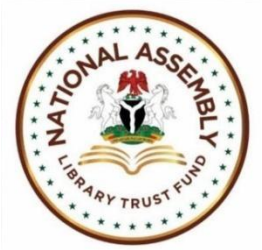

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RESEARCH DEPARTMENT

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TITLE:

STRENGTHENING BCG VACCINE POLICY FOR UNIVERSAL ACCESS IN NIGERIA: AN EVIDENCE-BASED FRAMEWORK FOR TUBERCULOSIS PREVENTION.

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BY

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Abstract

Tuberculosis remains a significant public health concern in Nigeria, making effective BCG vaccine delivery essential. This study examines the Bacillus Calmette-Guérin (BCG) vaccine as a critical public health intervention and explores its policy implications for Nigeria. Despite its inclusion in the National Immunisation Programme, challenges such as uneven coverage, inadequate cold chain systems, and weak governance continue to hinder universal access. Drawing on a qualitative policy review and stakeholder analysis, this paper develops an evidence-based policy framework to strengthen BCG delivery by improving governance, integrating primary health care (PHC), and engaging communities. The findings emphasise the need for an effective immunisation policy that guarantees equitable, sustainable, and universal access to BCG vaccination across all PHCs in Nigeria. Keywords: BCG vaccine, tuberculosis prevention, immunisation policy, primary health care, Nigeria.

1. 0 Introduction

The Bacillus Calmette-Guérin (BCG) vaccine remains the only available vaccine for tuberculosis (TB) prevention, providing substantial protection in children against severe forms of TB, such as meningitis and miliary tuberculosis (World Health Organisation [WHO], 2024). Nigeria accounts for approximately 4.5% of the global TB burden, ranking among the top ten high-burden countries globally (National Tuberculosis, Leprosy and Buruli Ulcer Control Programme [NTBLCP], 2023). Achieving universal BCG coverage is therefore critical to reducing TB morbidity and advancing progress toward Sustainable Development Goal 3 (SDG 3), which aims to ensure healthy lives and promote well-being for all. Despite its inclusion in Nigeria's Expanded Programme on Immunisation (EPI), BCG coverage remains inconsistent across states. Persistent gaps in policy enforcement, coordination, and community participation continue to impede equitable vaccine access. This study, therefore, explores the policy dimensions of BCG vaccine delivery and proposes an evidence-based framework to strengthen vaccine governance, enhance PHC integration, and improve community engagement toward universal BCG access.

1.1 Statement of the Problem

Although Nigeria has included the BCG vaccine in its routine immunisation schedule for decades, the country still faces significant implementation challenges. Coverage rates remain inconsistent across regions, with infrastructural gaps, weak governance, and persistent vaccine hesitancy affecting delivery. Inadequate cold-chain systems, workforce shortages, fragmented coordination across government tiers, and financial instability further undermine the programme's effectiveness. These systemic barriers limit equitable access to BCG and compromise national TB prevention efforts.

1.2 Justification of the Study

Tuberculosis remains a leading cause of childhood morbidity and mortality in Nigeria. Strengthening BCG vaccination is therefore essential not only for TB prevention but also for improving child survival outcomes. Understanding policy weaknesses and identifying strategic solutions is necessary to strengthen immunisation systems, ensure equitable vaccine access, and support Nigeria's progress toward SDG 3. This study provides evidence-based insights and practical recommendations to guide policymakers, health managers, and other public health partners.

1.3 Aim of the Study

To evaluate Nigeria's BCG vaccine delivery system and develop an evidence-based policy framework that strengthens governance, PHC integration, and community engagement for universal BCG access.

1.4 Specific Objectives

1. Evaluate the current state of BCG vaccine implementation within Nigeria's Primary Health Care (PHC) system, focusing on its policy structure and institutional effectiveness.

2. Identify and analyse the systemic and policy-related challenges hindering universal BCG coverage and equitable vaccine access.

3. Develop an evidence-based policy framework that strengthens vaccine governance, PHC integration, and community engagement for tuberculosis prevention.

4. Recommend actionable policy measures to enhance sustainable funding, coordination, and accountability in BCG vaccine delivery at all levels of government.

2.0 Literature Review

Globally, the BCG vaccine has been a cornerstone of TB prevention since its first use in 1921 (Fine, 2020). Evidence suggests that effective policy coordination and PHC integration play decisive roles in achieving high vaccination coverage. Countries such as Vietnam and Rwanda have attained over 90% BCG coverage through clear policy direction, consistent funding, and community-driven immunisation systems (UNICEF, 2023; WHO, 2024).

In contrast, Nigeria's BCG coverage averages 72%, with significant variation by region (National Primary Health Care Development Agency [NPHCDA], 2024). Studies by Afolabi et al. (2023) and Onwuemele (2023) highlight how weak governance structures, poor cold chain infrastructure, and inconsistent financing impede vaccine delivery. Furthermore, policy fragmentation and limited intergovernmental coordination reduce the effectiveness of national immunisation strategies. The literature underscores that strengthening vaccine governance and PHC systems through evidence-based policy interventions is essential for ensuring equitable and sustainable access to BCG vaccination.

3.0 **Methodology**

The study employed a qualitative policy analysis approach based on secondary data review and stakeholder assessment. Data were obtained from WHO, NPHCDA, and NTBLCP reports (2022-2024), as well as relevant peer-reviewed journals and institutional policy documents. Thematic analysis was used to identify key issues

surrounding BCG policy implementation, governance mechanisms, and PHC performance. The analysis centred on four major themes: policy coordination, health system infrastructure, funding, and community engagement.

4.0 Result/ Discussion/Analysis

The analysis reveals that Nigeria's BCG vaccine policy framework is comprehensive on paper but weak in practice. While the Expanded Programme on Immunisation (EPI) provides a structured approach for BCG delivery, operational challenges prevent universal access. The findings are discussed under six key thematic areas:

4.1 Governance Weakness

Coordination across federal, state, and local governments remains fragmented. Roles and responsibilities are often duplicated, while accountability mechanisms are weak. Delays in vaccine allocation and distribution occur because of unclear supervisory lines. For instance, in several states, state immunisation officers reported difficulties tracking vaccine stock from central stores to PHCs due to overlapping duties between state and LGA health authorities. Weak governance undermines planning, reduces efficiency, and increases inequities in BCG coverage, particularly in rural or hard-to-reach areas.

Implication: Without robust governance structures, policy intentions cannot translate into effective implementation.

4.2 Infrastructure Deficits

Adequate cold-chain systems are critical to maintain BCG potency. However, many PHCs suffer from inconsistent electricity supply, broken refrigerators, and inadequate vaccine transport. Studies show that some facilities in northern and southeastern Nigeria experience vaccine stockouts for weeks due to these infrastructural gaps. The lack of functional cold-chain monitoring systems increases the risk of administering compromised vaccines, thereby reducing efficacy and discouraging caregivers from returning for follow-up immunisation.

Implication: Infrastructure limitations directly threaten the quality and reliability of BCG services.

4.3 Funding Gaps

BCG vaccine programs rely heavily on donor funding from partners such as Gavi and UNICEF. Domestic funding is often delayed or insufficient, with budget allocations for routine maintenance, logistics, and personnel support frequently underfunded. Irregular financial flows result in interrupted vaccine supply, delayed supervision visits, and an inability to respond promptly to cold-chain breakdowns. The over-dependence on external donors raises sustainability concerns, as withdrawal of support could significantly disrupt vaccine delivery.

Implication: Long-term, predictable domestic funding is essential for sustaining high BCG coverage.

4.4 Human Resource Shortages

Many PHCs lack adequate numbers of trained vaccinators and data officers. High staff turnover, inadequate supervision, and limited training opportunities contribute to service quality gaps. For example, vaccinators often struggle with proper BCG administration and record-keeping, while supervisors may conduct only quarterly visits instead of monthly. This weakens both service delivery and data reliability, both of which are critical for program planning.

Implication: Strengthening human resource capacity at all levels is critical for effective vaccine delivery and accurate monitoring.

4.5 Community Awareness and Vaccine Hesitancy

Cultural myths, misinformation, and religious misconceptions reduce vaccine acceptance. Some caregivers delay or refuse BCG vaccination due to fears of side effects, misunderstanding of the vaccine's purpose, or reliance on traditional healing practices. Social mobilisation campaigns are often irregular or poorly targeted, failing to reach marginalised populations. Low trust in formal health systems compounds hesitancy, particularly in rural communities and urban slums.

Implication: Community engagement and consistent communication about behaviour change are vital to improving vaccine uptake.

4.6 Weak Monitoring and Data Systems

Accurate and timely data is essential for tracking vaccine coverage, identifying gaps, and informing decision-making. Current systems in many LGAs rely on paper-based records, which are prone to errors and delays. Inadequate reporting and poor data quality prevent timely interventions, such as replenishing stock or deploying outreach teams to low-coverage areas. Real-time digital monitoring is absent, mainly limiting the ability to respond effectively to emerging challenges.

Implication: Strengthening data management systems, including digital reporting and routine data audits, is crucial for accountability and improved outcomes.

Synthesis of Findings

Overall, the analysis indicates that while Nigeria has strong policy frameworks for BCG vaccination, operational challenges prevent effective implementation. Governance gaps, infrastructure deficits, funding instability, human resource shortages, low community awareness, and weak data systems interact to reduce BCG coverage and create inequities. Addressing these issues holistically through policy reforms, system strengthening, and community engagement is essential to achieve universal BCG access.

5. 0 Impact of the BCG Vaccine

1. Reduction in Childhood TB Mortality: BCG vaccination significantly decreases severe TB forms among children under five (WHO, 2023).

2. Enhanced Immune Response: It provides non-specific immune benefits, improving resistance to other infections (Netea et al., 2023).

3. Economic Impact: Reduced TB incidence lowers healthcare costs and boosts productivity.

4. Equity in Health Outcomes: Expanding BCG access supports national efforts to close health equity gaps.

6.0 Challenges Affecting BCG Policy Implementation in Nigeria

1. Weak Policy Enforcement and Coordination: Ambiguous institutional roles and weak oversight reduce accountability and slow implementation.

2. Inadequate Cold Chain and Logistics Systems: Many PHCs suffer frequent vaccine stockouts and poor storage due to unreliable power supply and insufficient infrastructure.

3. Human Resource Shortages: Limited trained vaccinators and irregular supervision undermine service quality.

4. Community Resistance and Vaccine Hesitancy: Cultural myths, misinformation, and religious misconceptions reduce public trust in immunisation programmes.

5. Funding Instability: Inconsistent financial support and overdependence on donor contributions affect vaccine procurement and logistics sustainability.

6. Weak Data and Monitoring Systems: Poor data quality and lack of real-time monitoring reduce transparency and make it challenging to evaluate programme performance.

7.0. Proposed BCG Vaccine Policy Framework

A Three-Pillar Policy Framework is proposed to enhance BCG vaccine delivery and ensure universal access:

1. Policy and Governance Strengthening

- Develop a standalone or revised immunisation policy emphasising measurable BCG coverage indicators.

- Clarify institutional responsibilities at federal, state, and local levels

- Introduce robust accountability mechanisms with digital data tracking and routine supervision

2. Health System Integration and Capacity Building;

- Strengthen PHC infrastructure, cold chain systems, and power supply reliability.

- Institutionalise training and capacity building for health workers.

- Integrate BCG services into maternal and child health programmes for broader coverage.

3. Community Engagement and Communication;

- Implement continuous behaviour change communication (BCC) and social mobilisation campaigns.

- Partner with traditional and faith leaders to promote vaccine acceptance.

- Develop community-based feedback and monitoring systems for transparency

8.0.Policy Recommendation

1. Institutionalise a National BCG Access and Accountability Strategy: The Federal Ministry of Health and National Primary Health Care Developmrnt Agency (NPHCDA) should establish a standardized monitoring and accountability mechanism to track BCG coverage and implementation outcomes.

2. Ensure Sustainable Funding and Infrastructure Support: Government budgets should include dedicated allocations for cold chain maintenance, logistics, and PHC facility upgrades

3. Enhance Stakeholder Coordination: Strengthen collaboration between federal, state, and local authorities, supported by technical partners, to streamline implementation.

4. Invest in Capacity Building: Regular professional training for vaccinators and data officers should be institutionalised at all PHC levels.

5. Sustain Community Mobilisation Efforts: Long-term health promotion and public education campaigns should target vaccine confidence, especially in underserved regions.

9.0. Limitations of the Study

This study relied on secondary data, which may not capture ongoing local interventions or regional variations. Future research should incorporate field studies and mixed-method assessments to measure the real-time impact of BCG policy reforms.

10.0 Conclusion

The BCG vaccine remains central to tuberculosis prevention and health equity in Nigeria. Although the EPI has improved immunisation access, systemic gaps in policy execution, funding, and coordination persist. Strengthening the BCG policy through an evidence-based framework that promotes governance, integration, and community participation is vital for achieving universal coverage. Implementing these policy measures will enhance national immunisation performance, reduce TB morbidity and mortality, and accelerate Nigeria's progress toward SDG 3.

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