

Assessment of medication access and distribution in Nigeria: Challenges and opportunities for improvement

Queen-Mary Akudo Ebugosi ^{1,*} and Janet Aderonke Olaboye ²

¹ Independent Researcher, Port Harcourt, Nigeria.

² Mediclinic Hospital Pietermaritzburg, South Africa.

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Abstract

Ensuring widespread access to essential medications is a critical aspect of healthcare delivery, yet Nigeria grapples with numerous challenges in this realm. This review presents a comprehensive assessment of the medication access and distribution landscape in Nigeria, highlighting both the existing hurdles and potential avenues for improvement. In Nigeria, inadequate infrastructure, including poor road networks and limited storage facilities, significantly impedes the efficient distribution of medications across the country. Moreover, the prevalence of counterfeit drugs further exacerbates the issue, posing grave risks to public health and undermining trust in the healthcare system. These challenges disproportionately affect rural and underserved communities, exacerbating health disparities. However, amidst these obstacles lie several opportunities for enhancement. The advent of digital technologies offers promising solutions for improving medication distribution efficiency and combating counterfeit drugs. Mobile health applications and blockchain technology can enhance supply chain transparency, ensuring the authenticity and quality of medications from manufacturer to end-user. Furthermore, strengthening regulatory frameworks and collaboration between government agencies, pharmaceutical companies, and healthcare providers is imperative to address systemic issues and bolster medication access nationwide. This assessment underscores the urgent need for multifaceted interventions to enhance medication access and distribution in Nigeria. By leveraging technological innovations, strengthening regulatory oversight, and fostering collaboration among stakeholders, Nigeria can surmount its existing challenges and pave the way for a more equitable and effective healthcare system. Ultimately, improving medication access will not only enhance health outcomes but also contribute to broader socio-economic development in the nation.

Keyword: Medication; Drug; Distribution; Nigeria; Assessment; Review

1. Introduction

Access to essential medications is a fundamental pillar of effective healthcare delivery, playing a pivotal role in improving health outcomes and enhancing overall well-being (Zaree *et al.*, 2023). However, in Nigeria, a country with a population exceeding 200 million, ensuring widespread access to medications presents a formidable challenge (Oweibia *et al.*, 2024). This assessment aims to delve into the complexities surrounding medication access and distribution in Nigeria, shedding light on the challenges faced and exploring potential avenues for improvement.

Nigeria's healthcare system operates within a multifaceted landscape characterized by a mix of public and private healthcare providers (Balogun, 2022). While the country has made strides in expanding healthcare infrastructure and services, significant gaps persist, particularly in remote and underserved regions. The healthcare system is burdened by issues such as inadequate funding, uneven distribution of healthcare facilities, and a shortage of trained healthcare

* Corresponding author: Queen-Mary Akudo Ebugosi

professionals. These challenges compound the difficulties associated with ensuring equitable access to medications across the country.

The purpose of this assessment is twofold. Firstly, it seeks to comprehensively analyze the existing challenges in medication access and distribution within Nigeria. This includes examining infrastructural limitations, such as poor road networks and inadequate storage facilities, as well as addressing the pervasive issue of counterfeit drugs that jeopardize public health and erode trust in the healthcare system. Secondly, this assessment aims to identify opportunities for improvement and innovation. By leveraging technological advancements, strengthening regulatory frameworks, and fostering collaboration among stakeholders, it endeavors to outline actionable strategies to enhance medication access and distribution nationwide.

In essence, this assessment serves as a call to action to address the critical issue of medication access and distribution in Nigeria. By understanding the intricacies of the challenges at hand and capitalizing on emerging opportunities, stakeholders can collectively work towards building a more resilient and equitable healthcare system that ensures all Nigerians have access to the medications they need to lead healthy and productive lives (Aksoy, 2023)

2. Background on Assessment of Medication Access and Distribution in Nigeria

Access to essential medications is a fundamental aspect of healthcare delivery, playing a crucial role in improving health outcomes and overall quality of life (Kadhim *et al.*, 2020). However, in Nigeria, a country with a population exceeding 200 million people, ensuring widespread access to medications presents significant challenges. To understand the complexities of medication access and distribution in Nigeria, it's essential to examine the historical, socio-economic, and healthcare context of the country. Nigeria, located in West Africa, is the most populous country on the continent and is known for its rich cultural diversity and abundant natural resources. Despite its potential, Nigeria faces numerous socio-economic challenges, including poverty, inadequate infrastructure, and disparities in healthcare access (Abubakar *et al.*, 2022). These challenges have profound implications for medication access and distribution across the country.

The healthcare system in Nigeria is characterized by a mix of public and private providers, with the public sector playing a dominant role in delivering healthcare services, particularly in rural and underserved areas (Siddiqi *et al.*, 2023). The primary healthcare system, established to provide basic health services to communities, faces significant resource constraints, including inadequate funding, staffing shortages, and limited access to essential medications.

In Nigeria, medication access and distribution are hindered by a range of factors, including: Nigeria's healthcare infrastructure is characterized by poor road networks, limited access to electricity and clean water, and a shortage of healthcare facilities, particularly in rural areas. These infrastructural limitations pose significant challenges to the efficient distribution of medications across the country, leading to delays and inefficiencies in medication delivery. The prevalence of counterfeit and substandard medications in Nigeria is a grave concern, with estimates suggesting that up to 30% of medications in circulation may be counterfeit (Blakeney, 2023). The proliferation of counterfeit drugs not only compromises patient safety but also undermines trust in the healthcare system and exacerbates health disparities. Disparities in healthcare access between rural and urban areas further compound medication access challenges in Nigeria. Rural communities often lack access to healthcare facilities and essential medications, forcing patients to travel long distances to seek medical care. Limited transportation infrastructure and high transportation costs further exacerbate disparities in medication access (Bhatia *et al.*, 2022). Weak regulatory frameworks and enforcement mechanisms contribute to medication access challenges in Nigeria. Regulatory agencies tasked with overseeing the pharmaceutical sector often lack resources, expertise, and enforcement capacity, allowing counterfeit drugs to infiltrate the market and compromising medication quality and safety.

Given these challenges, there is an urgent need for comprehensive assessments of medication access and distribution in Nigeria to identify gaps, opportunities, and potential solutions (Adebisi *et al.*, 2022). These assessments can provide valuable insights into the root causes of medication access challenges and inform evidence-based interventions to improve healthcare delivery and patient outcomes.

In recent years, there has been increasing recognition of the importance of addressing medication access and distribution challenges in Nigeria. International organizations, such as the World Health Organization (WHO) and the United Nations Office for Project Services (UNOPS), have partnered with the Nigerian government to support efforts to strengthen healthcare systems, enhance medication access, and combat counterfeit drugs (Chattu and Aslanyan, 2020). Moreover, there has been growing interest in leveraging innovative solutions, such as digital technologies and public-private partnerships, to improve medication access and distribution in Nigeria. Mobile health (mHealth) applications,

for example, have the potential to facilitate medication reminders, provide access to healthcare information, and enable telemedicine consultations, particularly in remote and underserved areas.

In conclusion, addressing medication access and distribution challenges in Nigeria requires a multi-faceted approach that addresses infrastructural limitations, regulatory deficiencies, and disparities in healthcare access (Abah, 2022). By conducting comprehensive assessments, leveraging innovative solutions, and fostering collaboration among stakeholders, Nigeria can overcome these challenges and build a stronger, more resilient healthcare system that ensures all citizens have access to the medications they need to lead healthy and productive lives.

3. Challenges in Medication Access and Distribution

Access to medications is a cornerstone of effective healthcare delivery, yet Nigeria grapples with numerous obstacles that hinder the efficient distribution of medications across the country (Shukla *et al.*, 2023). These challenges not only undermine public health but also exacerbate health disparities and impede efforts to improve overall healthcare outcomes. In this section, we delve into the multifaceted challenges surrounding medication access and distribution in Nigeria, ranging from infrastructural limitations to regulatory deficiencies.

Nigeria's vast geographical expanse is characterized by a network of roads that are often in a state of disrepair. Poor road infrastructure poses a significant barrier to the timely and efficient transportation of medications from distribution centers to healthcare facilities across the country (Weiss *et al.*, 2020). In rural and remote areas, where healthcare facilities are already scarce, impassable roads further exacerbate the challenge of medication delivery. As a result, patients in these areas may experience delays in receiving essential medications, leading to worsened health outcomes and increased morbidity rates. In addition to challenges in transportation, Nigeria faces constraints in storage facilities for medications. Many healthcare facilities, particularly in rural areas, lack adequate refrigeration and storage capacity to maintain the integrity and efficacy of medications, especially those that require specific temperature controls (Chukwu and Adib 2022.). This inadequacy in storage infrastructure not only compromises the quality of medications but also limits the variety of medications that healthcare facilities can stock, further exacerbating medication shortages and accessibility issues.

Counterfeit drugs represent a significant threat to public health in Nigeria, posing risks ranging from treatment failure to severe adverse effects and even death (Yakubu *et al.*, 2020). The proliferation of counterfeit medications is fueled by a combination of factors, including weak regulatory oversight, porous borders, and limited enforcement of intellectual property rights. These counterfeit medications often infiltrate the supply chain through illicit channels, bypassing regulatory checks and quality control measures. As a result, patients may unknowingly purchase and consume substandard or falsified medications, jeopardizing their health and undermining trust in the healthcare system. Addressing the scourge of counterfeit drugs requires concerted efforts from regulatory authorities, law enforcement agencies, and healthcare stakeholders to strengthen surveillance, enhance regulatory enforcement, and raise public awareness (Kataria and Gautam, 2022).

Disparities in access to medications between rural and urban areas compound existing inequities in healthcare delivery in Nigeria. Urban centers typically have better-equipped healthcare facilities and a more reliable supply of medications compared to rural and remote areas (Okoroafor *et al.*, 2021). Limited healthcare infrastructure, coupled with socioeconomic factors such as poverty and lack of transportation, further exacerbates the divide in medication access. Rural communities often face longer travel distances to access healthcare facilities, which may deter patients from seeking timely medical care or adhering to prescribed medication regimens. Addressing these disparities requires targeted interventions to improve healthcare infrastructure in rural areas, expand access to essential medications, and strengthen community-based healthcare delivery models (Willis *et al.*, 2021).

Weak regulatory frameworks and enforcement mechanisms contribute to the challenges surrounding medication access and distribution in Nigeria. Regulatory agencies tasked with overseeing the pharmaceutical sector often face resource constraints, bureaucratic inefficiencies, and instances of corruption, which hamper their ability to effectively regulate the market and ensure compliance with quality standards (Pourraz *et al.*, 2022; Oshioste *et al.*, 2023). Furthermore, gaps in regulatory enforcement allow unscrupulous actors to exploit loopholes in the system, facilitating the entry of counterfeit drugs and substandard medications into the market. Strengthening regulatory capacity, enhancing collaboration between regulatory agencies, and implementing stringent enforcement measures are essential to safeguarding the integrity of the pharmaceutical supply chain and protecting public health.

In conclusion, the challenges in medication access and distribution in Nigeria are multifaceted and require comprehensive strategies to address. From inadequate infrastructure and the proliferation of counterfeit drugs to

disparities in access between rural and urban areas and regulatory deficiencies, these challenges underscore the need for concerted efforts from policymakers, healthcare providers, regulatory agencies, and other stakeholders to improve medication access and distribution nationwide (Anoke *et al.*, 2023; Ge *et al.*, 2023). By addressing these challenges head-on and implementing targeted interventions, Nigeria can move closer to achieving its goal of ensuring equitable access to essential medications for all its citizens.

4. Opportunities for Improvement in Medication Access and Distribution in Nigeria

Amidst the challenges facing medication access and distribution in Nigeria, there exist promising opportunities for improvement (Udokwu *et al.*, 2023). Leveraging innovative strategies and collaborations can enhance the efficiency, transparency, and accessibility of medication delivery across the country. In this section, we explore key opportunities for improvement and outline actionable approaches to capitalize on them.

Mobile health (mHealth) applications have the potential to revolutionize medication access and distribution in Nigeria. These applications can facilitate medication reminders, provide access to healthcare information, and enable telemedicine consultations, particularly in remote and underserved areas where access to healthcare services is limited. By leveraging the widespread use of mobile phones in Nigeria, mHealth applications can empower patients to take control of their healthcare, improve medication adherence, and enhance communication between patients and healthcare providers (Onunka *et al.*, 2023; Raji *et al.*, 2023). Blockchain technology offers a promising solution for enhancing supply chain transparency and combating the proliferation of counterfeit drugs. By creating an immutable and transparent ledger of medication transactions, blockchain can enable stakeholders to track the journey of medications from manufacturer to end-user, ensuring authenticity and quality along the supply chain. Implementing blockchain-based solutions can help mitigate the risks associated with counterfeit medications, strengthen regulatory oversight, and restore trust in the pharmaceutical supply chain (Chang *et al.*, 2020).

Strengthening regulatory frameworks and enforcement mechanisms is essential to ensuring the safety, efficacy, and quality of medications in Nigeria. Regulatory agencies must be equipped with adequate resources, expertise, and authority to effectively oversee the pharmaceutical sector, enforce compliance with regulatory standards, and swiftly respond to violations (Hamill *et al.*, 2021; Okogwu *et al.*, 2023). Investing in capacity building, enhancing inter-agency coordination, and implementing risk-based regulatory approaches can enhance regulatory effectiveness and protect public health. Collaboration with international organizations, such as the World Health Organization (WHO) and the United Nations Office on Drugs and Crime (UNODC), can provide valuable support and expertise in strengthening regulatory frameworks and combating counterfeit drugs (Kanazawa, 2022; Ogunjobi *et al.*, 2023). By leveraging international partnerships, Nigeria can access technical assistance, capacity building programs, and best practices in regulatory enforcement, thereby enhancing the integrity of the pharmaceutical supply chain and promoting public health.

Public-private partnerships play a crucial role in improving medication access and distribution in Nigeria (Ahonkhai *et al.*, 2022). Collaborative efforts between government agencies, pharmaceutical companies, and healthcare providers can facilitate information sharing, resource mobilization, and coordinated action to address medication access challenges. By working together, stakeholders can leverage their respective strengths and expertise to develop innovative solutions, expand access to essential medications, and improve healthcare delivery nationwide (Okafor *et al.*, 2023). Engaging community organizations and non-governmental organizations (NGOs) is vital for reaching underserved populations and addressing medication access disparities at the grassroots level. Community-based organizations and NGOs can play a key role in raising awareness about medication access issues, providing support services to vulnerable populations, and advocating for policy changes to improve healthcare access (Nguyen *et al.*, 2021). By fostering partnerships with community organizations and NGOs, stakeholders can ensure that interventions are tailored to the unique needs of local communities and effectively address medication access challenges at the grassroots level (Gray *et al.*, 2021).

In conclusion, leveraging digital technologies, strengthening regulatory frameworks, and fostering public-private partnerships present promising opportunities for improving medication access and distribution in Nigeria (Ibeneme *et al.*, 2020). By embracing innovation, enhancing regulatory capacity, and fostering collaboration among stakeholders, Nigeria can overcome existing challenges and build a more resilient and equitable healthcare system that ensures all citizens have access to the medications they need to lead healthy and productive lives (Nwokolo *et al.*, 2023; Usman *et al.*, 2024).

5. Case Studies or Examples

One notable successful initiative in medication distribution in Nigeria is the "Last Mile Delivery" program implemented by the Nigerian Health Supply Chain (NHSC) (Kim *et al.*, 2020). This program focuses on improving the efficiency and reliability of medication delivery to the last mile, particularly in rural and hard-to-reach areas. Through the use of innovative distribution methods such as drone technology and mobile clinics, the NHSC has been able to overcome challenges related to poor road infrastructure and limited access to healthcare facilities, resulting in improved medication access and health outcomes in underserved communities (Harrington *et al.*, 2020).

The "Drug Revolving Fund (DRF)" initiative in Nigeria exemplifies collaborative efforts between stakeholders to improve medication access and distribution. Under this program, government agencies, pharmaceutical companies, healthcare providers, and community organizations collaborate to establish revolving funds that ensure a sustainable supply of essential medications at affordable prices (Pastakia *et al.*, 2020; Ma *et al.*, 2022). By pooling resources and expertise, stakeholders have been able to streamline medication procurement, distribution, and financing, thereby expanding access to essential medications and reducing out-of-pocket healthcare expenses for patients.

Nigeria can draw valuable lessons from countries such as India and Kenya, which have implemented successful strategies to address medication access and distribution challenges (Miller *et al.*, 2021). In India, the "Jan Aushadhi" program provides low-cost generic medications through a network of government-owned pharmacies, expanding access to essential medications for millions of people across the country. Similarly, Kenya's "Medicine Supply Chain Strengthening Project" focuses on improving the efficiency and transparency of medication distribution through the use of technology and capacity building initiatives. These examples highlight the importance of adopting a multifaceted approach that involves leveraging technology, strengthening regulatory frameworks, and fostering collaboration among stakeholders to improve medication access and distribution (Kasula, 2023; Tariq, 2024).

6. Future Outlook

The future outlook for medication access and distribution in Nigeria holds promise as stakeholders continue to innovate and collaborate to overcome existing challenges. With advancements in technology, such as the widespread adoption of mobile health applications and blockchain technology, opportunities for improving medication access and distribution are expanding (Dash *et al.*, 2021; Santos *et al.*, 2021). Moreover, the growing recognition of the importance of public-private partnerships and community engagement underscores the need for holistic approaches that address the root causes of medication access disparities.

Looking ahead, it is essential for Nigeria to prioritize investments in healthcare infrastructure, regulatory capacity building, and healthcare financing to sustainably improve medication access and distribution nationwide (Uzochukwu *et al.*, 2020). By learning from successful initiatives, fostering collaboration among stakeholders, and remaining committed to addressing medication access disparities, Nigeria can build a more resilient and equitable healthcare system that ensures all citizens have access to the medications they need to lead healthy and productive lives (Piotrowski *et al.*, 2023; Okunade *et al.*, 2023).

7. Conclusion and Recommendations

The assessment of medication access and distribution in Nigeria has highlighted several key challenges, including inadequate infrastructure, the proliferation of counterfeit drugs, disparities in access between rural and urban areas, and regulatory deficiencies. However, amidst these challenges lie promising opportunities for improvement, such as the utilization of digital technologies, strengthening regulatory frameworks, and fostering public-private partnerships. These opportunities present pathways to enhance the efficiency, transparency, and accessibility of medication distribution in Nigeria.

Addressing medication access and distribution challenges in Nigeria requires multifaceted interventions that tackle underlying issues from multiple angles. Improving infrastructure, enhancing regulatory oversight, leveraging technology, and fostering collaboration among stakeholders are essential components of a comprehensive approach to improving medication access and distribution. By embracing a multifaceted strategy, Nigeria can effectively address the root causes of medication access disparities and build a more resilient and equitable healthcare system.

As we conclude this assessment, it is imperative to issue a call to action for stakeholders across the public and private sectors to work together towards improving medication access and distribution in Nigeria. Addressing medication

access challenges requires collective action, collaboration, and sustained commitment from policymakers, regulatory agencies, healthcare providers, pharmaceutical companies, community organizations, and international partners. Stakeholders must prioritize investments in healthcare infrastructure, regulatory capacity building, and innovative solutions to overcome existing barriers and ensure equitable access to essential medications for all Nigerians.

In conclusion, improving medication access and distribution in Nigeria is essential for achieving better health outcomes and advancing overall socio-economic development. By addressing key challenges, capitalizing on opportunities for improvement, and embracing multifaceted interventions, Nigeria can build a stronger and more resilient healthcare system that ensures all citizens have access to the medications they need to lead healthy and productive lives. Now is the time for stakeholders to come together, collaborate, and take decisive action to improve medication access and distribution in Nigeria.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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