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Strengthening Nigeria's Health System for Dual Disease Burden: Integrating Diabetes and Infectious Disease Management in Primary Healthcare

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ABSTRACT

Nigeria faces a significant and evolving dual disease burden, characterized by the persistent prevalence of infectious diseases such as malaria, tuberculosis, and HIV/AIDS, alongside a rising incidence of non-communicable diseases (NCDs), particularly diabetes. This dual burden places immense pressure on the country's primary healthcare (PHC) system, which remains under-resourced and fragmented. This review examines strategies for strengthening Nigeria's health system to effectively integrate the management of both infectious diseases and diabetes within PHC settings. Key approaches include institutionalizing integrated care through policy reforms, expanding task-shifting frameworks, leveraging digital health technologies, and promoting community-based screening and health promotion. The review also highlights the importance of sustainable financing, multidisciplinary care teams, and robust health information systems to support evidence-based decision-making and continuous patient monitoring. Addressing systemic barriers and fostering community participation are critical to ensuring equitable, patient-centered care. Implementing these integrated strategies can enhance health outcomes, optimize resources, and build a resilient health system capable of responding to Nigeria's complex disease challenges.

Keywords: Nigeria, dual disease burden, primary healthcare, diabetes, infectious diseases, integrated care.

INTRODUCTION

Nigeria, Africa's most populous country with over 220 million people, faces a significant and evolving health challenge marked by a dual burden of disease. Historically, the Nigerian health system has focused predominantly on combating infectious diseases, which have consistently accounted for high morbidity and mortality rates [1]. Diseases such as malaria, tuberculosis, and HIV/AIDS remain leading causes of death, particularly among children and young adults, despite notable progress in public health interventions. Over the past few decades, however, the epidemiological landscape of the country has shifted, with non-communicable diseases (NCDs) such as diabetes mellitus, hypertension, cardiovascular disease, and cancers increasingly contributing to morbidity, disability, and premature death [2]. This duality, the coexistence of infectious diseases and NCDs, has placed enormous strain on an already under-resourced health system and demands a reorientation of healthcare delivery towards integrated and holistic care models [3].

The rise of non-communicable diseases in Nigeria is largely attributed to demographic and lifestyle transitions. Urbanization has altered dietary patterns, increased sedentary behaviors, and amplified exposure to environmental risk factors such as air pollution. Simultaneously, an aging population has contributed to the growing prevalence of chronic conditions [4]. Diabetes mellitus, in particular, has emerged as a significant public health concern. Recent estimates suggest that over 5 million adults in Nigeria are living with diabetes, and this number is projected to increase in the coming decades. Uncontrolled diabetes not only causes long-term complications such as

cardiovascular disease, nephropathy, and neuropathy but also compromises immune responses, making patients more vulnerable to infections [5].

Despite this rising burden of NCDs, infectious diseases continue to exert a profound impact. Malaria remains endemic, with children under five and pregnant women disproportionately affected. Tuberculosis persists as a leading cause of adult mortality, often compounded by HIV co-infection [6]. The HIV/AIDS epidemic, while partially mitigated by antiretroviral therapy, continues to challenge healthcare resources. The persistence of infectious diseases alongside a surge in NCDs epitomizes the "dual disease burden" phenomenon, a situation in which health systems must simultaneously respond to acute infectious threats and the chronic, long-term needs of patients with NCDs. The dual disease burden has profound implications for health system planning, resource allocation, and service delivery, particularly within primary healthcare (PHC), which forms the bedrock of Nigeria's health system [7].

Primary healthcare is envisioned as the first point of contact for individuals within the health system, providing preventive, promotive, curative, and rehabilitative services. PHC facilities are strategically positioned to deliver integrated care, including routine screening, early diagnosis, disease management, and health education. However, the potential of PHC to address the dual disease burden remains underutilized due to systemic challenges [8]. Fragmented service delivery, inadequate training of health workers, limited access to essential medicines and diagnostics, and insufficient coordination between different levels of care hinder the effective management of both infectious diseases and NCDs. Furthermore, the lack of integration between programs targeting infectious diseases and those addressing chronic conditions leads to inefficiencies, duplication of efforts, and suboptimal patient outcomes [9].

Given these challenges, there is an urgent need to strengthen Nigeria's health system by implementing integrated care approaches within primary healthcare. Integrated care involves the coordinated delivery of health services across disease types and levels of care, ensuring that patients receive comprehensive, continuous, and patient-centered services [10]. Examples include the simultaneous screening and management of diabetes in patients attending HIV clinics, using community health workers to deliver health education on both malaria prevention and lifestyle modifications, and leveraging digital health platforms to track patient outcomes across multiple conditions. Strengthening PHC to manage the dual disease burden can reduce disease progression, improve health outcomes, optimize resource utilization, and enhance equity in access to care [10].

Nigeria's dual disease burden presents multifaceted challenges to the health system. Despite considerable investments in vertical programs targeting infectious diseases and pilot initiatives for NCD management, health outcomes remain suboptimal. Patients with chronic conditions often experience delayed diagnosis, fragmented care, and limited follow-up, while infectious disease programs face persistent challenges in surveillance, treatment adherence, and outbreak management [11]. The absence of integrated service delivery models exacerbates these issues, leading to inefficient use of limited health resources and poor health outcomes. Moreover, the current health workforce is insufficiently trained to manage coexisting infectious and non-communicable conditions, particularly at the PHC level, where the majority of Nigerians seek care. Without strategic interventions to integrate care delivery, the dual disease burden will continue to strain Nigeria's health infrastructure, threaten patient safety, and undermine national health objectives, including those aligned with the Sustainable Development Goals (SDGs) [12].

The specific objectives of this study center on understanding and improving the management of Nigeria's dual disease burden, comprising both infectious diseases and non-communicable conditions like diabetes, within primary healthcare (PHC) systems. First, the study seeks to assess the current epidemiological burden of these diseases and their impact on population health, highlighting the growing challenge of coexisting chronic and infectious conditions. Second, it aims to evaluate existing integrated care models in PHC settings, identifying approaches that effectively combine management of both disease types. Third, the study explores innovative strategies, including task shifting, digital health technologies, and community-based interventions, which have the potential to enhance patient outcomes and service delivery. Fourth, it identifies barriers and facilitators to implementing integrated care in Nigerian PHC facilities, considering systemic, infrastructural, and human resource constraints. Finally, the study provides actionable recommendations for policymakers and healthcare practitioners to strengthen PHC services for dual disease management. By addressing these objectives, the study contributes to improving health outcomes through early detection, continuous care, and equitable access to services, particularly for underserved populations. It also informs evidence-based health system reforms and offers insights that are relevant to other low- and middle-income countries facing similar challenges.

The Dual Disease Burden in Nigeria

The health landscape in Nigeria is currently characterized by a dual disease burden, where the country grapples with the simultaneous challenges of infectious and chronic non-communicable diseases (NCDs). Traditionally,

communicable diseases such as malaria, HIV/AIDS, and tuberculosis have accounted for significant morbidity and mortality, exerting immense pressure on the healthcare system [13]. However, recent epidemiological trends indicate a rapid rise in chronic conditions, particularly diabetes, which now affects over 5% of the adult population, with a substantial proportion of cases remaining undiagnosed. This dual burden presents a complex public health challenge, as the coexistence of infectious and non-communicable diseases often leads to co-morbidities that exacerbate health outcomes. For instance, infections can complicate glycemic control in diabetic patients, while uncontrolled diabetes increases susceptibility to severe infections. Such interlinked disease dynamics strain already limited healthcare resources, complicate diagnosis, and hinder effective treatment and long-term management. Addressing these challenges requires a holistic, person-centered healthcare strategy that integrates prevention, early detection, and management of both infectious and chronic diseases [14]. Strengthening primary healthcare systems, promoting awareness, and enhancing access to diagnostics and treatment are critical steps toward mitigating the impact of this dual disease burden and improving overall population health in Nigeria.

Health System Reforms and Integrated Care Models

Health system reforms that prioritize integrated care models are crucial for improving health outcomes, particularly in the management of both diabetes and infectious diseases within primary healthcare (PHC) settings. Integrating services at the PHC level allows facilities to function as central hubs for preventive and curative care, where patients can receive diabetes screening alongside existing programs for infectious diseases like HIV and tuberculosis [15]. This approach not only enhances early detection but also reduces duplication of efforts and improves the overall patient experience by providing holistic care in a single setting. Addressing workforce shortages in Nigeria requires strategies such as task shifting, which delegates certain clinical responsibilities from physicians to nurses, community health extension workers (CHEWs), or trained lay providers. This, coupled with the establishment of multidisciplinary teams comprising nurses, nutritionists, pharmacists, and health educators, ensures that care is comprehensive, continuous, and patient-centered. Effective implementation also demands policy and governance reforms, where national health policies explicitly prioritize integrated chronic disease management [16]. Collaboration among the National Primary Health Care Development Agency (NPHCDA), the Federal Ministry of Health, and donor partners can facilitate unified frameworks, standardized protocols, and shared financing mechanisms that sustainably support the integration of services, ultimately strengthening Nigeria's health system resilience and improving population health outcomes [17].

Leveraging Digital Health Innovations

Digital health innovations are increasingly reshaping the landscape of primary healthcare, offering significant opportunities to improve the management of both diabetes and infectious diseases. At the forefront are Electronic Health Records (EHRs), which enable comprehensive longitudinal tracking of patients, ensuring continuity of care and facilitating seamless data sharing across healthcare facilities. This capability is crucial for monitoring chronic conditions like diabetes, where consistent follow-up and early detection of complications are essential, as well as for infectious disease management, where timely data exchange can support rapid response to outbreaks. Complementing EHRs, mobile health (mHealth) tools provide versatile platforms for patient engagement, offering educational resources, medication adherence reminders, and teleconsultation services [18]. These tools are particularly impactful in rural and underserved areas, where access to healthcare specialists is limited, helping bridge gaps in service delivery and empowering patients to take an active role in managing their health. Furthermore, the integration of digital technologies into systems like the District Health Information System (DHIS2) enhances real-time disease surveillance, enabling health authorities to detect emerging trends in comorbidities and infectious disease patterns. By leveraging data analytics, these platforms inform targeted interventions, optimize resource allocation, and ultimately strengthen public health responses at the community level.

Community-Based Screening and Health Promotion

Community-based screening and health promotion are pivotal components of integrated disease management, particularly in settings with high burdens of both infectious and non-communicable diseases. By bringing services directly to the community, early detection of conditions such as diabetes, malaria, and HIV becomes more feasible, enabling timely linkage to care and treatment. Outreach initiatives, including periodic screening programs and mobile health clinics, are especially effective in reaching underserved populations who may face geographic, financial, or social barriers to accessing health facilities [19]. Combining blood glucose testing with malaria or HIV testing campaigns not only maximizes resource utilization but also increases the likelihood of identifying comorbidities early, ultimately reducing morbidity and mortality. Complementing screening efforts, health education and behavior change initiatives are critical. Community health workers play a vital role in disseminating practical guidance on nutrition, physical activity, hygiene, and preventive measures, while also raising awareness about the interconnections between infections and metabolic disorders. Furthermore, establishing partnerships with local stakeholders, including traditional leaders, faith-based organizations, and non-governmental organizations, fosters

trust and encourages active community participation. Such collaborative approaches enhance program uptake, sustainability, and overall health outcomes, underscoring the importance of community engagement as a cornerstone of integrated disease prevention and management strategies [20].

Challenges and Barriers to Integration

Integration of health services, though widely recognized as a strategy to enhance efficiency and improve population health outcomes, faces multiple persistent challenges and barriers. One major obstacle is the weak infrastructure of primary health care (PHC) facilities, often compounded by inadequate funding, which limits their capacity to deliver comprehensive services effectively. Equally critical is the shortage of trained human resources; many health workers lack consistent training and professional development opportunities, undermining the quality and continuity of integrated care [21]. Additionally, the prevalence of vertical program structures, where initiatives focus narrowly on single diseases creates fragmentation, making it difficult to coordinate services across different health needs. Coordination challenges extend beyond program design to governance, as limited communication and collaboration between federal, state, and local health authorities further impede seamless integration. Beyond systemic issues, cultural norms and low literacy levels in some communities can hinder the acceptance and uptake of integrated health services, reducing their impact. Overcoming these barriers requires sustained political commitment, strategic capacity building, and targeted financial investment to strengthen health systems. By addressing these multidimensional challenges, countries can move toward more equitable, efficient, and patient-centered care that fully realizes the benefits of integrated health services [22].

Future Directions and Recommendations

Future directions for addressing Nigeria's dual disease burden, encompassing both communicable and non-communicable diseases, require a comprehensive, multi-level approach that integrates policy, technology, community engagement, and financing. A primary recommendation is the institutionalization of integrated care through national policy reforms and the strengthening of primary healthcare (PHC) service packages to ensure that care for multiple conditions is coordinated, accessible, and standardized. Expanding task-shifting frameworks, complemented by rigorous training and supervisory mechanisms, can optimize human resource utilization, particularly in underserved areas [23]. Investments in digital health infrastructure are also critical, enabling telemedicine services, real-time data integration, and remote patient monitoring, which collectively enhance care continuity and responsiveness. Sustainable financing mechanisms, including strategic public-private partnerships, are essential to maintain and scale integrated programs over the long term. Moreover, fostering community participation in the co-design and implementation of interventions ensures that programs are culturally appropriate, contextually relevant, and more likely to achieve local acceptance. Finally, strengthening health information systems is indispensable for generating high-quality data to inform evidence-based decision-making, track disease trends, and evaluate program outcomes [24]. Collectively, these strategies provide a roadmap for a resilient, responsive, and equitable health system capable of mitigating Nigeria's complex disease challenges.

CONCLUSION

In conclusion, addressing Nigeria's dual disease burden requires a transformative approach that strengthens primary healthcare while integrating the management of both infectious diseases and non-communicable conditions such as diabetes. The evidence underscores the urgent need for coordinated, patient-centered care models that combine prevention, early detection, and continuous management within accessible community and facility-based platforms. Leveraging task-shifting strategies, digital health technologies, and multidisciplinary care teams can optimize service delivery, enhance follow-up, and improve patient outcomes. Equally important is the engagement of communities in co-designing interventions, ensuring cultural relevance, acceptability, and sustainability. Strengthening health information systems and implementing supportive policy and financing frameworks will further enable data-driven decision-making and long-term program resilience. By adopting these integrated strategies, Nigeria can reduce disease progression, improve population health, and build a responsive and equitable health system capable of meeting the evolving challenges posed by the simultaneous burden of infectious and chronic diseases. These efforts are critical for achieving sustainable health outcomes and advancing national and global health objectives.

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