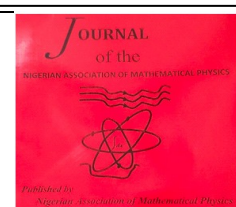


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## PAEDIATRIC HEALTHCARE SERVICES IN RURAL COMMUNITIES IN NIGERIA: CHALLENGES AND OPPORTUNITIES

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### ABSTRACT

*Paediatric care is a critical component of healthcare systems worldwide, focusing on the health and well-being of infants, children, and adolescents. In Africa, paediatric care services face unique challenges and opportunities due to the continent's diverse cultural, economic, and geographical landscape. This article explores the state of paediatric care in Africa, examining the challenges faced, the progress made, and the strategies required to improve health outcomes for children across the continent. A systematic literature review and qualitative analysis was adopted in understanding the challenges with paediatric care in Nigeria and also the areas of opportunities to improve on the services were also highlighted. Challenges identified include prevalence of Infectious diseases, Malaria endemic, Malnutrition, Funding for healthcare, Cultural and social barriers. Investing in research and innovation is vital for developing effective interventions and policies to improve paediatric care in Africa. And for Nigeria to record a significant improvement in rural paediatric healthcare delivery, it will require Innovative use of technology that can enhance the current services. Telemedicine can be adopted but design to address the socio-cultural barriers that are inhibiting the delivery of rural healthcare and implementing targeted interventions and fostering collaboration among stakeholders, can possibly improve health outcomes for children in rural southern Nigeria and ensure a healthier future for the region.*

### 1. Introduction

Paediatric care is a critical component of healthcare systems worldwide, focusing on the health and well-being of infants, children, and adolescents. In Africa, paediatric care services face unique challenges and opportunities due to the continent's diverse cultural, economic, and geographical landscape. This article explores the state of paediatric care in Africa, examining the challenges faced, the progress made, and the strategies required to improve health outcomes for children across the continents.

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Africa bears a disproportionate share of the global burden of paediatric diseases. According to the World Health Organization (WHO), sub-Saharan Africa accounts for more than half of the global under-five mortality rate, with conditions such as pneumonia, diarrhea, malaria, and malnutrition being leading causes of death among children (WHO, 2023). Despite significant improvements in recent years, the under-five mortality rate remains alarmingly high in many African countries. Nigeria has made some progress in reducing child mortality rates, but significant challenges remain, especially in rural areas. According to the World Health Organization (WHO), the under-five mortality rate in Nigeria was 100.2 per 1,000 live births in 2021, with rural areas experiencing higher rates than urban centres (WHO, 2021). Malaria, pneumonia, diarrhea, and malnutrition are the leading causes of death among children in rural Nigeria (UNICEF, 2023). Healthcare infrastructure in rural Nigeria is often inadequate, with many communities lacking basic healthcare facilities. According to a report by the Nigerian National Primary Health Care Development Agency (NPHCDA), only about 20% of rural health facilities have the minimum package of essential services (NPHCDA, 2022). This lack of infrastructure significantly impacts the quality and availability of paediatric healthcare services. There is a critical shortage of healthcare professionals in rural Nigeria. The WHO recommends a minimum of one doctor per 1,000 people, but many rural areas in Nigeria have far fewer, with some regions having only one doctor per 5,000 people (WHO, 2021). The shortage of paediatricians, nurses, and community health workers exacerbates the challenges in delivering effective healthcare services to children in these areas.

## **2.0 RELATED WORKS**

Adedokun et al., (2017) from their work highlight that utilization of healthcare service for acute childhood illnesses was influenced by not only maternal factors but also community-level factors, suggesting that public health strategies should recognize this complex web of individual composition and contextual composition factors to guide provision of healthcare services. The study was based on secondary analyses of cross-sectional population-based data from the 2013 Nigeria Demographic and Health Survey (DHS). Multilevel logistic regression models were applied to the data on 6,427 under-five children who used or did not use health care service when they were sick (level 1), nested within 896 communities (level 2) from 37 states (level 3). Sub-Saharan African countries face major barriers including stigma and negative attitudes, poverty and insufficient resources, inadequate policy implementations, physical inaccessibility, lack of transportation, lack of privacy, and inadequately trained healthcare professionals as well as limited access to healthcare services in the low and middle income Sub-Saharan African countries due to poverty, low education, inadequate healthcare systems, and shortage of healthcare professionals were identified as factors that affect healthcare service delivery (Adugna, et al., 2020).

### **2.1 Challenges in Paediatric Healthcare Services:**

Infectious diseases remain a major challenge for paediatric care in Africa. Malaria, for example, is endemic in many parts of the continent and is a leading cause of morbidity and mortality among children. Despite the availability of effective treatments and preventive measures, such as insecticide-treated bed nets and antimalarial drugs, access to these resources is often limited, particularly in remote areas (UNICEF, 2023). In rural Nigeria, Malaria is endemic and a leading cause of morbidity and mortality among children. Despite the availability of preventive measures such as insecticide-treated bed nets and antimalarial drugs, access remains limited in many rural areas (UNICEF, 2023). Similarly, vaccine-preventable diseases such as measles and polio continue to pose significant threats due to low immunization coverage.

HIV/AIDS also significantly impacts paediatric health in Africa. Although antiretroviral therapy (ART) has dramatically improved the prognosis for children living with HIV, many still face barriers to accessing these lifesaving medications. Stigma, discrimination, and lack of awareness further complicate efforts to provide comprehensive care for HIV-positive children. Malnutrition is a pervasive issue in rural Nigeria, affecting nearly one-third of children under five. Stunting, wasting, and micro-nutrient deficiencies are common, severely impacting child development and increasing susceptibility to infections (UNICEF, 2023). Food insecurity, poor dietary practices, and limited access to healthcare services contribute to high rates of malnutrition in rural communities.

Funding for healthcare in rural Nigeria is insufficient, leading to a lack of essential medicines, equipment, and infrastructure. Many rural health facilities operate with minimal resources, making it difficult to provide comprehensive paediatric care. According to the Nigerian Ministry of Health, rural healthcare facilities receive less than 30% of the total healthcare budget, despite serving a significant portion of the population (Ministry of Health, 2021).

Cultural and social barriers also impact the delivery of paediatric healthcare services in rural Nigeria. Traditional beliefs and practices can sometimes hinder the acceptance of modern medical interventions. Additionally, gender disparities and limited education levels among rural populations contribute to lower healthcare utilization rates for children (WHO, 2021).

Immunization is one of the most effective interventions for preventing infectious diseases among children. Over the past few decades, African countries have made significant strides in expanding immunization coverage. For instance, the introduction of the pneumococcal conjugate vaccine (PCV) and the rotavirus vaccine has led to substantial reductions in pneumonia and diarrhea-related deaths among children (GAVI, 2023). Government hospitals are faced with several challenges, including a lack of infrastructure, dearth of resources and a lack of trained personnel. However, establishment of a telemedicine centre in some of the hospital has been able to address this problem to some extent. The establishment of a telemedicine centre at the Paediatric Department of BDTH, Kaduna, Nigeria, has had a significant impact on patient care, particularly for children who may not have had access to specialist care otherwise (Musa, et al., 2023). (Yossef, et al., 2024) Delivering child and youth healthcare to rural communities can be challenging, especially as it involves specialized care particularly in many low-and middle-income countries (LMICs) as they depend on new medical graduates or non-physician-clinicians (NPCs) in rural and hard-to-reach areas.

Infectious diseases remain a major challenge in rural Nigeria. Malaria is endemic and a leading cause of morbidity and mortality among children. Despite the availability of preventive measures such as insecticide-treated bed nets and antimalarial drugs, access remains limited in many rural areas (UNICEF, 2023). Similarly, vaccine-preventable diseases such as measles and polio continue to pose significant threats due to low immunization coverage. Malnutrition is a pervasive issue in rural Nigeria, affecting nearly one-third of children under five. Stunting, wasting, and micronutrient deficiencies are common, severely impacting child development and increasing susceptibility to infections (UNICEF, 2023). Food insecurity, poor dietary practices, and limited access to healthcare services contribute to high rates of malnutrition in rural communities. Several factors contribute to high malnutrition rates in these communities. Food insecurity, poor dietary practices, and inadequate maternal and child health services are prevalent. Additionally, cultural practices and a lack of nutritional education among parents exacerbate the problem. Efforts to improve nutritional outcomes must address these underlying causes to be effective (UNICEF, 2023).

Vaccine-preventable diseases, including measles, polio, and hepatitis B, continue to pose substantial risks to children in rural southern Nigeria. Immunization coverage in these areas remains below the national average, largely due to logistical challenges, inadequate healthcare infrastructure, and vaccine hesitancy (UNICEF, 2023). The Nigerian National Primary Health Care Development Agency (NPHCDA) has identified rural regions as key areas needing improved vaccination outreach (NPHCDA, 2022).

### 3.0 REVIEW OF PAEDIATRIC HEALTH CARE IN NIGERIA

In Delta State, efforts to control malaria through the distribution of ITNs and community health education have faced significant challenges. Limited funding, logistical barriers, and resistance to using ITNs have hindered the effectiveness of these programs. Despite these challenges, ongoing efforts by local health authorities and international partners aim to improve malaria prevention and treatment in rural areas (UNICEF, 2023).

Akwa Ibom State implemented community-based nutrition programs to address high rates of child malnutrition even though the interventions have shown some success, they are often hampered by inconsistent funding and limited reach (NPHCDA, 2022).

In Cross River State, the initiatives to address healthcare workforce shortages has faced sustainability challenges due to funding constraints and high turnover rates among healthcare workers (USAID, 2023).

A comprehensive view of paediatric care issues across Nigeria's six geopolitical zones, using key indicators such as under-five mortality rates, immunization coverage, malnutrition rates, healthcare infrastructure, and workforce distribution reveal the regional disparities and highlight critical areas for improvement.

As shown in table 1 to table 2.

**Table 1: Under-Five Mortality Rates (per 1,000 live births) by Geopolitical Zone**

Geopolitical Zone	Under-Five Mortality Rate (2023)
North Central	80
North East	120
North West	130
South East	70
South South	75
South West	65

**Table 2: Percentage of Fully Functional Primary Health Centres by Geopolitical Zone**

Geopolitical Zone	Fully Functional PHCs (2023)
North Central	45%
North East	35%
North West	30%
South East	60%
South South	55%
South West	70%

Table 2 shows that in terms of infrastructure, that seem to be more done in the South West compare to the South-South zone.

**Table 3: Number of Paediatricians per 10,000 Children by Geopolitical Zone**

Geopolitical Zone	Pediatricians per 10,000 Children (2023)
North Central	1.2
North East	0.8
North West	0.7
South East	2.5
South South	2.0
South West	2.8

Table 1 show that mortality rate is still high across all the zones and this can be associated with the lack of more professional paediatricians.

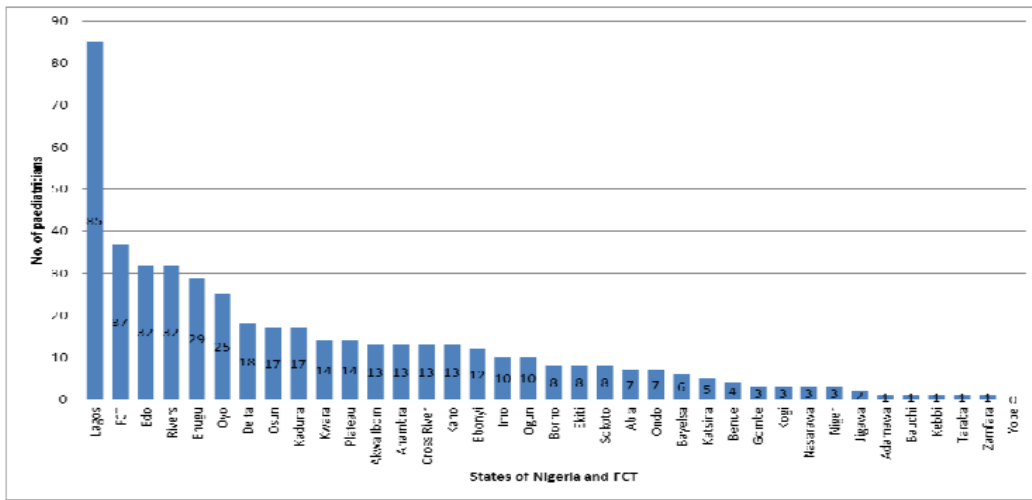


Figure 1 *Population and Demographics* (Ekure, 2012)

Figure 1 demonstrates the number of paediatricians by state and population. Lagos and Kano states had the largest populations but Kano state unlike Lagos had much fewer paediatricians.

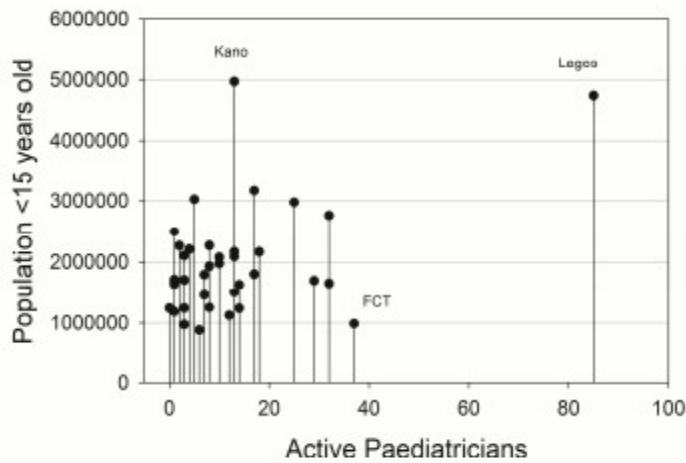


Figure 2 Actively practicing paediatricians by State and population. (Ekure, 2012)

The figure 2 shows that there are wide variations in the average child to-paediatrician ratios in each of the six geopolitical zones with a trending towards lower ratios in the South zones as. The North East had the highest average ratio (718,412:1) while South West had the lowest average ratio. The study shows that Paediatricians are grossly inadequate in Nigeria with huge child-to-paediatricians ratios. There is also uneven

distribution of the paediatricians with higher numbers in the southern states with either teaching hospitals or increased wealth. Zones of the country with lower child-to -paediatrician ratios also experience lower childhood mortality rates and higher DPT vaccination coverage (Ekure, 2012).

### **3.1 Existing Policies and Challenges**

#### **3.1.1 Infectious Diseases**

Malaria, pneumonia, diarrhea, and vaccine-preventable diseases remain leading causes of child mortality in Nigeria. Immunization rates are below the national average in rural areas due to logistical challenges and vaccine hesitancy (UNICEF, 2023). Studies indicate that only 57% of Nigerian children receive the recommended childhood immunizations, with rural areas experiencing a much lower coverage rate (NPHCDA, 2023).

#### **3.1.2 Malnutrition**

Nearly one-third of Nigerian children under five suffer from malnutrition. Limited food security, poor maternal education, and inadequate nutritional programs contribute to high rates of stunting and wasting (UNICEF, 2023). Empirical evidence suggests that malnutrition is a major determinant of paediatric mortality, as undernourished children are more susceptible to infections and developmental impairments.

#### **3.1.3 Healthcare Infrastructure and Workforce Shortages**

Nigeria falls short of the WHO-recommended doctor-to-patient ratio of 1:1,000. Some rural areas have only one doctor per 5,000 people, exacerbating healthcare accessibility issues (WHO, 2021). The uneven distribution of paediatricians further widens the healthcare gap. A 2022 survey by the Nigerian Medical Association (NMA) found that 60% of paediatricians practice in urban centres, leaving rural areas underserved.

#### **3.1.4 Financial Constraints**

Government funding for rural healthcare remains insufficient, with rural health centres receiving less than 30% of the national healthcare budget (Ministry of Health, 2021). As a result, many facilities operate without essential medicines, equipment, or adequately trained staff. Studies indicate that out-of-pocket healthcare expenses account for over 70% of healthcare costs in Nigeria, placing a heavy burden on rural families (World Bank, 2022).

#### **3.1.5 Socio-Cultural Barriers**

Traditional beliefs, low literacy levels, and gender disparities affect healthcare-seeking behaviour. Many families in rural Nigeria rely on traditional medicine instead of modern healthcare services, leading to preventable child mortality (WHO, 2021). Case studies suggest that community engagement and culturally sensitive health education can significantly improve healthcare utilization rates.

## **4.0 DISCUSSION**

### **4.1 Adoption of Innovative Technology in Healthcare**

Innovative use of technology can enhance paediatric healthcare delivery in rural Nigeria. Mobile health (mHealth) initiatives, for example, use mobile phone technology to provide health information, reminders for vaccinations, and support for disease management. Telemedicine programs can help bridge the gap in access to specialist care by connecting healthcare providers in rural areas with experts in urban centres. These technological solutions can improve access to

and the quality of healthcare services for children (WHO, 2021). With Telemedicine, remote diagnosis and treatment of patients via telecommunications technology, will revolutionized healthcare delivery. The technology provides significant advantages, particularly in enhancing access to medical services in underserved areas and it eliminating geographical barriers by ensuring that patients in rural and remote locations receive timely medical consultations and care, which can lead to early diagnosis and better health outcomes (WHO, 2020). Additionally, it reduces the need for travel, saving time and costs for both patients and healthcare providers. Telemedicine also facilitates continuous monitoring and management of chronic conditions, improving overall patient management and satisfaction (Mayo Clinic, 2021).

Addressing malnutrition requires a multifaceted approach, including improving food security, promoting breastfeeding, and providing micronutrient supplementation. Community-based nutrition programs that involve local stakeholders can be particularly effective in reaching vulnerable populations and improving child health outcomes. Strengthening agricultural practices and food distribution systems can also enhance food security and reduce malnutrition rates (UNICEF, 2023).

Strengthening health systems is essential for improving paediatric care services in Africa. This includes increasing investment in healthcare infrastructure, ensuring a reliable supply of essential medicines and equipment, and enhancing the training and retention of healthcare workers. Health system strengthening also involves improving health information systems to support better planning, monitoring, and evaluation of healthcare services (WHO, 2023). Addressing the social determinants of health is critical for improving paediatric health outcomes in Africa. This involves tackling issues such as poverty, education, sanitation, and access to clean water. Programs that focus on improving maternal education, promoting gender equality, and enhancing social protection can have a significant impact on child health. Furthermore, multisectoral approaches that involve collaboration between health, education, agriculture, and other sectors are essential for addressing the root causes of poor health (WHO, 2023).

Investing in research and innovation is vital for developing effective interventions and policies to improve paediatric care in Africa. This includes supporting local research initiatives, building research capacity, and fostering partnerships between African institutions and international organizations. Additionally, promoting the use of data and evidence in decision-making can help ensure that healthcare policies and programs are based on the best available knowledge (WHO, 2023).

#### **4.2 Government Approach to Paediatric Care in Nigeria**

In Kebbi State, an integrated health services program has shown significant improvements in paediatric healthcare. The program includes the provision of essential health services such as immunizations, nutritional support, and treatment for common childhood illnesses. Community health workers are trained and supported to deliver these services, and mobile clinics are used to reach remote areas. This approach has led to increased immunization coverage and reduced rates of malnutrition and infectious diseases among children in Kebbi State (NPHCDA, 2022).

Bauchi State has implemented a mobile health clinic program to improve access to paediatric healthcare in rural areas. These mobile clinics provide a range of services, including vaccinations, antenatal care, and treatment for common illnesses. The program has been successful in reaching underserved populations and improving health outcomes for children. It



also serves as a model for other states seeking to enhance healthcare delivery in rural communities (UNICEF, 2023).

In Ekiti State, the expansion of community health worker programs has significantly improved paediatric healthcare services. CHWs are trained to provide essential healthcare services, conduct health education sessions, and facilitate referrals to higher levels of care. This program has improved immunization rates, increased access to nutritional support, and enhanced the overall health and well-being of children in rural areas (USAID, 2023).

There is a severe shortage of healthcare professionals in rural southern Nigeria, particularly paediatricians and nurses. The WHO recommends a minimum of one doctor per 1,000 people, but many rural areas fall far short of this benchmark (WHO, 2021). This shortage is partly due to the migration of healthcare workers to urban centres or abroad in search of better opportunities. Healthcare workers in rural areas often lack adequate training and support to provide high-quality paediatric care. Continuous professional development opportunities are limited, and many healthcare workers are not well-versed in the latest paediatric healthcare practices. This gap in training and support affects the quality of care that children receive and contributes to poor health outcomes (NPHCDA, 2022).

The government of Cross River State, initiatives to address healthcare workforce shortages include training programs for community health workers (CHWs) and incentives to attract healthcare professionals to rural areas. These programs have improved healthcare delivery in some communities (USAID, 2023)

Akwa Ibom State government has implemented a community-based nutrition programs to address the high rates of child malnutrition. These programs include nutrition education, the promotion of exclusive breastfeeding, and the distribution of micronutrient supplements (NPHCDA, 2022).

### **4.3 BEST PRACTICES FROM OTHER COUNTRIES**

#### **4.3.1 Ghana's National Health Insurance Scheme (NHIS)**

Ghana implemented NHIS, which subsidizes child healthcare, increasing access to medical services in rural areas. A similar approach in Nigeria could improve paediatric care affordability.

#### **4.3.2 India's Telemedicine Model**

India has successfully integrated telemedicine to bridge the healthcare gap in rural communities. Nigeria could adopt mobile health (mHealth) initiatives to enhance rural paediatric healthcare. A 2021 study on India's telemedicine model found a 40% reduction in paediatric emergency cases due to early remote consultations (Indian Health Ministry, 2021).

#### **4.3.3 Brazil's Community Health Worker Program**

Brazil employs community health workers to provide basic healthcare services. Implementing a similar model in Nigeria could improve healthcare delivery in underserved regions. Evidence from Brazil shows that child mortality decreased by 34% in regions with active community health programs (World Health Organization, 2022).

### **5.0 PROPOSED ACTION PLAN FOR IMPROVEMENT**

### **5.1 Strengthening Healthcare Infrastructure**

- Increase government funding for rural healthcare facilities.
- Improve rural healthcare centres with essential medical equipment and medications.
- Expand primary healthcare networks to remote areas.
- Implement policies ensuring equitable distribution of healthcare resources.

### **5.2 Expanding Paediatric Workforce**

- Offer financial incentives to encourage paediatricians to work in rural areas.
- Strengthen training programs for community health workers to provide paediatric care.
- Introduce telemedicine services to connect rural health providers with urban specialists.
- Establish paediatric residency programs in rural hospitals.

### **5.3 Enhancing Immunization Programs**

- Launch community-based vaccination drives.
- Partner with NGOs and international organizations to ensure vaccine availability.
- Address vaccine hesitancy through education and awareness campaigns.
- Implement mobile vaccination units for remote communities.

### **5.4 Improving Nutrition and Food Security**

- Implement school feeding programs to combat child malnutrition.
- Educate mothers on nutrition and breastfeeding practices.
- Establish local food banks and agricultural support programs.
- Integrate nutrition education into primary school curricula.

### **5.5 Leveraging Technology for Better Healthcare Delivery**

- Expand telemedicine initiatives for remote diagnosis and consultations.
- Deploy mobile health applications for vaccination tracking and maternal health education.
- Use artificial intelligence (AI) for disease prediction and early intervention.
- Develop electronic health records to track paediatric health data.

## CONCLUSION

Improving paediatric healthcare in rural Nigeria requires a multi-faceted approach, combining enhanced infrastructure, workforce expansion, increased immunization efforts, improved nutrition programs, and technology-driven solutions. By implementing targeted interventions and fostering collaboration among stakeholders, Nigeria can significantly improve health outcomes for children in rural communities and ensure a healthier future for its younger population. Empirical data suggests that integrating evidence-based interventions and policy reforms can lead to sustainable improvements in paediatric healthcare outcomes.

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