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Early Trends in Clinical Service Utilization and Haematological Profiles Following a Hospital Service Upgrade in South-Eastern Nigeria: A Retrospective Cross-Sectional Study

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Abstract:

- ***Background:***

Hospital service upgrades from specialized maternity facilities to comprehensive healthcare centers influence patient attendance patterns, diagnostic demand, and laboratory workload. However, empirical evidence describing early post-upgrade service utilization and haematological profiles in Nigerian healthcare facilities remains limited.

- ***Methods:***

A retrospective descriptive cross-sectional study was conducted at Ngozi Maternity and Hospital Services, South-Eastern Nigeria, following its service upgrade in 2025. Clinical and laboratory records of 313 patients who accessed healthcare services between 1 September and 31 December 2025 were reviewed. Data on socio-demographics, service utilization, and haematological parameters were analyzed using SPSS version 25. Descriptive statistics and inferential tests (Chi-square, independent t-test, and one-way ANOVA) were applied, with statistical significance set at $p < 0.05$.

- ***Results:***

General outpatient services accounted for the highest patient attendance (57.5%), followed by other specialized units (24.6%), maternity ward (7.6%), accident and emergency (7.3%), and antenatal clinic (2.9%). Anaemia was the most prevalent haematological abnormality (30.3%), particularly among antenatal patients, while leukocytosis predominated among emergency and outpatient attendees (35.1%). Mean haemoglobin concentration, total white blood cell count, and platelet count differed significantly across service units ($p < 0.05$).

- ***Conclusion:***

Early post-upgrade assessment demonstrated a shift toward general outpatient dominance, with haematological investigations remaining integral to clinical decision-making. Continuous monitoring of service utilization and laboratory trends is essential for evidence-based planning, efficient resource allocation, and quality improvement in newly expanded healthcare facilities.

Keywords: *Hospital Upgrade; Service Utilization; Haematological Parameters; Laboratory Medicine; Nigeria.*

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I. INTRODUCTION

Healthcare system strengthening is a central priority for improving access to quality care in low- and middle-income countries [1,2]. One widely adopted strategy involves upgrading existing healthcare facilities to expand service scope, increase diagnostic capacity, and improve patient outcomes. Hospitals transitioning from specialized maternity care to comprehensive clinical services often experience significant changes in patient demographics, disease profiles, and laboratory workload [8,15].

Maternity hospitals traditionally focus on antenatal, intrapartum, and postnatal care, where haematological investigations are critical for identifying anaemia, thrombocytopenia, and pregnancy-related inflammatory conditions [3]. Following service expansion, such facilities begin to manage a broader range of medical, surgical, and emergency cases, increasing reliance on laboratory diagnostics for timely and accurate clinical decision-making [4,5].

Ngozi Maternity and Hospital Services owerrinta, Abia State Nigeria, established in 1956 as a core maternity hospital, was upgraded in 2025 to include general outpatient clinics, accident and emergency services, and expanded laboratory support. This transition presents an opportunity to evaluate early service utilization patterns and haematological trends, which are essential for guiding staffing, infrastructure development, and laboratory resource planning.

Haematological parameters derived from routine complete blood count testing remain among the most frequently requested laboratory investigations across healthcare settings [4,12]. These parameters provide critical information on anaemia, infection, inflammation, and haemostatic disorders. Despite their importance, few studies in Nigeria have examined early post-upgrade service utilization and haematological profiles in newly expanded hospitals [10,11]. This study therefore evaluates early clinical service utilization and haematological profiles at Ngozi Maternity and Hospital Services during the first four months following its 2025 service upgrade.

II. MATERIALS AND METHODS

- *Study Design*

This study employed a retrospective descriptive cross-sectional design.

- *Study Setting*

The study was conducted at Ngozi Maternity and Hospital Services, South-Eastern Nigeria. The hospital was originally established in 1956 as a maternity facility and upgraded in 2025 to provide comprehensive outpatient, emergency, maternity, and laboratory services.

- *Study Period*

Data were collected from 1 September to 31 December 2025.

- *Study Population and Sample Size*

The study population comprised all patients who accessed clinical services and underwent haematological investigations during the study period. A total of 313 patient records met the eligibility criteria and were included, representing a census of all eligible cases.

- *Inclusion and Exclusion Criteria*

Patients with complete clinical and haematological records were included. Records with incomplete data or repeat visits within the study period were excluded.

- *Data Collection*

Data were extracted from laboratory registers and patient case notes using a structured proforma. Variables collected included age, sex, service unit accessed, pregnancy status, and haematological parameters.

- *Haematological Parameters*

Analyzed parameters included haemoglobin concentration, packed cell volume, total and differential white blood cell counts, platelet count, and red cell indices (MCV, MCH, MCHC).

- *Operational Definitions*

Anaemia was defined as haemoglobin <11 g/dL in pregnant women and <12 g/dL in non-pregnant adults. Leukocytosis was defined as total white blood cell count >11 $\times 10^9$/L, while thrombocytopenia was defined as platelet count <150 $\times 10^9$/L.

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➢ *Statistical Analysis*

Data were analyzed using SPSS version 25. Continuous variables were summarized as means ± standard deviations, while categorical variables were presented as frequencies and percentages. Chi-square test, independent t-test, and one-way ANOVA were used to compare variables across service units. Statistical significance was set at $p < 0.05$.

➢ *Ethical Considerations*

Ethical approval was obtained from the hospital management. Patient confidentiality was maintained through anonymization of records in accordance with CIOMS ethical guidelines [6].

III. RESULTS

➢ *Socio-Demographic Characteristics*

Of the 313 patients, females constituted 73.5%, while males accounted for 26.5%. The majority of patients (68.7%) were within the reproductive age group of 18–45 years.

➢ *Clinical Service Utilization*

General outpatient services recorded the highest attendance (57.5%), followed by other specialized units (24.6%), maternity ward (7.6%), accident and emergency (7.3%), and antenatal clinic (2.9%).

➢ *Haematological Abnormalities*

Anaemia was the most prevalent haematological abnormality (30.3%), followed by leukocytosis (35.1%) and thrombocytopenia (8.9%). Normal haematological findings were observed in 25.6% of patients.

➢ *Comparison of Haematological Parameters*

Mean haemoglobin concentration was lowest among antenatal patients, while mean white blood cell count was highest among emergency attendees. Significant differences were observed in haemoglobin, white blood cell, and platelet counts across service units ($p < 0.05$).

IV. 4. DISCUSSION

This study provides early institutional evidence on clinical service utilization and haematological trends following the upgrade of a maternity hospital to a comprehensive healthcare facility in South-Eastern Nigeria. The predominance of general outpatient attendance reflects rapid community uptake of newly available services, consistent with findings from similar Nigerian settings following facility expansion [8,10,15].

The relatively low antenatal attendance during the early post-upgrade period may reflect referral patterns, seasonal variation, or limited early awareness of expanded services. Nevertheless, anaemia remained highly prevalent among antenatal patients, aligning with previous Nigerian studies that report persistent maternal anaemia despite antenatal care utilization [3,7,13].

Leukocytosis was most common among emergency and outpatient attendees, suggesting a substantial burden of acute infectious and inflammatory conditions. Similar patterns have been reported in emergency-based studies in low-resource settings [14]. The observed differences in haematological parameters across service units highlight the critical role of laboratory diagnostics in supporting clinical decision-making following hospital service expansion [11,16].

Strengthening laboratory systems and integrating diagnostic services with clinical care remain essential for improving healthcare quality and outcomes in newly expanded facilities [17,18].

V. LIMITATIONS

The retrospective design limits causal inference, and the absence of pre-upgrade baseline data restricts direct comparison. Additionally, the four-month study duration may not capture seasonal variations in disease patterns.

VI. CONCLUSION

The 2025 hospital service upgrade was associated with increased utilization of general outpatient services and sustained reliance on haematological investigations. Early monitoring of service utilization and laboratory trends provides valuable evidence for staffing, resource allocation, and quality improvement in newly expanded healthcare facilities.

RECOMMENDATIONS

Routine haematological screening should be strengthened across all service units. Continuous monitoring of service utilization trends should guide staffing and infrastructure expansion. Laboratory clinical integration should be enhanced, and periodic audits of haematological data should be conducted to monitor disease patterns.

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