, and limited access to quality healthcare services, particularly for rural residents, significantly influence maternal health in Nigeria and contribute to preventable maternal deaths (3). Previous attempts to reduce maternal deaths in Nigeria have included expanding access to pregnancy care and enhancing Primary Health Care accessibility, availability, affordability, and care quality, which are likely to lower the country's high rate of neonatal and maternal mortality (7, 8). However, these measures have not been sufficient to guarantee a significant reduction in maternal deaths in Nigeria.

Primary health care is considered the bedrock of the Nigerian health system. Yet, infrastructural deficits and a low healthcare workforce have hampered its functionality (9). Traditional birth attendants (TBA) are important maternal health service delivery stakeholders. According to Ntoimo *et al.* (2022), twenty per cent of pregnant mothers delivered at a TBA facility (10). While the government and development partners have implemented several interventions to reduce preventable maternal deaths (11, 12, 13), assessing service readiness and availability remains crucial for identifying gaps and planning future interventions. This study, therefore, aimed to assess maternal health service readiness and availability in primary-level facilities in Nigeria. The findings from this study will be useful in designing interventions to address preventable maternal deaths in Nigeria. This is crucial because earlier research conducted in Nigeria has shown that many pregnant mothers currently do not receive the proper care they need because of inadequate systems, inadequate infrastructure, and restricted access to high-quality healthcare services, especially for rural residents. These factors negatively impact maternal health in Nigeria, which often contributes to avoidable maternal deaths (14, 15, 16).

Materials and methods

Study Design

We conducted a facility-based cross-sectional study to assess maternal health service readiness and availability in primary care facilities.

Study Area

This study was conducted across three Nigerian states: Jigawa, Lagos, and Oyo. Specific Local Government Areas (LGAs) were purposefully selected within each state. In Jigawa State, these included Kiyawa (rural) and Dutse (urban) LGAs. In Oyo State, we included Lagelu (peri-urban) and Ibadan Southwest (urban) LGAs. Lastly, Ikorodu (peri-urban) LGA was included in Lagos State.

Jigawa State, located in the Northwestern region, is predominantly inhabited by the Hausa and Fulani people, who are mostly Muslim, and the economy is largely dependent on agriculture. The maternal mortality rate in this region is alarmingly high at 1,362 per 100,000 live births (17). Conversely, Lagos and Oyo States, located in the Southwest zone, are predominantly occupied by the Yoruba people, with Christianity and Islam being the predominant religions. Lagos and Oyo States also have lower MMRs (555 and 489 per 100,000 live births, respectively) (18, 19, 20). Lagos State has the highest population density in Nigeria, with more than 9 million people living there, while Oyo and Jigawa states have populations of 5.5 million and 4.3 million, respectively (21).

Kiyawa LGA has a population of approximately 230,000 people, with an estimated 25% being children under five years old (22). The healthcare landscape in Kiyawa LGA comprises 33 government-operated facilities, including primary health centres (PHCs), basic health centres, and health posts. Additionally, there are private primary healthcare facilities and Patent and Proprietary Medicine Vendors (PPMVs), although referral services are primarily accessed in neighbouring LGAs such as Dutse and Hadeija (22). Meanwhile, Dutse LGA has approximately 202,448 inhabitants who engage in diverse occupations such as farming, trading, fishing, and civil service (22). There are 41 primary healthcare facilities, one government tertiary facility, one general hospital, and one private

secondary hospital that serves as a referral centre (23).
Ibadan Southwest LGA is classified as urban, with its headquarters at Oluyole Estate within the bustling Ibadan metropolis. This area is characterised by manufacturing and processing factories, indicative of its industrial activity (24). Ibadan South-west LGA boasts 43 healthcare facilities, including 22 Primary Health Centres (PHCs) and 21 secondary hospitals (16 private and 5 public) (25). In contrast, Lagelu LGA is one of the six peri-urban LGAs in Ibadan and comprises more than 1,076 towns and villages (26, 27), and the predominant economic activities in Lagelu LGA revolve around agriculture, notably palm oil and black soap production (26). There are 3 secondary facilities and 7 primary healthcare facilities in Lagelu LGA (26).
Ikorodu LGA is a peri-urban area (28), with an estimated population of over 1 million and an annual growth rate of 5.3% (29, 30). There are 2 general hospitals and 32 government primary health facilities in Ikorodu LGA (31). The predominant economic activities of the residents include trading, farming, and manufacturing industries (28).

Sampling
We purposely selected 1-2 LGAs in each state to ensure the feasibility of data collection. Within these LGAs, we identified primary health facilities and traditional birth attendants that offer maternal health services, including antenatal and delivery care. Specifically, we included 19 PHCs in Jigawa State since there are no independent TBAs, 8 PHCs and 3 TBAs in Lagos State, and 16 PHCs and 10 TBAs in Oyo State.

Data collection
We trained a team of 2 data collectors in each state. The data collectors, who are all nurses, visited the selected facilities for assessment. The assessment was done in pairs to facilitate data entry into the data collection tool (Kobo Collect) and ensure the completeness of data. Respondents were mid-level to senior-level facility staff. The data collection tool was adapted from the WHO Service Availability and Readiness Assessment (SARA) form (7).
The survey tool has seven sections (a section on facility identification and Antenatal/delivery care services records, and 6 different domains) summarised as follows:

1. The first section contains questions identifying the facility, other details such as the availability of ANC and delivery register, and the cost of ANC.
2. The second section includes questions related to the health workforce, such as the availability of health service professionals.
3. The third section has questions about service readiness regarding the availability of essential equipment.
4. The fourth section covers questions on materials for infection prevention and control.
5. The fifth section explores service availability in terms of basic obstetric and newborn care, newborn signal functions, and routine perinatal practices.
6. The sixth section pertains to service readiness regarding essential medicines and commodities.
7. The seventh section focuses on infrastructure, including the availability of inpatient/observation beds and power supply

Data Management and Analysis
The data was compiled, sorted, cleaned, and analysed using STATA version 18. Descriptive statistics such as frequency distribution, percentages, median, and range were used to summarise the data. Categorical variables were summarised as proportions, while continuous variables were summarised as the mean, median, and range.
There are six domains, each weighing 20 units. The capacity score will be calculated across different domains, composite units will be calculated for each domain, and it will be graphically represented using a component bar chart.
The composite unit for the different domains was calculated using the formula below.

$$Composite\ unit = \frac{\text{Aggregate of all variables in each domain}}{Product\ of\ numbers\ of\ facilities\ and\ numbers\ of\ variables\ in\ each\ domain} x$$

weight (20 units)

Results

Service availability at the facilities
ANC clinics are held more frequently per week in Jigawa state. Monthly ANC attendance and number of facility deliveries were also higher in Jigawa state PHCs. Vaginal delivery was free at most PHCs, but the median cost of delivery with TBA was ₦10,000 and ₦25,000 in Oyo and Lagos states respectively (Table 1).

Table 1: Health workforce and services available at the facilities (Median (Range))

Variables	Jigawa n = 19	Lagos n = 11		Oyo n = 26	
	PHC n = 19 n (%)	PHC n = 8 n (%)	TBAs n = 3 n (%)	PHC n = 16 n (%)	TBAs n = 10 n (%)
Location					
Peri-urban/rural	10 (52.6)	0 (0.0)	0 (0.0)	7 (43.7)	2 (20.0)
Urban	9 (47.4)	8 (100)	3 (100)	9 (56.3)	8 (80.0)
Antenatal/delivery care services records					
Delivery registers available	18 (94.7)	6 (75.0)	3 (100)	16 (100)	4 (40.0)
National /HMIS delivery register	19 (95.0)	6 (75.0)	0 (0.0)	16 (100)	0 (0.0)
ANC clinics per week Median (range)	2 (1-3)	1 (1-2)	1 (1-1)	1 (1-2)	1 (1-1)
ANC attendance median (range)	198 (54-2121)	126 (27-201)	21 (12-30)	45 (4-110)	5 (0-9)
Number of births median (range)	40 (5-164)	13 (0-17)	5 (3-8)	7 (0-14)	2 (2-3)
Cost of ANC registration/booking (₦) median (range)	1000 (0 – 3500)	0 (0 – 2000)	2500 (2500 – 3000)	0 (0 – 1000)	1000 (0 – 5000)
Cost of ANC visit median (range)	400 (0 – 800)	0 (0 – 500	500 (500 – 600)	0 (0 – 200)	200 (0 – 500)
Cost of vaginal delivery. median (range)	500 (0 – 3000)	0 (0 – 0)	25000 (20000- 25000)	0 (0 – 0)	10000 (0 – 25000)

Availability of the health workforce at the facilities
Generally, we found a shortage of the health workforce across the three states. Facilities in Jigawa and Oyo states did not have Medical Doctors, and Oyo state had the lowest average number of Midwives/Nurses. CHEWs and CHOs were the most common healthcare cadre available at facilities across the 3 states, with a median of 5, 5 and 3 reported for Jigawa, Lagos and Oyo states, respectively (Table 2).

Table 2: Availability of health workforce at the facilities (Median (Range))

Personnel	Jigawa N=19	Lagos N=11		Oyo N=26	
	PHC n=19	PHC n=8	TBAs n=3	PHC n=16	TBAs n=10
Personnel					
Medical doctor	0 (0 - 0)	3 (0 – 9)	0 (0 – 0)	0 (0 – 1)	0 (0 – 0)
Midwives /Nurses	3 (1 - 6)	5 (0 - 9)	0 (0 - 0)	1 (0 - 3)	0 (0 - 0)
CHEWs & CHOs	5 (3 - 9)	5 (3 – 6)	0 (0 – 2)	3 (2 – 6)	0 (0 – 0)
Health Assistant	2 (0 – 15)	4 (1 – 6)	0 (0 – 2)	2 (0 – 6)	0 (0 – 9)
Auxiliary nurse	0 (0 – 2)	0 (0 – 6)	0 (0 – 6)	0 (0 – 6)	0 (0 – 0)
Cleaners	3 (1 – 6)	1 (0 – 6)	0 (0 – 1)	0 (0 – 2)	0 (0 – 1)

Essential equipment and infection prevention and control materials are available at the facilities
Most of the facilities lack adequate essential equipment. Availability of child and infant weighing scales was poor in Jigawa PHCs and among TBAs in Lagos and Oyo states. No TBAs in Lagos state had functional thermometers, intravenous infusion stands, or oxygen cylinders. Similarly, in Oyo state, no TBAs had functional Ambu bags, oxygen concentrators, and oxygen cylinders, and only 1 TBA (10.0%) had a functional intravenous infusion stand. Overall, more facilities in Oyo 14 (87.5%) had functional blood pressure apparatuses compared to only 5 (62.5%) PHCs in Lagos, and 1 (5.3%) PHC in Jigawa state (Table 3).

Table 3: Essential equipment and infection prevention and control materials available at the facilities

Observed items (functional and can be used for patient care)	Jigawa N=19	Lagos N=11		Oyo N=26	
	PHC n=19	PHC n=8	TBAs n=3	PHC n=16	TBAs n=10
	n (%)	n (%)	n (%)	n (%)	n (%)
Adult weighing scale	1 (5.3)	5 (62.5)	0 (0.0)	8 (50.0)	8 (80.0)
Child weighing scale- 250-gram gradation	1 (5.3)	4 (50.0)	1 (33.3)	4 (25.0)	2 (20.0)
Infant weighing scale – 100-gram gradation	0 (0.0)	2 (25.0)	0 (0.0)	8 (50.0)	1 (10.0)
Thermometer	3 (15.8)	4 (50.0)	0 (0.0)	15 (93.8)	1 (10)
Stethoscope	1 (5.3)	2 (25.0)	1 (33.3)	16 (100)	3 (30.0)
Blood pressure apparatus	1 (5.3)	5 (62.5)	1 (33.3)	14 (87.5)	6 (60.0)
Light source (flashlight acceptable)	1 (5.3)	4 (50.0)	1 (33.3)	4 (25.0)	0 (0.0)
Intravenous infusion stand	1 (5.3)	4 (50.0)	0 (0.0)	9 (56.3)	1 (10.0)
Oxygen concentrators	0 (0.0)	2 (25.0)	0 (0.0)	1 (3.8)	0 (0.0)
Oxygen cylinders	0 (0.0)	2 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)
Ambu bags for resuscitation	2 (10.5)	4 (50.0)	0 (0.0)	7 (43.8)	0 (0.0)
Non-electric pot with cover for boiling/steaming	5 (26.3)	2 (25.0)	1 (33.3)	7 (43.8)	2 (20.0)

Materials for Infection Prevention and Control Facilities

Most facilities have access to supplies for infection prevention and control. However, facilities in Oyo state had the least supplies compared to Jigawa and Lagos states. Handwashing SOP was reported in 89.5% of Jigawa facilities, 87.5% of Lagos facilities and just 25.0% of facilities in Oyo state. Similarly, only 62.5% of facilities in Oyo reported having disposable latex gloves compared to Jigawa (89.5%) and Lagos (87.5%). Guidelines for standard precautions and control were reported in 63.2% of PHCs in Jigawa, 75.0% of PHCs in Lagos and only 37.5% of PHCs in Oyo state. Very few TBAs (Lagos 0.0%, Oyo 10%) had guidelines on standard precautions for infection prevention (Table 4).

Table 4: Materials for Infection Prevention and Control available at facilities

Observed items	Jigawa N=19	Lagos N=11		Oyo N=26	
	PHC n=19 n (%)	PHC n=8 n (%)	TBAs n=3 n (%)	PHC n =16 n (%)	TBAs n=10 n (%)
Clean running water	13(68.4)	6(75.0)	3(100.0)	9(56.3)	0(0.0)
Handwashing soap	17(89.5)	7(87.5)	3(100)	4(25.0)	2(20.0)
Alcohol-based hand rub	14(73.7)	7(87.5	3(100.0)	4(25.0)	2(20.0)
Disposable latex gloves	17(89.5)	7(87.5)	3(100)	10(62.5)	5(50.0)
Waste receptacle	13(68.4)	5(62.5)	0(0.0)	12(75.0)	1(10.0)
Sharps container	19(100)	8(100.0)	0(0.0)	15(93.8)	0(0.0)
Environmental disinfectant	11(57.9)	6(75.0)	3(100.0)	13(81.3)	5(50.0)
Disposable syringes with disposable needles	19(100)	7(87.5)	0(0.0)	13(81.3)	0(0.0)
Auto-disable syringe	10(52.6)	7(87.5)	0(0.0)	13(81.3)	00(0.0)
Guidelines on standard precautions for infection prevention	12(63.2)	6(75.0)	0(0.0)	6(37.5)	1(10.0)

Service availability at facilities

Most PHCs and TBAs across the three states provide antenatal care services and prescribe iron supplementation, folic acid, and intermittent preventive treatment (IPTp) for tetanus toxoid and malaria (Table 5).

Table 5: Service availability at facilities

	Jigawa n = 19	Lagos n = 11		Oyo n = 26	
	PHC n = 19	PHC n = 8	TBAs n = 3	PHC n = 16	TBAs n = 10
	n (%)	n (%)	n (%)	n (%)	n (%)
Antenatal care services	18 (94.7)	8 (100)	3 (100.0)	15 (93.8)	10 (100.0)
Iron supplementation prescribed	19 (100.0)	8 (100)	1 (33.3)	16 (100.0)	8 (80.0)
Folic acid supplementation is prescribed.	18 (94.7)	6 (75.0)	1 (33.3)	16 (100.0)	8 (80.0)
Intermittent Preventive Treatment in pregnancy (IPTp) for malaria is prescribed	18 (94.7)	6 (75.0)	0 (0.0)	16 (100.0)	5 (50.0)
Tetanus toxoid vaccination is prescribed	18 (94.7)	6 (75.0)	2 (66.7)	16 (100.0)	4 (40.0)
Guidelines on ANC	10 (52.6)	7 (87.5)	1 (33.3)	7 (43.8)	1 (10.0)
Availability of Partograph	16 (84.2)	7 (87.5	0 (0.0)	9 (56.3)	0 (0.0)
24-hour service delivery	16 (84.2)	4 (50.0)	3 (100.0)	12 (75.0)	10 (100.0)

Medicines and Commodities available at the facilities

Our findings indicate that the distributions of prescribed medications and other commodities vary across the three states' PHCs and TBAs. Although all the PHC facilities (100.0%) included in this study had iron tablets and folic acid tablets, only very few had injectable antibiotics or antibiotic eye ointment for newborns. Similarly, TBAs generally lacked medicines and commodities (Table 6).

Table 6: Medicines and Commodities available at the facilities

	Jigawa n = 19	Lagos n = 11		Oyo n = 26	
	PHC n = 19	PHC n = 8	TBAs n = 3	PHC n = 16	TBAs n = 10
	n (%)	n (%)	n (%)	n (%)	n (%)
Iron tablets	19(100.0)	8(100)	0(0.0)	16(100.0)	3(30.0)
Folic acid tablets	19(100.0)	8(100)	0(0.0)	16(100)	3(30.0)
Tetanus toxoid vaccine	18(94.7)	6(75.0)	2(66.7)	16(100)	2(20.0)
IPT drug	17(89.5)	7(87.5)	0(0.0)	16(100)	3(30.0)
Insecticide-Treated Net	3(15.8)	3(37.5)	0(0.0)	12(75.0)	3(30.0)
Antibiotic eye ointment for newborns	2(10.5)	3(37.5)	0(0.0)	5(31.3)	0(0.0)
Injectable uterotonic (e.g. oxytocin	18(94.7)	6(75.0)	0(0.0)	9(56.3)	0(0.0)
Injectable antibiotic	9(47.4)	6(75.0)	0(0.0)	8(50.0)	0(0.0)
Magnesium sulfate (injectable)	11(57.9)	4(50.0)	0(0.0)	6(37.5)	0(0.0)
Skin disinfectant	8(42.1)	5(62.5)	1(33.3)	8(50.0)	2(20.0)
Intravenous solution with an infusion set	19(100.0)	5(62.5)	0(0.0)	4(25.0)	0(0.0)

Infrastructures available at the facilities

Most PHCs and TBAs in the three states did not have enough provision of beds, most especially beds for newborns (Table 7). Oyo state had the lowest average (5) bed supply across the 3 states, while the average newborn bed in Jigawa and Oyo states was reported as 0 (Table 7).

Table 7: Infrastructures available at the facilities. Median [Range]

	Jigawa n = 19	Lagos n = 11		Oyo n = 26	
	PHC n = 19	PHC n = 8	TBAs n = 3	PHC n = 16	TBAs n = 10
Beds in the facilities	10[4 - 22]	7[4 - 14]	4[3 - 6]	5[2-9]	3[2 - 8]
Newborns	0[0-2]	1[0-3]	0[0-1]	0[0-1]	1[0-4]
Power supply (electricity grid, generator, solar)	19(100.0)	8(100.0)	3(100.0)	13(81.3)	7(70.0)

Composite scores across different domains of the health facilities

The figure shows composite units across different domains following the WHO health system building blocks. According to the WHO framework, the graph shows composite units spanning several domains (World Health Organisation, 2010). Even though Lagos PHCs had the highest workforce, and Oyo PHCs reported higher scores for equipment, health workforce, and equipment scores were generally low across all states. Among the PHCs, medicines and commodities scores were above average, but service availability was the lowest in Oyo state. Among the TBAs, infrastructure scores were higher in Lagos, but service availability scores were higher in Oyo. Lagos TBAs had higher infrastructure scores than all other facilities studied (Figure 1).

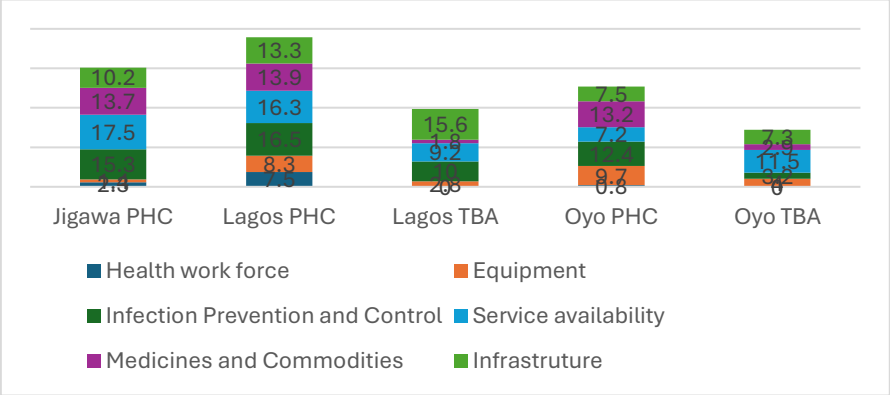

Figure 1: Composite scores across different domains of the health facilities

Discussion

In this study, we evaluated the readiness and availability of maternal health services at primary healthcare facilities and traditional birth attendants in three Nigerian states: Jigawa, Lagos, and Oyo. Our findings indicate a significant shortage of healthcare personnel, particularly medical doctors, across all three states, alongside notable regional variations in the types of healthcare workers available at primary healthcare centres. Additionally, we observed that antenatal care (ANC) clinics are conducted more frequently in Jigawa State, which also reports higher monthly ANC attendance and greater hospital deliveries than in Lagos and Oyo. While most PHCs and TBAs in our study provide prescriptions for iron supplementation, folic acid, and intermittent preventive treatment for tetanus toxoid and malaria, many TBAs lack essential medications and supplies. Overall, both PHCs and TBAs demonstrate inadequate access to essential medical equipment necessary for effective maternal healthcare delivery.

The result of our analysis shows that Jigawa state has higher ANC registration, attendance, and number of facility deliveries compared to Lagos and Oyo states. These regional disparities are likely influenced by factors such as fertility rate, availability of alternative options, and cultural nuances (32). Jigawa, which is predominantly rural and with fewer women in the formal workforce, may afford women more flexibility to attend ANC appointments. Additionally, rural communities often benefit from targeted health interventions that promote ANC attendance through awareness campaigns and mobile health units. Conversely, Lagos and Oyo, being more urban, have a wider array of private healthcare options, which may influence women's healthcare choices, whereas the higher poverty levels in Jigawa will likely lead more residents to seek care at government hospitals, which are generally more affordable (33). The high number of Southern Nigerian women in the formal workforce may contribute significantly to lower ANC attendance rates due to demanding schedules (34). To address these challenges, the government should prioritise awareness campaigns and consider implementing flexible ANC schedules, such as weekend appointments, in both urban and rural areas. By investing in these initiatives, we can ensure that all women, regardless of their location or economic level, have equitable access to essential maternal healthcare services.

Our findings, consistent with previous studies (35, 36), indicating an equitable distribution and significant shortage of healthcare staff across all three states. PHCs in Jigawa and Oyo states had no Doctors, and a range of 0-9 for midwives/Nurses in Lagos and Oyo states shows that some facilities also do not have at least a single midwife/Nurse. This report contrasts the National Primary Health Care Development Agency (NPHCDA) provision on the minimum standard of staffing for PHCs (37). This inequitable distribution of health workers directly

contributes to disparities in health outcomes in Nigeria (38). Aluko and Marie (2019) found that staff shortages ultimately reduce the hospital's readiness to respond to patient needs, emergency cases, and other health system demands (39). The implication for this is an increased workload for existing staff, leading to longer waiting times for patients, reduced quality of care when the available staff experience burnout, and the inability of the hospital to respond to public health crises such as the pandemic (40, 41, 42). The imbalance between workload and remuneration exacerbates the crisis, leading to the exodus of highly qualified health professionals. The migration of Nigerian medical professionals to developed countries is driven by factors such as better working conditions, financial opportunities, and professional growth (38).

Our investigation uncovered a critical lack of essential infrastructure, equipment, and infection prevention and control materials in most healthcare facilities, severely hindering the delivery of quality patient care and effective operation of the facility. Previous studies with similar findings about the lack of medical equipment in Nigerian PHCs include (43, 44). The absence of vital resources, such as oxygen concentrators, weighing scales, gloves, handwashing soaps, and sanitisers, compromises the ability to reduce infection transmission risks between patients and healthcare providers and limits the quality of care for newborns and their mothers. Without basic diagnostic and therapeutic tools, healthcare providers may struggle to assess patients correctly, leading to misdiagnoses, and inappropriate treatment of illnesses and management of deliveries (45). In addition, the hospital will struggle to respond to emergency cases, which may ultimately lead to complications, death of the mother or child, and loss of trust in the healthcare system, making women opt for alternative care (46). Furthermore, not all the hospitals in our study provide 24-hour service. All of these may explain the reason why, despite a very low average cost of vaginal delivery in government hospitals, some women still patronize TBA. To address these challenges, the government must invest in upgrading primary healthcare centres (PHCs), ensuring 24-hour service availability, and providing adequate staffing and essential medical equipment. This will not only improve access to quality care but also reduce the reliance on traditional birth attendants, ultimately enhancing maternal and child health outcomes.

We also found that while some TBAs have infrastructures and see patients based on their reported ANC attendance and number of deliveries, many lack human resources for health and IPC materials, thus exposing themselves to infections. Additionally, IPT for malaria and tetanus are not frequently done, thus exposing them to an increasing health risk to both the mother and the foetus. The lack of these preventive measures can lead to higher maternal and neonatal mortality, as well as longer-term health implications for infants who survive these risks. Hence, the need for government oversight of TBAs.

Conclusion

Nigeria's maternal healthcare system faces significant challenges influenced by factors at the individual, family, community, organisational, and governmental levels. Primary healthcare centres (PHCs) often lack the necessary readiness to provide adequate maternal care. To achieve the Sustainable Development Goals (SDGs) for maternal and child health, increased commitment from all stakeholders is imperative. The government must collaborate with all stakeholders to address the critical shortage of healthcare professionals by increasing staffing levels, investing in infrastructure, and improving working conditions. By implementing these comprehensive measures, Nigeria can enhance the availability and effectiveness of maternal healthcare services, ensuring the well-being of mothers and children nationwide.

List of Abbreviations

MMR: Maternal Mortality Rate
PHC: Primary Health Centres
WHO: World Health Organisation
SDGs: Sustainable Development Goals
ANC: Antenatal care
TBA: Traditional Birth Attendants
SARA: Service Availability and Readiness Assessment (SARA) form
NPHCDA: National Primary Health Care Development Agency

Declaration

Ethics approval and consent to participate

Before the commencement of the study, approvals were sought and obtained from the UI/UCH Ethics Committee in Oyo state (Ref. No NHREC/05/01/2008a), Jigawa State Ministry of Health (Ref. No. JGHREC/2023/152 and Lagos State University Teaching Hospital Ethics Committee (REG. NO. NHREC04/04/2008).

Consent for publication

Not applicable

Availability of data and material

The datasets used in this study are available from the corresponding request.

Competing interests
All authors declare that they have no conflicts of interest.

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Authors' contributions
AAB, OEO, DB, JA, and JS conceived and designed the study. OEO and BAA were responsible for data analysis. All authors were involved in the first draft of the manuscript. All authors were responsible for the intellectual content of the manuscript and the authors approved of the final draft of the manuscript.

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