

Provision of Maternal Health Services and Health-Facility Readiness in Benue State, Nigeria: A Facility-Based Assessment

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Abstract

Background: Adequate provision of maternal health services (MHS) is central to reducing the high burden of maternal mortality in sub-Saharan Africa, where Nigeria alone accounts for a disproportionate share of global maternal deaths. Yet the availability and readiness of facilities that deliver antenatal, delivery and postnatal care remain inconsistently documented at the sub-national level. This study assessed the extent of MHS provision and the readiness of primary and secondary health facilities in Benue State, north-central Nigeria.

Methods: A descriptive survey design was employed. Using a multistage sampling procedure across the three senatorial zones of Benue State, 400 women of reproductive age (15–49 years) and health workers were surveyed with a validated structured questionnaire (Cronbach's $\alpha = 0.83$), while seven primary and secondary facilities were assessed with a structured observational checklist covering physical structure, equipment, essential drugs, personnel and services. Data were analysed with descriptive statistics (mean $\pm$ standard deviation against a 2.50 criterion) and the chi-square test at $p < 0.05$.

Results: Antenatal ($\bar{x} = 2.51$) and postnatal ($\bar{x} = 2.62$) care were provided to a high extent, whereas delivery care provision was low ($\bar{x} = 2.21$). Facility assessment showed that most structures were rated good or adequate against national standards; core equipment, drugs and personnel were largely available though frequently insufficient, with notable gaps in vaginal specula, privacy screens, family-planning and inpatient services. Provision differed significantly across the three geographical zones ($\chi^2 = 87.346$; $df = 4$; $p < 0.05$).

Conclusion: Provision of maternal health services in Benue State is uneven, with a critical weakness in facility-based delivery care and pronounced zonal disparities. Strengthening delivery infrastructure, equitable resource distribution and continued investment in rural facilities are required to translate available antenatal and postnatal services into safer childbirth.

Keywords: *maternal health services; provision; health-facility readiness; delivery care; antenatal care; Nigeria*

1. Introduction

Health is a human right and a prerequisite for sustainable national development and one of the most urgent issues of the global health community is the health of mothers. Maternal health is defined by the World Health Organization as not only the absence of disease or infirmity but also a state of complete physical, mental and social well-being in all matters relating to the reproductive system and childbearing (WHO, 2017). Reducing maternal mortality and morbidity has thus been a major focus of international public health, encapsulated in Sustainable Development Goal 3, which aims for a maternal mortality ratio of less than 70 per 100,000 live births by 2030.

This is a pressing agenda in sub-Saharan Africa, where the maternal death rate is 525 per 100,000 live births and almost all preventable maternal deaths take place (WHO, 2022). Nigeria disproportionately bears this burden, accounting for an estimated 40,000 maternal deaths each year, and a life-time risk of maternal death of about 1 in every 13 women (WHO, 2020). It is generally acknowledged that adequate and organized maternal health services (MHS) are the most direct way of reversing this trend.

Maternal health services are the aspects of health care that are directed at protecting, promoting and preserving the health and well-being of mothers and their unborn children (Igbokwe & Isabu, 2023; Okpala, Okoye, Adeyemo & Iheanacho, 2019). They are a set of three intermeshed parts. Antenatal (prenatal) care involves the routine clinical and nursing care recommended during pregnancy including blood and urine investigations, tetanus toxoid and anti-malarial prophylaxis, nutritional counselling, supplementation and health education on danger signs in order to identify and follow up at risk women. Delivery (intrapartum) care is defined as skilled attendance at delivery in a clean, well-equipped space that has the ability to handle obstetric emergencies. Postnatal care (also known as postpartum care) is defined as the care provided to the mother and child in the days and weeks following birth, such as breastfeeding support, care of the umbilical cord, immunisation and screening for postpartum complications (WHO, 2018).

The provision of these services is the process of bringing together resources—financial, human, equipment and medicines—to make maternal health interventions possible (WHO, 2016). The successive Nigerian government has been aiming at this through a series of policy instruments and programmes such as increasing primary health care in rural areas and a series of national reproductive-health and safe motherhood policies. The provision of such services is expected to in turn to increase their use. But having a policy framework does not necessarily imply that facilities on the ground are set up, staffed and organised to provide the full range of maternal services, and the quality of the services provided is highly variable.

Although maternal mortality is a desired target to be reduced, the services offered to mothers in Nigeria remain poor, and local data remains inadequate for evidence-based policy and programme design. Although the attendance of women at ANC's is recorded, little is known about the facilities that are supposed to translate this attendance into safe delivery and postpartum outcomes, especially at the sub-national level and in a predominantly rural, agrarian state like Benue. This study fills this gap by examining the reported level of MHS provision and the observed readiness of the facilities providing MHS.

1.1 Objectives of the study

The study set out to assess the provision of maternal health services and facility readiness in Benue State, Nigeria. Specifically, it examined: (i) the extent to which antenatal care services are provided; (ii) the extent to which delivery care services are provided; (iii) the extent to which postnatal care services are provided; and (iv) the readiness of the health facilities—their physical structure, equipment, essential drugs and consumables, personnel and available services—for delivering maternal health care.

The following null hypothesis was tested at the 0.05 significance level: H_0 : The level of maternal health service provision does not differ significantly across the three geographical zones of Benue State.

2. Theoretical Framework and Related Literature

This study is based on the theory of quality of care put forward by Donabedian (1980) that structures, processes and outcomes are three inter-related elements of health-care delivery. Structure refers to the setting where care is offered – the physical and human resources, and the

leadership and safety culture of the facility. Process refers to the specific provision of care, the interventions and services provided to the patient. Outcome refers to what impact that care had on the patient's health. The model is one in which these dimensions are interdependent: good processes can be developed in a sound structure, which lead to better outcomes. The theory, when applied to the field of maternal health, suggests that the most likely place for a substantial decrease in maternal and newborn mortality will be where quality services are provided in well-resourced facilities, and offers a natural way of looking at the study that compares reported service provision (process) with an inventory of facility readiness (structure).

The empirical research from similar contexts highlights the need to investigate the provision side. The content of the antenatal care provided in secondary facilities in Nigeria was found to be lacking as reported by Osungbade, Oginni and Olumide (2020) which has implications for the quality of the care provided to mothers. Poor quality of delivery care, distribution inequities of health centres and stock-outs of essential supplies have been reported as recurrent constraints to facility-based childbirth in Nigeria and elsewhere in sub-Saharan Africa (Sadiq, Singh, Lakhera & Henry, 2017; Sanni, 2020). Similarly, Cross River, Osun and Ondo states have been reviewed for facility distribution and characteristics of health services and spatial disparities in maternal services have been reported (Ibor&Atomode, 2020; Sanni, 2020). In the context of this background, a multi-modal evaluation of reported provision and observed readiness can provide a more comprehensive picture of the maternal-care environment than can either approach alone.

3. Methods

3.1 Study design and setting

A descriptive survey design was adopted because it permits the systematic collection of data describing the present state of the phenomenon under investigation and supports generalisation from a sample to the wider population. The study was conducted in Benue State, in Nigeria's north-central (Middle Belt) region. Situated between latitudes 6.5° and 8.5° North and longitudes 7.47° and 10° East, the state comprises twenty-three local government areas over an area of about 33,955 square kilometres, with a predominantly rural, agrarian population. As of December 2022, the state's health directory listed 1,408 health institutions, of which 888 (63.1%) were public and 520 (36.9%) private (Benue State Hospital Management Board, 2023).

3.2 Population, sample and sampling

The study population comprised 566,029 persons - 563,005 women of childbearing age (15–49 years) attending antenatal and postnatal clinics at selected public facilities, and 3,024 registered health professionals providing maternal health services in the state (Benue State Hospital Management Board, 2023). The sample size was determined using Taro Yamane's (1967) formula at a 0.05 level of significance, yielding 400 respondents.

A multistage sampling procedure was used. First, the state was stratified into its three senatorial (geographical) zones. Second, two local government areas were selected from each zone by simple random (hat-draw) sampling, giving Katsina-Ala and Vandeikya (Zone A), Gboko and Makurdi (Zone B), and Ogbadibo and Otukpo (Zone C). Third, six primary and one secondary health facility were selected within these areas using a mix of random and purposive techniques. Fourth, women attending antenatal and postnatal clinics were sampled conveniently, and 72 registered health workers were selected by simple random sampling for the facility component.

3.3 Instruments

Two instruments were used. The first, the “Maternal Health Provision, Utilization and Enhancement Strategies in Benue State” (MHPUESBS) questionnaire, was a researcher-developed structured instrument of 46 items across six sections; the sections relevant to the present analysis captured the extent of antenatal, delivery and postnatal care provision on a four-point Likert scale (Very High Extent = 4 to Very Low Extent = 1), with a decision benchmark of 2.50. The second, an “Observational Checklist on the Maternal Health Services provided to the Clients” (OCMHSC), assessed facility readiness across physical structure, minimum equipment package, essential drugs and consumables, personnel and services, scored on a modified two-point scale.

3.4 Validity and reliability

Face and content validity of the questionnaire were established by four experts in health education, nursing, medicine and maternal health, whose feedback was incorporated into the final instrument. Internal consistency was assessed in a pilot of thirty women of childbearing age in Gwer-West LGA, who shared the characteristics of the study sample but were excluded from

it. The Cronbach's alpha reliability coefficient was 0.83, indicating that the instrument was reliable.

3.5 Data collection and analysis

Four hundred copies of the questionnaire were administered at the selected clinics on designated clinic days, with the assistance of the matrons of the respective facilities, and all 400 copies (100%) were retrieved. Facility readiness was assessed through direct observation and interviews with maternal health workers in the seven facilities. Data were entered into a spreadsheet and analysed using SPSS version 21. Socio-demographic characteristics were summarised with frequencies and percentages; research questions were answered using mean $\pm$ standard deviation, with an item or aggregate mean of 2.50 or above indicating a high extent of provision. The null hypothesis was tested using the chi-square test at $p < 0.05$.

3.6 Ethical considerations

Ethical approval was obtained from the Lincoln University College Ethics Committee, and authority to conduct the study was granted by the Benue State Research Ethical Review Committee. Participation was entirely voluntary, confidentiality was assured through the use of codes in place of names, and verbal informed consent was obtained from each respondent before data collection.

4. Results

4.1 Extent of antenatal care provision

Table 1. Extent to which antenatal care services are provided (N = 400)

S/N	Item	Mean	SD	Remark
1	Hospital consistently offers prescribed pregnancy investigations (scans, x-rays, laboratory tests)	2.00	± 0.73	Low extent
2	Mothers have access to excellent care throughout pregnancy and labour	1.90	± 1.05	Low extent
3	Medications and medical supplies are provided to ensure a safe pregnancy	1.61	± 0.85	Low extent

S/N	Item	Mean	SD	Remark
4	ANC centre educates expectant mothers about healthy eating	2.90	±0.73	High extent
5	Mothers receive a tetanus vaccination during prenatal visits	3.17	±0.77	High extent
6	ANC centre educates mothers about early indicators of pregnancy-related problems	3.23	±1.01	High extent
	Aggregate Mean ± SD	2.51	±0.86	High extent
	<i>Criterion Mean</i>	2.50		

Note. Criterion mean = 2.50. Items scored on a 4-point scale (Very High Extent = 4 to Very Low Extent = 1).

Table 1 presents the extent of antenatal care provision. Three items exceeded the criterion mean, indicating that mothers are educated on healthy eating ($\bar{x} = 2.90$), vaccinated against tetanus ($\bar{x} = 3.17$), and taught to recognise early danger signs ($\bar{x} = 3.23$). Three items fell below the benchmark, showing limited availability of prescribed investigations ($\bar{x} = 2.00$), high-quality care through pregnancy and labour ($\bar{x} = 1.90$), and medicines and supplies for a safe pregnancy ($\bar{x} = 1.61$). The aggregate mean of 2.51 (SD = ±0.86) exceeded the criterion, indicating that antenatal care is provided to a high extent, driven largely by its educational and preventive components rather than by the supply of investigations and commodities.

4.2 Extent of delivery care provision

Table 2. Extent to which delivery care services are provided (N = 400)

S/N	Item	Mean	SD	Remark
7	Health facility always ensures all delivery equipment and supplies are available	1.55	±0.74	Low extent
8	Place of delivery is clean, warm and comfortable	1.54	±0.98	Low extent
9	Mothers are informed about all necessary procedures during childbirth	2.01	±0.96	Low extent
10	Facility seeks mothers' consent before performing childbirth-related procedures	1.98	±0.78	Low extent

S/N	Item	Mean	SD	Remark
11	Facilities in the neighbourhood do not offer high-quality care	3.46	± 0.84	High extent
12	Every care provider in the birth room has received obstetric-emergency training	2.73	± 1.24	High extent
	Aggregate Mean $\pm$ SD	2.21	± 0.92	Low extent
	<i>Criterion Mean</i>	2.50		

Note. Criterion mean = 2.50.

As Table 2 shows, delivery care was the weakest component of provision. Respondents reported that facilities do not reliably stock delivery equipment and supplies ($\bar{x} = 1.55$), that the place of delivery is often neither clean, warm nor comfortable ($\bar{x} = 1.54$), and that mothers are frequently neither informed of procedures ($\bar{x} = 2.01$) nor asked for consent ($\bar{x} = 1.98$). The two items that scored above the benchmark reinforce this picture, since they register agreement that neighbourhood facilities do not offer high-quality care ($\bar{x} = 3.46$). The aggregate mean of 2.21 ($SD = \pm 0.92$) fell below the criterion, indicating that delivery care is provided to a low extent.

4.3 Extent of postnatal care provision

Table 3. Extent to which postnatal care services are provided (N = 400)

S/N	Item	Mean	SD	Remark
13	Local facilities give guidance on breastfeeding/infant feeding (baby-friendly)	2.86	± 1.17	High extent
14	Mothers are advised on available family-planning services	3.57	± 0.66	High extent
15	Maternity departments have thermometers and sphygmomanometers for PNC monitoring	2.69	± 1.22	High extent
16	Facility provides insecticide-treated nets (ITNs) to women in the postnatal period	3.02	± 0.95	High extent
17	Facility provides tetanus toxoid vaccine to mothers during the postnatal period	1.71	± 0.96	Low extent

S/N	Item	Mean	SD	Remark
18	Providers assess neonates at six-week postnatal follow-up	1.84	± 0.78	Low extent
	Aggregate Mean $\pm$ SD	2.62	± 0.96	High extent
	<i>Criterion Mean</i>	2.50		

Note. Criterion mean = 2.50.

Table 3 indicates that postnatal care is provided to a high extent overall (aggregate $\bar{x} = 2.62$; SD = ± 0.96). Facilities were reported to provide breastfeeding guidance ($\bar{x} = 2.86$), family-planning advice ($\bar{x} = 3.57$), basic monitoring equipment ($\bar{x} = 2.69$) and insecticide-treated nets ($\bar{x} = 3.02$). Two elements fell short: provision of tetanus toxoid in the postnatal period ($\bar{x} = 1.71$) and six-week neonatal assessment ($\bar{x} = 1.84$), pointing to gaps in the continuity of newborn follow-up.

4.4 Facility readiness

The observational checklist assessed the seven sampled facilities across five domains. On physical structure, most facilities were rated good or adequate against National Primary Health Care Development Agency (NPHCDA) criteria, although regularity of power supply and cleanliness of water and latrines were comparatively weak. Table 4 summarises the availability of the minimum equipment package.

Table 4. Availability of the minimum equipment package (n = 7 facilities)

Equipment	Functional n (%)	Not functional n (%)
Artery forceps	5 (71.4)	2 (28.6)
Stainless-steel bowl with cotton wool	7 (100.0)	0 (0.0)
Dissecting forceps (15 cm)	6 (85.7)	1 (14.3)
Sphygmomanometer	6 (85.7)	1 (14.3)
Weighing scale (adult)	6 (85.7)	1 (14.3)
Weighing scale (infant)	5 (71.4)	2 (28.6)
Cold box/vaccine carrier	5 (71.4)	2 (28.6)

Equipment	Functional n (%)	Not functional n (%)
Foetal stethoscope	5 (71.4)	2 (28.6)
Hospital bed	7 (100.0)	0 (0.0)
Examination couch	7 (100.0)	0 (0.0)
Vaginal specula (Sims, S/M/L)	2 (28.6)	5 (71.4)
Privacy screen	1 (14.3)	6 (85.7)
Thermometer	7 (100.0)	0 (0.0)
Needles and syringes	7 (100.0)	0 (0.0)

Note. Selected items from the minimum equipment package; percentages of the seven assessed facilities.

As Table 4 shows, all seven facilities held the majority of core equipment in functional condition; the principal gaps were vaginal specula (functional in only 28.6% of facilities) and privacy screens (14.3%), both directly relevant to safe, dignified examination and delivery. Essential drugs and consumables were broadly available—needles, cotton wool, gloves, antiseptic, sutures and ergometrine were present in every facility—though several antimalarials and antibiotics were stocked in insufficient quantities. On personnel, all facilities had medical officers, nurses and midwives, community health extension workers, records, administrative and environmental-health officers and pharmacy technicians; community health officers (absent in 42.9%) and laboratory technologists (absent in 28.6%) were the main shortfalls. Table 5 summarises the services offered.

Table 5. Services offered by the assessed facilities (n = 7)

Service	Available n (%)	Not available n (%)
Antenatal care services	7 (100.0)	0 (0.0)
Immunisations	7 (100.0)	0 (0.0)
Delivery service	4 (57.1)	3 (42.9)
Laboratory services	5 (71.4)	2 (28.6)

Service	Available n (%)	Not available n (%)
Outpatient services	4 (57.1)	3 (42.9)
Family planning	3 (42.9)	4 (57.1)
Postnatal services	3 (42.9)	4 (57.1)
In-patient services	3 (42.9)	4 (57.1)
Parenteral oxytocic administration	7 (100.0)	0 (0.0)
Manual removal of placenta	7 (100.0)	0 (0.0)
Assisted vaginal delivery	4 (57.1)	3 (42.9)
Blood transfusion	5 (71.4)	2 (28.6)

Note. Includes selected essential obstetric-care services.

While antenatal care and immunisation were universally available, only 57.1% of facilities offered delivery services and fewer than half provided family-planning, postnatal or in-patient services. This service profile mirrors the questionnaire finding of weak delivery-care provision and highlights a structural gap in the facilities' capacity for facility-based childbirth and continuity of postpartum care.

4.5 Zonal variation in provision (Hypothesis 1)

Table 6. Chi-square test of variation in maternal health service provision across zones

Service provision	Zone A	Zone B	Zone C	χ^2	df	p
Antenatal care	120 (30.0%)	28 (7.0%)	7 (1.8%)	87.346	4	<0.05
Delivery care	9 (2.3%)	140 (35.0%)	27 (6.8%)			
Postnatal care	41 (10.3%)	21 (5.3%)	7 (1.8%)			

Note. Significant at $p < 0.05$.

The chi-square test returned a value of 87.346 (df = 4; $p < 0.05$), leading to rejection of the null hypothesis. The three geographical zones of Benue State therefore differ significantly in the level of maternal health service provision. The distribution is uneven and service-specific: antenatal

provision was concentrated in Zone A, whereas delivery-care provision was concentrated in Zone B, indicating that no single zone offers a uniformly strong maternal-care package.

5. Discussion

The aim of this study was to describe the reported level of maternal health service provision and the observed level of readiness in Benue State. This finding of high provision of ANC and focus on the educational and prevention-focused components of ANC (nutrition counselling, tetanus vaccination and danger-sign education) aligns with the WHO (2017) recommendations for positive pregnancy experiences and previous studies that have shown that these information-focused aspects of ANC are the most consistently delivered (Osungbade, Oginni & Olumide, 2020). Meanwhile, the poor performance on prescribed investigations, medicines and supplies reflects the longstanding reports of gaps in commodities and diagnostics in Nigerian facilities, implying that the capacity of the antenatal care provision is limited to counselling.

The weakest domain is also the most important one – delivery care. The current results – inconsistent delivery supplies, poor delivery environment and limited informed consent – are consistent with broader evidence that the distribution of facilities is unequal and that many facilities lack the capacity to provide safe childbirth (Sadiq et al., 2017; Sanni, 2020). The facility assessment confirms the information provided in the questionnaire: less than half of the facilities assessed provided family-planning, postnatal and in-patient services, and key items like vaginal specula and privacy screens were largely non-functional and delivery services were offered by only 57.1%. These are structural deficits that limit the delivery process, and ultimately, maternal outcomes, as per Donabedian's (1980) framework.

Postnatal care was found to be relatively good, with good coverage of breastfeeding and family-planning advice, and of insecticide-treated nets, which is in line with the WHO (2018) postnatal-care guidelines. The lack of postnatal tetanus toxoid and 6 week neonatal assessment, however, do suggest that continuity of care from prenatal to postnatal and from birth to follow-up is incomplete, a critical consideration, as improvements in counselling during pregnancy and postpartum care cannot compensate for safe delivery and follow-up.

Finally, the large zonal variation in provision ($\chi^2 = 87.346$; $p < 0.05$) is indicative. Provision was not consistently poor or good, but concentrated in specific services and areas, with good

provision in antenatal care in Zone A and good provision in delivery care in Zone B. This trend aligns with the documented sub-national variations in the distribution of health facilities and services across Nigerian states (Ibor&Atomode, 2020; Sanni, 2020) and suggests there are significant within-state inequalities that are not captured by state-wide averages and must be addressed in any strengthening strategy.

6.0 Conclusion

Provision of maternal health services in Benue State is uneven. Antenatal and post-natal care is done to a high extent, while delivery care is done to a low extent, with structural deficiencies in delivery related equipment and services in the facilities assessed. There were also marked variations between the three geographical zones of the state. The maternal-care environment is therefore a reasonably good preventive and educational services but has a critical weakness in its ability to provide safe, facility-based childbirth.

7.0 Recommendations

Government should continue to invest in and monitor the provision of antenatal services and should urgently improve the provision of delivery services: more facilities should be built, particularly in rural areas; facilities should be properly equipped and staffed by trained personnel, especially considering the lack of equipment (specula, screens) and services (delivery, in-patient, family planning) that were identified. There is a need to ensure equitable, zone-specific resource distribution to reduce the inequalities identified by the chi-square analysis and the continuity of postnatal and neonatal follow-up should be strengthened through structured 6-week assessment and postnatal immunisation.

8.0 Limitations

It was partly self-reported and there was a lack of candour or recall of responses from some of the respondents because of the promise of confidentiality. The facility component was only sampled to seven facilities, and the readiness inventory should be viewed as indicative and not comprehensive of all facilities in the State.

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