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National Emergency Routine Immunization Coordinating Centre an emergency response to address routine immunization gaps in Nigeria: a mixed-method retrospective study

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Abstract

Background.

Immunization plays an important role in preventing millions of deaths globally. Yet Nigeria faces persistent challenges in achieving sub-optimal coverage. To address these challenges, Nigerian established the National Emergency Routine Immunization Coordination Center (NERICC), aimed at enhancing routine immunization coverage and address the systematic challenges. This study describes the establishment, organizational structure, and operations of NERICC. It also attempts to describe the specific intervention initiated by NERICC to bolster, as well as describe RI performance before and after the establishment of NERICC.

Methods.

We conducted a mixed-method retrospective study by analyzing. secondary data as NERICC reports and routine immunization administrative performance metrics for 18-NERICC prioritized states. Qualitative insights were triangulated with quantitative trends to assess routine immunization I coverage before and after NERICC's establishment.

Results.

An analysis of the multi-indicator coverage survey/national immunization coverage survey 2016 and 2021, showed there was a 51% increase in average penta3 coverage in NERICC priority states from 2016 to 2021 with 94% of states achieving 20% or more increase and 44% states had 50% or more increase in penta3 coverage.

Conclusion.

NERICC could have contributed to strengthening routine immunization systems and improving immunization coverage in Nigeria through coordinated, evidence-based, and innovative interventions. Sustaining these gains will require continued investment in leadership, financing, health system strengthening, and data-driven decision-making to achieve equitable immunization coverage and reduce the number of zero-dose children.

1. Introduction

Immunization, a key component of primary health care, stands as a pivotal force in preventing about 3.5 to 5 million deaths annually from vaccine-preventable diseases (VPDs) globally [1–3]. Its significance in public health extends beyond individual overall protection but also encompasses community wellbeing and global health security [4, 5]. Despite the notable progress made since the introduction of the global

expanded program for immunization program in 1974, challenges in routine immunization coverage persist, particularly in low and middle-income countries like Nigeria, as evident in the decline of Penta 3 coverage from 52% in 2014 to 33% in 2016 [6–9]. These gaps not only pose a problem to the health of the individuals and community but also impede the strides and progress made in achieving global immunization goals.

To address the persistent gaps and challenges in immunization, low and medium-income countries, including Nigeria have implemented significant reforms to revamp their immunization system, leveraging proven strategies and best practices to enhance the effectiveness of their immunization program [4, 8, 10]. In Afghanistan, the government in 2015 adopted the community-based vaccination initiative to prioritize immunization in conflict-affected regions employing female mobilizers vaccinators (FMVs), who are trusted members of the community to vaccinate children and educate women about health issues [11]. Building on this approach, Afghanistan enhanced immunization coverage by integrating Polio eradication efforts with routine immunization efforts [12, 13]. In Pakistan, mobile health campaigns, where audio messages using artificial intelligence platforms send out messages via SMS and Integrated Voice Recordings to caregivers, encouraging them to vaccinate their children [14].

Ethiopia launched the Health Extension Program (HEP) in 2003 to train health extension workers to provide essential health services including immunization. In 2018, the country implemented the Enhanced Routine Immunization Activities (ERIA), which employed a data-driven approach to identify Zero Dose Children, especially in underserved communities to reduce the gap in immunization coverage [15, 16]. The success of these initiatives is largely driven by partnership and collaboration with organizations such as the World Health Organization (WHO), UNICEF, Gavi, and other development partners. These collaborations have been instrumental in aligning and harmonizing efforts, facilitating the sharing of best practices, and enhancing expertise, leading to the utilization of innovative tools such as data analytics, capacity building, and strengthening immunization supply chain and logistics.

A successful routine immunization program requires the organized integration of various program elements such as acquiring vaccines and ensuring their efficient delivery to the last mile, while maintaining an operational cold chain and generating demand for these services. comprehensive training of health workers vaccine handling, administration and record keeping, as well as creating community awareness and demand for vaccination are important components. Political support, sustainable funding, continuous monitoring and evaluation, and the utilization of high-quality data are also crucial for program success [17, 18].

Nigeria has made a concerted effort to revamp routine immunization and ensure that no child is left behind in the immunization process [4, 19]. Nigeria introduced the Expanded Programme on Immunization in 1978, to provide comprehensive immunization services to children under the age of two. With initial success, but faced declining coverage over the years, especially in the 1990s and 2000s [4, 20]. The Government introduced the National Strategic Health Development Plan (NSHDP) in 2010, with emphasis on immunization in the country with minimal success [15].

Despite these efforts, challenges and gaps still exist, with Nigerians facing a particularly alarming situation with an estimated very high number of zero-dose children. Zero-dose children are children who have never received any dose of routine immunization vaccine. The 2016 MICS/NICS report indicated that with a national coverage of 33% for penta 3, over 4.3 million children were unvaccinated despite clear evidence of available vaccines in Nigeria. Only Lagos state had 80% coverage of Penta 3, 15 states and FCT had between 50%-79.9% Penta 3 coverage,19 states had less than 50% penta 3 coverage of which four states had less than 10% Penta 3 coverage with Sokoto having the least coverage of 3% [21–23]. These challenges, as discussed in various literature includes vaccine hesitancy, shortage of human resources for health and commodities at service points, social barriers to accessing service [20, 24–26]. There are also challenges that are related to fragmented coordination, gaps in microplanning and denominator figures, constraints in data management, reduced EPI budgeting resulting in funding shortfall, weak advocacy, and high-level support due to competing priorities, and poor service delivery strategies [21, 27]. Additionally, there are observed disparities in administrative immunization data and survey data.

Acknowledging the critical need to address these immunization gaps, the Nigerian government declared a state of emergency on routine immunization in 2017. This led to the establishment of the National Emergency Routine Immunization Coordination Center (NERICC) at the national, state, and local government levels. The establishment of NERICC marked a paradigm shift in the country's approach to immunization, elevating it to a top priority of the government in healthcare provision and establishing it as a national coordination center, alongside its state and the LGA counterparts. NERICC serves as the hub for strategic planning, leadership, and the identification of innovative strategies that emphasize emergencies to enhance vaccination coverage and address the systemic challenges inherent in Nigeria's immunization efforts (NSIPSS, 2021).

Since its establishment, NERICC has implemented various innovative interventions that have significantly improved immunization coverage rates, enhanced program implementation, and a drastic reduction in the burden of vaccine-preventable diseases. However, despite his achievements, there is a noticeable gap in the literature regarding the efforts of NERICC. This study aims to address this gap by providing a comprehensive overview of the NERICC establishment, organizational structure, and its operations. The study also aimed to describe specific interventions initiated by NERICC to bolster RI in identified low-performing states, and the trends in RI outcomes in these states before and after the establishment of NERICC for the period 2016 to 2013.

2. Material and methods

2.1. Study design

This is a descriptive study that integrates qualitative data from a desk review of routine immunization documents and reports with quantitative data analysis of routine immunization performance metrics from District Health Information Software 2 (DHIS2) and Short Message Service (SMS) platforms, to

describe the establishment, architecture, and operations of National Emergency Routine Immunization Coordinating Centre (NERICC), its specific interventions initiated to bolster routine immunization (RI) in the identified low-performing states. We also analyzed the routine immunization performance before and after the establishment of the NERICC using the data from the Multiple Indicator Cluster Survey/ National Immunization Coverage Survey (MICS-NICs), Programme Assessment for Performance Management & Action Lot Quality Sampling (PAPA-LQAS), and routine immunization administration data 2016 to 2023.

2.2. Study Setting

Our study focused primarily NERICC interventions carried out at national level and in the 18 NERICC high-priority states in Nigeria. The NERICC was a strategic approach to improve the efficiency of routine immunization programs with a focus on emergency and innovative interventions in recognition of the pressing need to increase vaccination coverage. The government and partners in Nigeria had grown concerned about their low return on investment in RI owing to the poor MICS/NICS report of 2016. On June 17th, 2017, a call to action in routine immunization was proclaimed as a state of emergency, and a public health concern was declared on RI to quickly address the downward trend of vaccination in, protecting the well-being of Nigerians with a sense of urgency using innovative approaches. NERICC as a coordinating body was inaugurated on July 4th, 2017, to coordinate this national response.

The Establishment of NERICC hinged on the coordination of programs and response to emergencies in its management which was crucial for vaccination coverage performance. A significant achievement was made through optimizing resource allocation, reducing duplication of efforts, data sharing and monitoring, emergency preparedness and response, capacity building, community engagement, financial management, and accountability. NERICC, being inaugurated, met daily to review RI challenges and discuss solutions for effective implementation.

The 2016 MICS/NICS, gave birth to the development of the Nigeria Strategy for Immunization and Primary Health Care System Strengthening (NSIPSS) 2018–2028. This strategic document informed the categorization of states using Penta 3 coverage and became the rallying point for a renewed engagement with local and international partners, including Gavi, the Vaccine Alliance. The NSIPSS provides a comprehensive roadmap for driving innovations at both national and sub-national levels, with the ambitious goal of achieving the highest possible immunization coverage. The coverage performance is categorized into five distinct levels: High Category, representing coverage between 60% and 80%; Medium Category, encompassing coverage from 30% to 59%; Low 3 Category, ranging from 20% to 29%; Low 2 Category, covering 10% to 19%; and Low 1 Category, which reflects coverage below 10% (0% to 9%). These categories serve as a framework for targeting improvements and addressing disparities in immunization efforts. It reflected the joint agreement with the Government and Partners to mount an extraordinary effort to reach every child with life-saving vaccines in the country.

The NSIPSS categorization was used to inform the selection of states into different categories for targeted interventions. Eleven States were categorized as very low performing, seven States as low

performing and nine States as high performing. The very low performing and the low performing States constitute the 18 NERICC priority Phase 1 States for implementation of NERICC innovations/interventions across all their LGAs (Fig. 1). However, the remaining 18 non-NERICC states and FCT, that were good performing, maintained routine activities to deliver immunization services.

In this study we did a trends analysis of routine immunization performance in the low-performing states (NERICC high priority) before (2016) and after (2023) the establishment of NERICC to understand the effect of the interventions.

2.3. Data Source

The data sources we analyzed were the NERICC operational and strategy documents such as the NERICC starter pack, the Nigeria Strategy for Immunization and Primary Health Care System Strengthening (NSIPSS) 2018–2028, NSIPSS 2.0 (2021–2024), NERICC Activity Reports, and Operational Strategies and Guidelines (2021–2024). We also carried out a secondary quantitative analysis of various immunization data including the Nigeria Multiple Indicator Cluster Survey-National Immunization Coverage Survey (MICS-NICS) report of 2016 and 2021, the Nigeria PAPA-LQAS 2017–2023, and Routine immunization performance administrative data for children 0–23 months on the DHIS 2.0 2016–2023 and the RI-SMS 2018–2023.

2.4. Data Analysis

To assess the effect of NERICC intervention on routine immunization performance Nigeria, we first described the establishment, organogram, and operation of NERICC along the thematic areas of leadership and coordination, service delivery, surveillance, advocacy, communication, and social mobilization (ACSM), data, logistics, and finance from the inception year 2017 to 2023. This allows us to understand the structure and function of NERICC. A deep dive was conducted on the problems affecting routine immunization and the interventions implemented by NERICC between 2017 to 2023. This analysis is to identify problems and challenges in immunization in the country and assess the effectiveness of NERICC intervention in addressing these issues. We then analyzed routine immunization performance using Penta 1 and 3 coverage in the low-performing states and Local Government Areas from 2016 to 2023, using data from the District Health Information System 2 (DHIS2) and Routine Immunization Short Message Services (RI-SMS) platforms. This aim is to evaluate the impact of NERICC's interventions on improving immunization coverage in Nigeria.

2.5. Ethical Implication

In this study, we used government publicly available de-identifiable administrative data hence ethical approval was not requested.

3. Results

3.1. NERICC Organogram and Operations

3.1.1. Leadership Management (Operations, Data, Finance)

The NERICC is headed by a Program Manager (PM). The PM oversees the operations of the NERICC. NERICC has three (3) thematic groups, each led by a Deputy Program Manager (Fig. 2). The Program Manager oversees the overall program operations of NERICC, playing a vital role in revitalizing routine immunization programs across the country. The NERICC team focuses on addressing gaps, and bottlenecks and implementing innovative strategies to enhance the country's vaccination coverage, particularly in underperforming states. In collaboration with immunization stakeholders at various levels, the program manager leverages data-driven insights and informed decision-making to drive actionable improvements, hereby ensuring the seamless execution of strategies. The NERICC operations team facilitates the translation of recommendations into tangible plans that boost immunization coverage. The data team, operating under the leadership of a deputy program manager, is central to these efforts, focusing on improving the accuracy, quality, and timeliness of immunization data. Beyond improving data quality, the team analyzes data to generate actionable insight, directly informing strategies to enhance immunization outcomes.

The performance management area focuses on establishing a robust monitoring framework and early warning systems within the NERICC. Their primary aim is to establish a monitoring system to track the implementation of strategies and innovations introduced by NERICC and implementation of activities on the NERICC work plan. The team is tasked with developing an accountability framework, which is used to measure and assess the outcome of NERICC's activities and initiatives (Fig. 2).

3.1.2 Service Delivery (SD) and Logistics

The Service Delivery thematic area, overseen by Deputy Program Manager II, is responsible for operationalizing the Reaching Every Ward (REW) plan across NERICC priority states, with a particular focus on optimizing this process. Under the REW framework, the service delivery team designs and implements service delivery strategies, ensuring no eligible child is missed during immunization efforts. The Service Delivery team also conducts a thorough review of all documents related to the Expanded Program on Immunization (EPI) capacity building, ensuring compliance and addressing identified gaps in RI coverage. The approach emphasizes the use of evidence-based and capacity-strengthening methods to foster knowledge retention among healthcare personnel. The team is also tasked with strengthening the RI Supportive Supervision (RISS) process to enhance the quality of RI supervision throughout the country. Feedback from RISS exercise has been used to influence program reviews, enabling adjustments to improve service delivery standards and develop strategic interventions. Finally, the service delivery team is tasked to work with the national logistic working group to ensure vaccine accountability and strengthen logistics and cold chain systems to support the implementation of NERICC interventions to increase Vaccine coverage.

3.1.3 Advocacy, Communication & Social Mobilization (ACSM)

The Advocacy, Communication and Social Mobilization (ACSM) thematic area is led by the Deputy Program Manager. The ACSM team focuses on devising and implementing strategies to enhance immunization, communication and advocacy. Their primary responsibility involves identifying states requiring advocacy and advising management on conducting targeted advocacy efforts. This team interfaces with other departments and government agencies on issues concerning RI demand generation and plays a pivotal role in reactivating Ward Development Committees and community engagement committees at the subnational level. Additionally, they collaborate with the Community Health Influencers, Promoters, and Services (CHIPS) team to amplify community engagement and stimulate demand for immunization services.

NERICC boasts an administrative and secretariat support team tasked with coordinating all administrative logistics for NERICC activities under the guidance of the NERICC Program Manager. This team ensures the smooth functioning of administrative aspects, streamlining operational logistics, and providing crucial support for the effective execution of NERICC's initiatives and objectives. Their efforts bolster the operational efficiency and organizational effectiveness of NERICC's overarching immunization strategies in Nigeria.

3.1.4 State Emergency Routine Immunization Coordination Centre (SERICC) and Local Emergency Routine Immunization Coordination Centre (LERICC)

The launch of SERICCs and LERICCs was structured to replicate the coordinating function of the NERICC at the State and LGA levels. It staggered, prioritizing states falling under "low 1 and low 2" categories to initially deploy NERICC innovative strategies. This decision provided a learning ground for state-level personnel to understand NERICC operations. After a state inaugurated its SERICCs, NERICC Monitoring & Accountability officers were promptly sent to the state to transition the SERICC management team following 2–3 weeks of training and mentoring. The SERICCs are headed by the program manager (PM) while the LERICCs are headed by the RI Officer (RIO) (Figs. 3 and 4).

The selection process for SERICC PMs and LERICC RIOs involved a competitive process to support immunization strategies for impactful coverage improvements in states and LGAs, respectively. Preferably, candidates were SPHCDA staff with a minimum of 3 years of experience in immunization and the PHC program workspace. Qualifications included a background in biological sciences, nursing, or related fields and strong interpersonal, communication, and computer skills.

3.2 NERICC interventions to bolster routine immunization (RI) in identified low-performing states

The specific interventions initiated by NERICC to bolster routine immunization (RI) in the prioritized low-performing states are summarized in the theory of change (Fig. 5).

The theory of change driving the NSIPSS 2.0 (2021/24) is rooted in a reviewed set of strategies and interventions from the NSIPSS 2018–2028, spanning 6 key thematic areas. These approaches are designed for targeted implementation, particularly in states, LGAs, and communities with a significant population of unimmunized children. These strategies and interventions are specifically tailored to confront the recognized challenges head-on. Simultaneously, a careful emphasis is placed on establishing critical enablers, such as functional leadership and coordination platforms, optimized integration, and robust accountability measures. The overarching objective is to attain 90% immunization coverage (NSIPSS 2.0), ensuring a comprehensive and effective response to the pressing issues within the immunization landscape.

The challenges and gaps identified fall under the categories of Sustainable Financing, Leadership Management and Coordination, Immunization Service Delivery, Demand Creation, Data Management and Innovation, and Human Resource and Institutional Capacity. The challenges identified were largely around sub-optimal leadership, planning & weak coordination at the sub-national and LGA levels, weak planning at the PHC levels – REW Micro plans and a high number of unimmunized and Zero dose children, poor communities' participation on health-related issues to drive demand for PHC services, sub-optimal engagement of communities on demand for RI-PHC services, poor data quality and sub-optimal use of data at the Sub-national and LGA level, sub-optimal last mile delivery of vaccines to the end-user resulting to frequent stock-out, weak capacity of the available HRH and poor accountability.

The innovative strategies deployed were designed to address the identified challenges comprehensively, utilizing a multi-pronged approach. These strategic interventions, backed by enablers such as external support, policy reforms, and effective leadership, aimed to address the root causes of the identified challenges. The sub-section below highlights the strategies deployed across thematic areas to improve RI coverage rates across identified low-performing states.

3.2.2 Leadership Management and Coordination (LMC)

LMC efforts within the NERICC involve several strategic initiatives aimed at optimizing routine immunization outcomes across national, state, and LGA levels. The establishment and strengthening of National, State, and Local Government Area Emergency Routine Immunization Coordination Centers (NERICC/SERICC/LERICC) serve as key pillars in coordinating immunization activities at various administrative levels. Regular virtual joint meetings were convened by the NERICC alongside the SERICCs and LERICCs to assess and monitor the progress of their tailored strategies. These strategies were specifically designed to enhance RI outcomes, ensuring a coordinated and effective approach at the national, state, and local levels. Additionally, collaborative leadership efforts were facilitated through engagement with other strategic groups like the COVID-19 Strategy Group (SG), which leveraged collective expertise and resources to address the challenges posed by the ongoing pandemic and its impact on RI.

The implementation of the Primary Health Care Under One Roof (PHCUOR) policy was a pivotal step toward consolidating various health services, including immunization, under a unified management structure. This approach fostered better coordination and integration of healthcare services. Furthermore, to enhance leadership and management, an accountability framework has been developed and is being implemented in some states. This framework serves as a guide for responsible and effective leadership, ensuring that stakeholders at all levels are accountable for their roles and contributions to the success of RI initiatives.

3.2.3 Sustainable Financing

In the pursuit of sustainable financing, various avenues were explored in the NERICC. One approach involves leveraging the Basic Health Care Provision Fund (BHCPF) to secure sustained financial support. Additionally, the IMPACT initiative was utilized to access additional financial resources. Another avenue under consideration is seeking support from the GAVI Health System Strengthening (HSS) program. These efforts collectively aimed to establish and maintain financial sustainability for the specified initiatives.

3.2.4 Immunization Service Delivery

3.2.4.1 Optimized Integrated Routine Immunization Sessions (OIRIS)

The development of Optimized Integrated Routine Immunization Sessions (OIRIS) was a strategic initiative aimed at instilling a sense of urgency within the Routine Immunization domain. This approach included extending service hours to evenings and weekends, while also integrating RI with a variety of Primary Health Care (PHC) services and commodities.

The evolution into Optimized Integrated Reproductive, Maternal, Newborn, Child & Adolescent Health + Nutrition and Immunization Sessions (OIRMCANIS) represented a shift toward a more holistic health strategy. This transformation ensured a comprehensive focus on broader health dimensions, extending beyond routine immunization to address the overall well-being of caregivers and their families. Furthermore, the implementation of Daily Fixed Sessions (DFS) at tertiary facilities, secondary facilities, and urban Primary Health Care Centres (PHCCs), coupled with weekly outreach sessions at all health facilities, significantly enhanced service delivery and accessibility, ensuring that essential health services reached underserved and marginalized populations.

In addition, monthly supportive supervision of OIRIS sessions by personnel from the National Emergency Routine Immunization Coordination Centre (NERICC) was instituted. This supervision plays a crucial role in fostering engagement, strengthening accountability, and driving results. It ensures that the delivery of health services remains efficient, effective, and aligned with national health objectives, further solidifying the impact of OIRIS on public health outcomes.

3.2.4.2 Supply chain and logistics

To further bolster immunization efforts, initiatives were undertaken to enhance the supply chain and logistics. Programs like push-plus and the Cold Chain Equipment Optimization Plan (CCEOP) were implemented, along with the adoption of the Open-LMIS solution for improved logistics management. System redesign, such as the Three-Hub storage system, was introduced, along with strategies for vaccine and device waste management and cold chain maintenance.

3.2.4.3 Optimization of Routine Immunization Supportive Supervision (RISS)

The optimization of Routine Immunization Supportive Supervision (RISS) was prioritized to ensure that supervisory processes were streamlined and effective to ensure that quarterly RISS plans were focused and targeted ensuring that all health facilities in an LGA were visited in a data focused and driven supporting supervision using electronic platforms to track and monitor the conduct of these visits and follow up on pending actions. Strategies like the Reaching Every Ward (REW) microplans are monitored for efficient planning and implementation. This supportive supervision is conducted by the NERICC personnel.

The supportive supervision under the Optimized Integrated Reproductive, Maternal, Newborn, Child & Adolescent Health + Nutrition and Immunization Sessions (OIRIS) has achieved significant progress in enhancing immunization services and advancing public health goals. Conducted monthly by the National Emergency Routine Immunization Coordination Centre (NERICC), this initiative has improved service quality, accountability, and effectiveness at all levels of routine immunization (RI) delivery.

Through strict adherence to standards and protocols, supportive supervision has elevated the quality of RI services while fostering a culture of accountability among health workers. On-the-spot mentoring and problem-solving during supervisory visits have strengthened workforce engagement, addressed challenges and enhanced motivation. Additionally, these visits have ensured greater data accuracy and reporting reliability, enabling evidence-based decision-making and more efficient resource allocation.

Supportive supervision has also played a critical role in expanding immunization coverage by addressing service delivery gaps, optimizing outreach strategies, and strengthening community mobilization efforts to reach underserved populations. Furthermore, it has served as a platform for capacity building, equipping health workers with the skills necessary to sustain improvements and tackle emerging challenges.

By driving a results-oriented approach, supportive supervision has reinforced a focus on measurable outcomes, ensuring impactful interventions aligned with national health priorities. This initiative has become integral to the success of OIRIS, significantly improving the quality and reach of immunization and integrated health services across the country

3.2.4.4 Integrated Medical Outreach Program (IMOP)

The IMOP strategy was devised to respond to the anticipated worsening in RI in 333 LGAs in Nigeria following the impact that the COVID-19 pandemic had on the poor RI and maternal & child health indicators in the country. IMOP was implemented as an integrated medical outreach to address the health needs of communities while providing RI and PHC services. A remarkable milestone was reached, with 70% monthly coverage of penta3 for children 12–23 months was achieved within the first week of IMOP implementation alone in October 2020 in 333 LGAs where the IMOP was implemented (Fig. 6). IMOP provided a platform to reach missed children in line with the strategy of leaving no one behind.

3.2.4.5 Optimized Outreach Strategy

The Optimized outreach strategy (OOS) was developed by NERICC to enhance the conduct of quality outreach sessions by bringing services closest to the people and providing access to immunization for optimal output. This was borne out of the fact that administrative data had shown suboptimal conduct of RI sessions especially outreaches with only 48% of health facilities reporting the conduct of outreach session in 2022, and where conducted, these outreach sessions were inefficient and ineffective, only reaching an average of 5 children reached per outreach session. Bringing these services closer to the people with adequate planning, mobilization and integration with other services was seen as a necessity to optimizing outreach sessions. OOS was implemented in two states (Zamfara and Katsina) for just a month to improve access and reduce missed children and communities. A total of 655 and 464 children 0–59 months were reached in one month during the integrated outreaches in Katisina and Zamfara States respectively.

The implementation of OOS led to an improvement in the average number of children reached in an outreach session across both states. Other strategies were implemented to address immunization gaps, and in line with the immunization agenda IA 2030, to Identify, Reach, Measure & Monitor, and Advocate (IRMMA) zero dose children, particularly the zero dose reduction strategies. Additionally, the New Vaccines Introductions (NVI), covering vaccines such as PCV, PCV-Switch, IPV, Rota, and HPV, were implemented to expand and improve immunization service delivery. These initiatives collectively form a comprehensive strategy to strengthen and optimize immunization services within the broader framework of Primary Health Care.

3.2.5 Demand Generation

Demand generation strategies encompass several key approaches. Among them were activities such as; advocacy and targeted stakeholder engagement which involves engaging in advocacy efforts and targeted interactions with stakeholders to garner support and awareness, fostering community engagement and ownership in the implementation of the Community Engagement Strategy (CES) in various states, ensuring active participation, implementation of Social Mobilization and Behavior Change Communication (SMBCC) Initiatives that ensures the execution of initiatives focused on social mobilization and behaviour change communication to encourage positive health-related behaviours within the community, utilizing reminders and communication strategies to actively drive and sustain demand for the services or products in question, etc.

3.2.6 Data Management and Innovation

In the realm of Data Management and Innovation, several initiatives were put into action. The implementation of the Data Quality Improvement Plan (DQIP) to enhance the accuracy and reliability of data was given top priority. The SMS reporting of RI data was introduced to obtain real time data across the 18 phase 1 states, contributing to a more responsive and data-driven health management system.

Additionally, strides are being made with the introduction of the Electronic Management of Immunization Data (EMID) for routine immunization. DQIP Efforts extended to the deployment of the PAPA-LQAS, which encompasses assessments for RI, Reproductive, Maternal, Newborn, and Child Health (RMNCH), as well as Malaria performance on a quality basis. This holistic approach ensures a comprehensive evaluation of various health indicators and the quality of RI for data driven decisions.

3.2.7 Human Resource and Institutional Capacity

In the domain of Human Resource and Institutional Capacity, a series of initiatives were undertaken. Firstly, there was an effort to update the school curriculum to align with current educational needs and advancements. Additionally, a strategy involving peer-led learning was being facilitated to enhance collaborative and interactive knowledge-sharing among individuals within the community.

The introduction of the Immunization Academy (IA) to the system was a platform that served as a central hub for education and training, aiming to bolster the expertise and capabilities of individuals involved in immunization efforts. Health workers were encouraged to enroll in IA courses and learn from peers from other countries. The combination of these efforts underscores a comprehensive approach to strengthening human resources and institutional capacity in the context of health and education.

An assessment of knowledge and perceptions of health workers regarding eLearning, aiming to identify factors influencing the adoption of the IA, was conducted in January 2020 in 2 states (Kano and Lagos). A baseline assessment in Kano and Lagos States was done in July 2020 (n = 36 health facilities) and an endline evaluation was carried out in Kano and Lagos States in December 2021 (n = 36 health facilities). Findings at endline revealed a 17% (79–95%) and 8% (79–87%) increase in knowledge compared to the baseline amongst participants in Kano and Lagos respectively.

3.3 Routine immunization performance in the low-performing states before and after NERICC establishment

The MICs/NICs average Penta3 coverage for the 18 NERICC priority states was 24% in 2016 and 54% in 2021. There was a 51% increase in penta3 from 2016 to 2021. All the NERICC states recorded an improvement in immunization coverage except Borno states had a decline in coverage in 2021 when compared to 2016 MICS.NICS. Seventeen out of eighteen (94%) of NERICC states had 20% or more increase in penta3 coverage in 2021 compared to 2016. And eight out of eighteen (44%) of NERICC states had 50% or more increase in penta3 coverage in 2021 compared to 2016 (Table 1).

Table 1
Comparison of Penta3 coverage in 18 NERICC priority States 2016 versus 2021

1	NERICC-priority States	NICs 2016- Penta3 coverage (%)	MICs/NICs 2021-Penta3 coverage (%)	Percentage Difference
	Sokoto	**3**	**12**	**75%**
2	Jigawa	7	49	86%
3	Kaduna	30	59	49%
4	Kano	16	42	62%
5	Katsina	12	43	72%
6	Borno	48	33	-45%
7	Gombe	25	39	36%
8	Bauchi	19	34	44%
9	Adamawa	38	55	31%
10	Yobe	9	65	86%
11	Zamfara	9	23	61%
12	Kebbi	11	55	80%
13	Kogi	38	60	37%
14	Taraba	16	54	70%
15	Nasarawa	35	57	39%
16	Niger	20	39	49%
17	Bayelsa	43	71	39%
18	Plateau	45	67	33%
	Average	24	48	51%

There is a steady improvement in the results of quarterly LQAS since inception in 2018 to 2023. The number of LGAs that passed the lot increased from 11(3%) in Q4 2017 to 208 (55%) in Q2 2023 in the 18-NERICC priority states (Fig. 7).

4 Discussion

In this paper, we provided a detailed examination of the establishment, organizational framework, and functioning of the National Emergency Routine Immunization Coordination Centre (NERICC). Furthermore, we delineated the various interventions implemented by NERICC to enhance routine

immunization practices. Additionally, we analyzed the trajectory of routine immunization outcomes in states with historically low performance, both pre and post the inception of NERICC.

NERICC was created in response to the concerning gaps in routine immunization coverage in the country, as revealed by the MIC/NICs of 2016, which identified over 4.3 million zero dose children despite the availability of vaccines. NERICC was established to address these challenges by conducting strategic interventions, using multi facet approaches. NERICC was designed as a routine immunization coordinating body to optimize resource allocation, improve data sharing and reduce duplication of efforts. Our analysis of the MICS/NICs of 2016 and 2021 demonstrates the substantial impact of NERICC on routine immunization coverage in Nigeria since its establishment evident by a 51% increase in average penta3 coverage in NERICC priority states from 2016 to 2021 with 94% of states achieving 20% or more increase and 44% states had 50% or more increase in penta3 coverage.

As revealed in this study, NERICCs' coordination, alongside the establishment of States and Local Government Emergency Routine Immunization Emergency Coordination Centers (SERICC and NERICC) provides the structural framework for Immunization programs at various levels. NERICC's organization structure, headed by the program manager, consists of different thematic areas responsible for implementing strategic and innovative approaches adopted to enhance routine immunization coverage in the low performing states. One of NERICC's achievement is the development of the Nigerian strategy for immunization and Primary Health care systems strengthening (NSIPSS) documents for 2018 to 2028. This strategic document serves as a guide and road map for prioritizing interventions to improve immunization coverage. The NSIPSS documents outline NERICC's routine immunization targets.

NERICC's intervention extends beyond conventional strategies, transcending to include a broader health system strengthening efforts. The adoption by NERICC of primary healthcare under one roof (PHCUOR) initiative to integrate immunization services with other healthcare provisions signifies a shift towards a comprehensive approach to healthcare delivery. This strategy not only improves service delivery but also enhances coordination and collaboration among major players and stakeholders in healthcare leading to improved healthcare outcomes. Odutolu et al emphasized the significance of primary healthcare under one roof, which has led to the establishment of State Primary Healthcare Development Board (SPHCDB), strengthened primary health system, improved accountability linkages, and increased in service delivery and utilization [28].

NERICC's Interventions are guided by the theory of change, and it serves as a road map for all its activities. Through the deployment of innovative strategies like the Optimize Integrated Routine Immunization Services (ORIS), Optimize Outreach Sessions (OOS) and the Integrated Medical Outreach Program (IMOP), NERICC has successfully reached underserved population, bridging the immunization gap exacerbated by factors such as the COVID-19 pandemic. To enhance vaccine delivery to the last mile, NERICC strengthened the supply chain and logistics through initiatives like PushPlus and the Cold Chain Equipment Optimization Plan (CCEOP) ensuring efficient vaccine delivery to the last mile. Vouking et al. [29], reported that the system redesign has improved vaccine availability at service delivery points

and reduce the cost of distributing vaccines in countries such as Nigeria. The NERICC has also implemented innovative demand generation strategies to raise awareness and drive demand for immunization. These strategies, including advocacy, community engagement and behavioral change approaches have been highly effective. These strategies and approaches have fostered positive immunization related behaviors, reduced vaccine hesitancy, and driving and sustaining demand for immunization services.

NERICC commitment to effective data management and innovation has significantly improved data reliability and quality. The introduction and implementation of data management programs such as Data Quality Improvement Plan (DQIP) and Electronic Management Of Immunization Data (EMID) have improved the accuracy and timeliness of immunization data. These initiatives have contributed to a more responsive and data-driven health management system. NERICC has also made significant efforts to strengthen human resources for health, providing a platform for continuous education, training and enhancing the capabilities of health workers in the frontline of immunization efforts.

The results and impact of NERICC intervention as analyzed in this study, have been significant, as evidenced by the trends in immunization coverage rates in low performing states. Since the creation of NERICC, there has been a discernable upward trend in routine immunization coverage, particularly from 2017 to 2023. Across all states, significant improvement has been recorded in coverage rates, exemplified by the consistent rise in Penta 3 coverage rate, with only a few declines in some states Local government Areas across these years. The implementation of this integrated medical outreach program (IMOP) led to significant immunization coverage gain with a 70% monthly coverage achieved in the first week of implementation. Other innovations such as the optimized outreach strategy (OOS) have contributed to improving service delivery and coverage across the low performing state. The findings of the PAPA-LQAS have continuously highlighted the convergence of administrative and survey data, hereby narrowing the gap between the two types of data.

Study Implication

NERICC's establishment in 2017 marked a turning point in Nigeria approach to routine immunization. This comprehensive approach guided by collaborative leadership and evidence-based strategies has significantly improved routine immunization coverage across the states in Nigeria. NERICC's Multi facets approach which includes effective leadership management, sustained financing, demand generation, comprehensive data management and enhanced service delivery has led to the notable progress in achieving its target of leaving no child behind in its immunization efforts. Despite the substantial progress, challenges remain including resource constraint and suboptimal coordination.

To sustain the gains made by NERICC, it is imperative for continuous investment in several key areas. There is a crucial need for leadership to be prioritized to ensure that effective guidance and decision making are optimized at all levels. There is a need for continuous effort for resource mobilization to secure the necessary funding for sustained immunization activities. Human resource capacity needs to be enhanced through training and recruitment initiatives to bolster the workforce involved in

immunization efforts. There is a need to enhance program effectiveness, continuous prioritization and investment in data management and innovation are paramount. Also sustaining and scaling up of innovation such as IMOP, OIRIS, as well as continuous commitment from all stakeholders is imperative for realizing Nigerians vision for equitable immunization coverage and the well-being of its citizens.

Conclusion

The establishment of the National Emergency Routine Immunization Coordination Centre (NERICC) has played a pivotal role in strengthening routine immunization systems and improving immunization coverage in Nigeria, particularly in historically low-performing states. Through its coordinated, data-driven, and multisectoral approach, NERICC has enhanced governance, service delivery, supply chain management, demand generation, data quality, and human resource capacity for immunization. The findings of this study demonstrate notable improvements in routine immunization coverage following the implementation of NERICC-led interventions, highlighting the value of strong coordination mechanisms in addressing persistent immunization challenges. While significant progress has been achieved, sustaining these gains will require continued political commitment, adequate financing, strengthened partnerships, and ongoing investment in innovation and health system strengthening. The NERICC model provides valuable lessons for other countries seeking to improve immunization performance and accelerate progress toward universal immunization coverage and the reduction of zero-dose children.

Declarations

Ethical approval

We used government secondary aggregate de-identifiable data hence ethical approval was not requested. No human subjects were involved. We obtained authorization for data access and utilization obtained.

Consent to participate

Not applicable as no human subjects were involved.

Consent to publish

Not applicable. No identifiable information was used in this study.

Clinical trial number

Not applicable.

Competing interests:

All authors of this work report no conflicts of interest.

Funding:

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Author Contribution

Conceptualization: R.G.A, D.A., G.B, S.E., A.M., D.C., POP.A., O.G., & B.O.B., Methodology: R.G.A, D.A., G.B, S.E., B.U., F.U., J.A.U., and C.W., Data Collection: G.B.B., M.M., S.E., G.E., C.E., P.A., E.H., J.A.U., A.J.A., T.N.A., O.A., R.Y., and A.M.I., Data Analysis: R.G.A., D.A.,G.B.B., M.M., S.E., G.E., C.E., P.A., J.A.U., and A.M.I., Writing – Original Draft: R.G.A., D.A.,G.B., M.M., S.E., G.E., C.E., J.A.U., P.A., A.M.I., R.K.,A.D.D., and C.W., – Review & Editing: R.G.A., D.A.,S.E., C.E., P.A., O.E.A., and C.W.

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Data availability:

The datasets used are not publicly available due to NPHCDA data protection regulations and use by NPHCDA. However, they are available from the corresponding author on reasonable request and with permission from the NPHCDA.

References

1. Jee Y. WHO’s Initiatives to Control Vaccine Preventable Diseases (VPD) and Labnet for Targeted VPDs in the Western Pacific Region. Osong Public Health Res Perspect. 2011;2(Suppl 1):S3. https://doi.org/10.1016/j.phrp.2011.11.020.
2. Toor J, Echeverria-Londono S, Li X, Abbas K, Carter ED, Clapham HE, Clark A, de Villiers MJ, Eilertson K, Ferrari M, Gamkrelidze I, Hallett TB, Hinsley WR, Hogan D, Huber JH, Jackson ML, Jean K, Jit M,

Karachaliou A, Klepac P, Gaythorpe KA. Lives saved with vaccination for 10 pathogens across 112 countries in a pre-COVID-19 world. eLife. 2021;10:e67635. https://doi.org/10.7554/eLife.67635.

3. Kapuria B, Hamadeh RS, Mazloum F, Chaalan K, Aung K, Higgins E, Kanaan W, Tohme T, Kamal D, Khoury CE, Syed S. Immunization as an entry point for primary health care and beyond healthcare interventions-process and insights from an integrated approach in Lebanon. Front health Serv. 2023;3:1251775. https://doi.org/10.3389/frhs.2023.1251775.
4. Ophori EA, Tula MY, Azih AV, Okojie R, Ikpo PE. Current trends of immunization in Nigeria: prospect and challenges. Trop Med health. 2014;42(2):67–75. https://doi.org/10.2149/tmh.2013-13.
5. Rodier G, Greenspan AL, Hughes JM, Heymann DL. Global public health security. Emerg Infect Dis. 2007;13(10):1447–52. https://doi.org/10.3201/eid1310.070732.
6. Engelbert M, Jain M, Bagai A, Parsekar SS. Improving routine childhood immunisation outcomes in low-income and middle-income countries: an evidence gap map. BMJ Open. 2022;12(11):e058258. https://doi.org/10.1136/bmjopen-2021-058258.
7. Abad N, Uba BV, Patel P, Barau DN, Ugochukwu O, Aliyu N, Ayanleke HB, Franka R, Waziri NE, Bolu O. (2021). A rapid qualitative assessment of barriers associated with demand and uptake of health facility-based childhood immunizations and recommendations to improve immunization service delivery in Sokoto State, Northwest Nigeria, 2017. The Pan African medical journal, 40(Suppl 1), 10. https://doi.org/10.11604/pamj.supp.2021.40.1.23793
8. Lindstrand A, Cherian T, Chang-Blanc D, Feikin DR, O'Brien KL. The World of Immunization: Achievements, challenges, and strategic vision for the next decade. J Infect Dis. 2021;224(Supplement4):S452–67. https://doi.org/10.1093/infdis/jiab284.
9. National Bureau of Statistics (NBS) and United Nations Children's Fund (UNICEF). Multiple Indicator Cluster Survey 2021: Survey Findings Report. Abuja, Nigeria: National Bureau of Statistics and United Nations Children's Fund; 2016.
10. Gavi Zero-Dose Learning Hub. 2023. Nigeria Zero-Dose Situation Analysis. https://zdlh.gavi.org/
11. Mbaeyi C, Kamawal NS, Porter KA, Azizi AK, Sadaat I, Hadler S, Ehrhardt D. Routine immunization service delivery through the Basic Package of Health Services program in Afghanistan: gaps, challenges, and opportunities. J Infect Dis. 2017;216(suppl1):S273–9. https://doi.org/10.1093/infdis/jiw549.
12. Faizan A, Rehman T, Mughal S. Re-emergence of polio in Pakistan: Can the nation achieve the WPV1 eradication goal? Health Sci Rep. 2024;7(2). https://doi.org/10.1002/hsr2.1862.
13. (2015). Measles — United States, January 1–October 1, 2015. MMWR. Centers for Disease Control and Prevention, Morbidity. and Mortality Weekly Report, 64(41), 1165–1168. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6441a2.htm
14. Khan EA, Panezai MI, Shahid B, Shahabuddin A, Akber S. Increasing the demand for vaccination through mHealth in Quetta City, Balochistan in Pakistan. J Global Health Rep. 2021;5. https://doi.org/10.29392/001c.28999.

15. Assefa Y, Gelaw YA, Hill PS, Taye BW, Van Damme W. Community health extension program of Ethiopia, 2003–2018: successes and challenges toward universal coverage for primary healthcare services. Globalization Health. 2019;15(1). https://doi.org/10.1186/s12992-019-0470-1.
16. Rudgard WE, Dzumbunu SP, Yates R, Toska E, Stöckl H, Hertzog L, Emaway D, Cluver L. Multiple Impacts of Ethiopia's Health Extension Program on Adolescent Health and Well-Being: A Quasi-Experimental Study 2002–2013. J Adolesc Health. 2022;71(3):308–16. https://doi.org/10.1016/j.jadohealth.2022.04.010.
17. Sodha SV, Dietz V. Strengthening routine immunization systems to improve global vaccination coverage. Br Med Bull. 2015;113(1):5–14. https://doi.org/10.1093/bmb/ldv001.
18. Gooding K, Bertone MP, Loffreda G, Witter S. How can we strengthen partnership and coordination for health system emergency preparedness and response? Findings from a synthesis of experience across countries facing shocks. BMC Health Serv Res. 2022;22(1). https://doi.org/10.1186/s12913-022-08859-6.
19. Etamesor S, Ottih C, Salihu IN, Okpani AI. BMJ Global Health. 2018;3(5):e000807. https://doi.org/10.1136/bmjgh-2018-000807. Data for decision making: using a dashboard to strengthen routine immunization in Nigeria.
20. Olorunsaiye CZ, Degge H. Variations in the uptake of routine immunization in Nigeria: Examining determinants of inequitable access. Global Health Communication. 2016;2(1):19–29. https://doi.org/10.1080/23762004.2016.1206780.
21. World Health Organization: WHO. (2023a, August 30). Breaking barriers, building bridges: the collaborative effort to reach every child in Nigeria. https://www.who.int/news-room/feature-stories/detail/breaking-barriers-building-bridges-collaborative-effort-nigeria
22. Jean Baptiste AE, Wagai J, Hahné S, Adeniran A, Koko RI, de Vos S, Shibeshi M, Sanders EAM, Masresha B, Hak E. (2023). High-resolution geospatial mapping of zero-dose and under-immunized children following Nigeria's 2021 multiple indicator cluster survey/national immunization coverage survey (MICS/NICS). The Journal of infectious diseases, jiad476. Advanced online publication. https://doi.org/10.1093/infdis/jiad476
23. Mahachi K, Kessels J, Boateng K, Baptiste J, Mitula AE, Ekeman P, Nic Lochlainn E, Rosewell L, Sodha A, Abela-Ridder SV, B., Gabrielli AF. Zero- or missed-dose children in Nigeria: Contributing factors and interventions to overcome immunization service delivery challenges. Vaccine. 2022;40(37):5433–44. https://doi.org/10.1016/j.vaccine.2022.07.058.
24. Eboreime E, Abimbola S, Bozzani F. Access to Routine Immunization: A Comparative Analysis of Supply-Side Disparities between Northern and Southern Nigeria. PLoS ONE. 2015;10(12):e0144876. https://doi.org/10.1371/journal.pone.0144876.
25. Akwataghibe N, Ogunsola EA, Broerse JEW, Popoola O, Agbo AI, Dieleman M. Exploring factors influencing immunization utilization in Nigeria—A mixed methods study. Front Public Health. 2019;7. https://doi.org/10.3389/fpubh.2019.00392.

26. Oluwadare C, Iwu-Jaja VO, Akuoko CJ, Adewuyi CP, E. O., Khanal V. (2022). Medicines and vaccines supply chains challenges in Nigeria: a scoping review. BMC Public Health, 22(1). https://doi.org/10.1186/s12889-021-12361-9.
27. Akinyemi O, Adebayo A, Bassey C, Nwaiwu C, Kalbarczyk A, Nomhwange T, Alonge OO, Owoaje ET. A qualitative exploration of the contributions of Polio Eradication Initiative to the Nigerian health system: policy implications for polio transition planning. Trop Med health. 2022;50(1):38. https://doi.org/10.1186/s41182-022-00429-0.
28. Odutolu O, Ihebuzor N, Tilley-Gyado RD, Martufi V, Ajuluchukwu M, Olubajo O, Banigbe B, Fadeyibi O, Abdullhai R, Muhammad AJG. Putting Institutions at the Center of Primary Health Care Reforms: Experience from Implementation in Three States in Nigeria. Health Syst Reform. 2016;2(4):290–301. https://doi.org/10.1080/23288604.2016.1234863.
29. Vouking MZ, Mengue CMA, Yauba S, Edengue JM, Dicko M, Dicko HM, Wiysonge CS. Interventions to increase the distribution of vaccines in Sub-Saharan Africa: a scoping review. Pan Afr Med J. 2019;32:14. https://doi.org/10.11604/pamj.2019.32.14.17225.

Figures

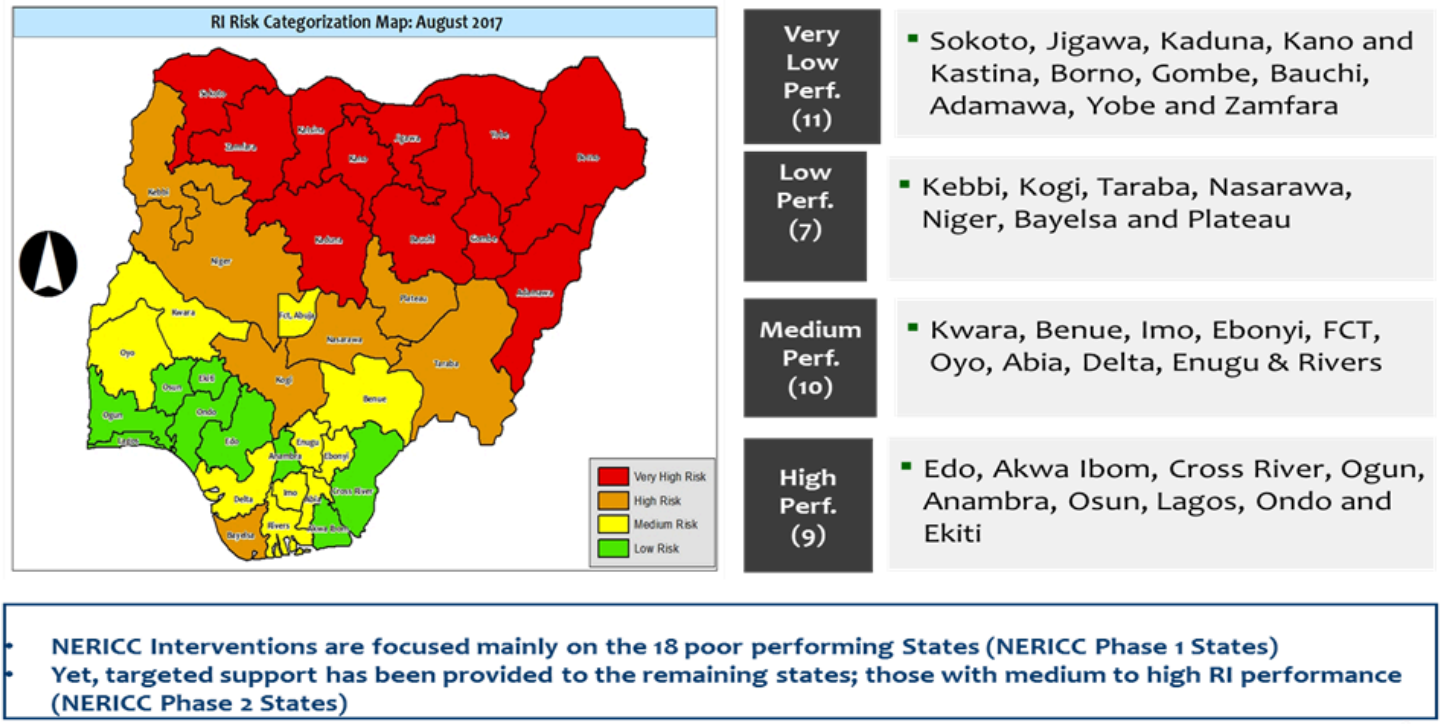


Figure 1

NSIPPS categorization of States

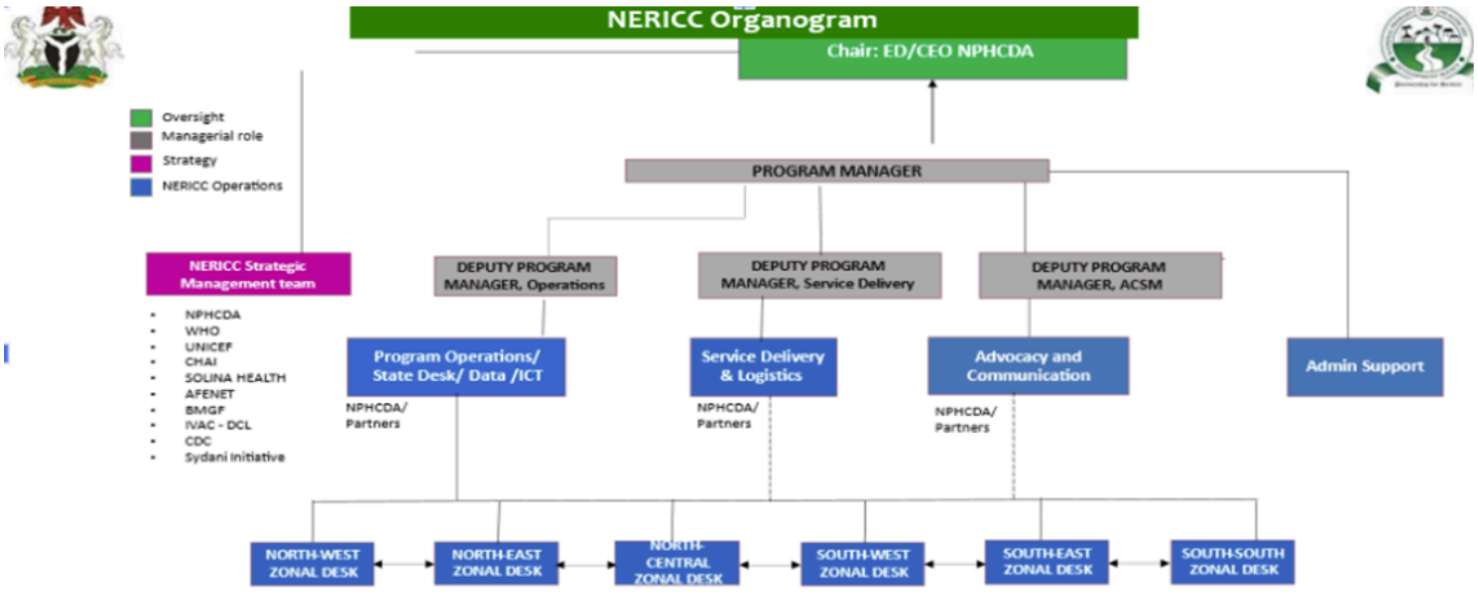


Figure 2

National Emergency Routine Immunization Coordination Centre (NERICC) Organogram

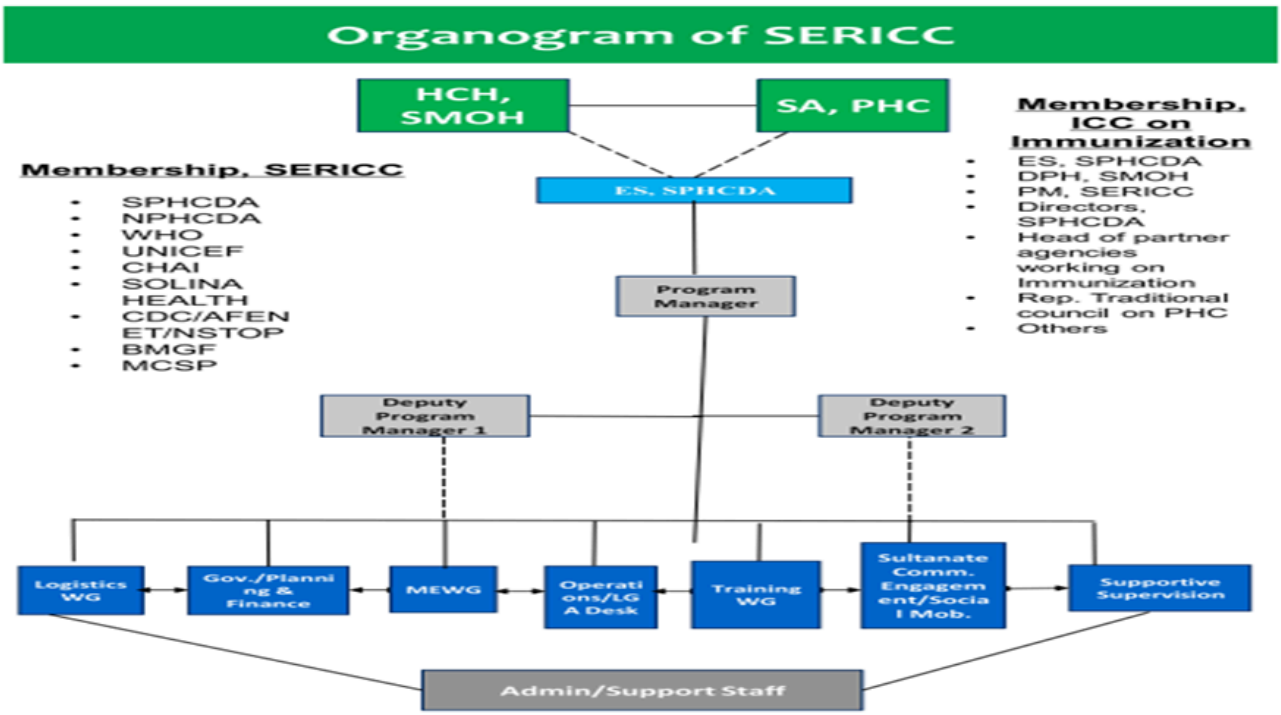


Figure 3

The SERICC Organogram

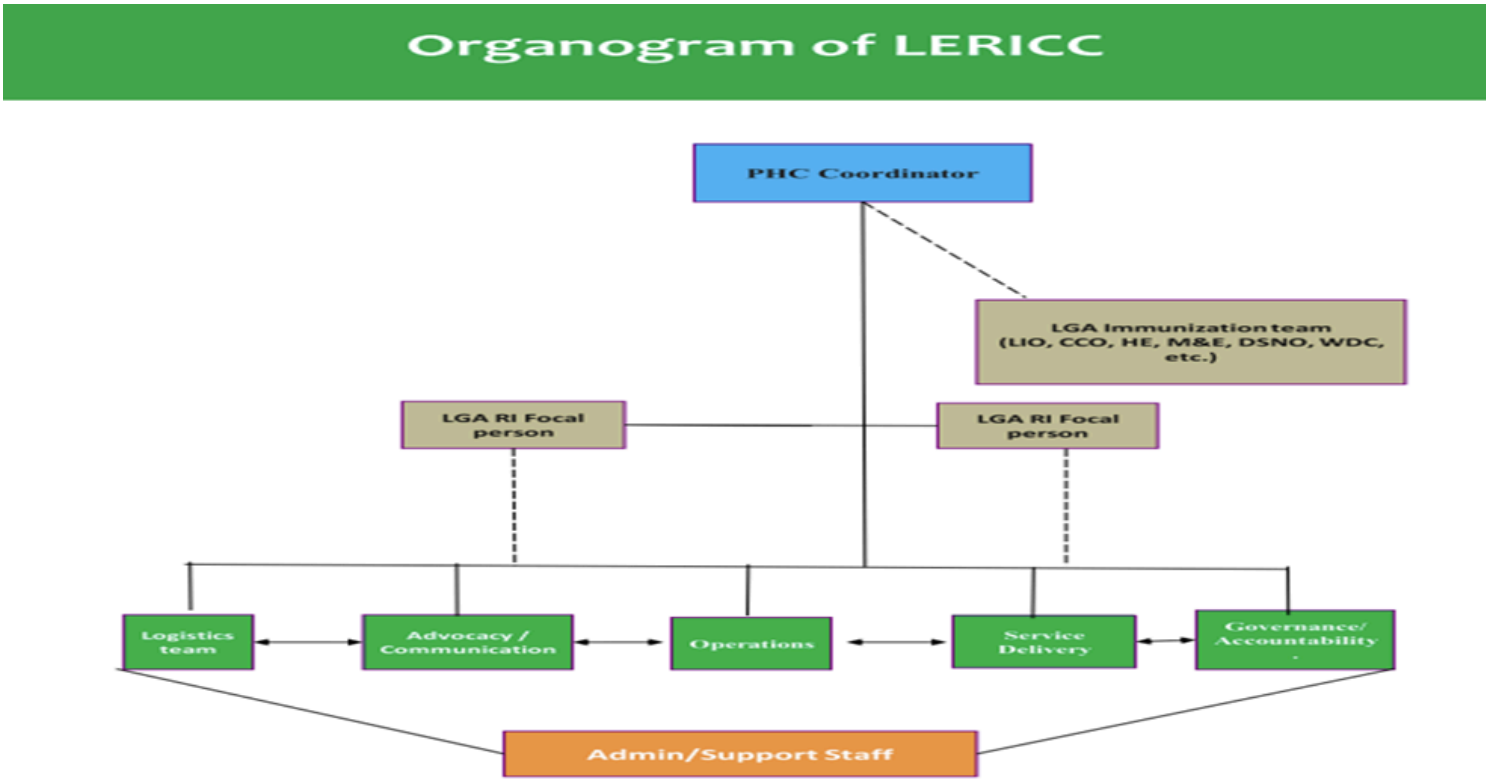


Figure 4

The LERICC Organogram

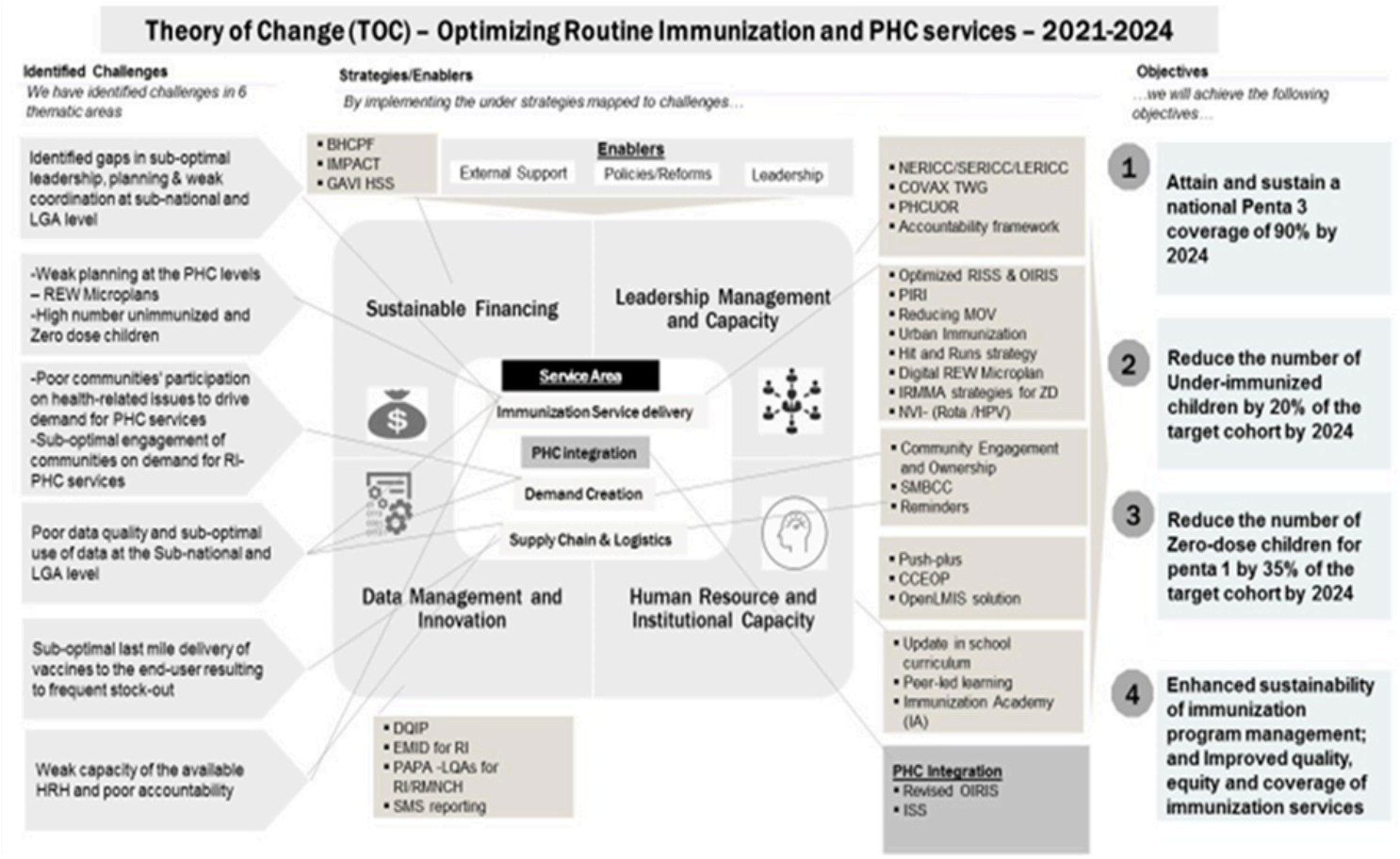
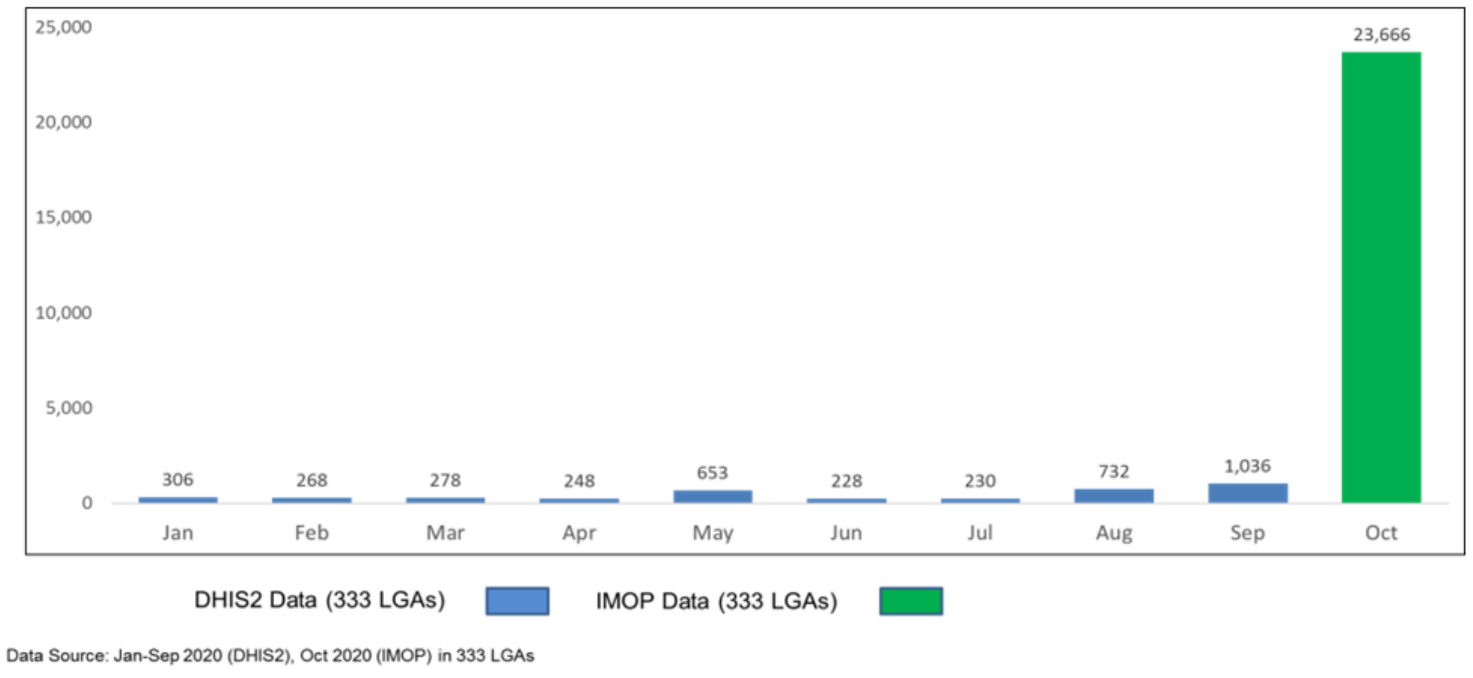


Figure 5

Theory of Change (TOC) for Routine Immunization and PHC Services Strengthening 2021-2024



Data Source: Jan-Sep 2020 (DHIS2), Oct 2020 (IMOP) in 333 LGAs

Figure 6

Monthly Trend of 12-23 Months children immunized with increases in 333 LGAs in the DHIS2 (Jan-Sep) vs IMOP (1 week in October)

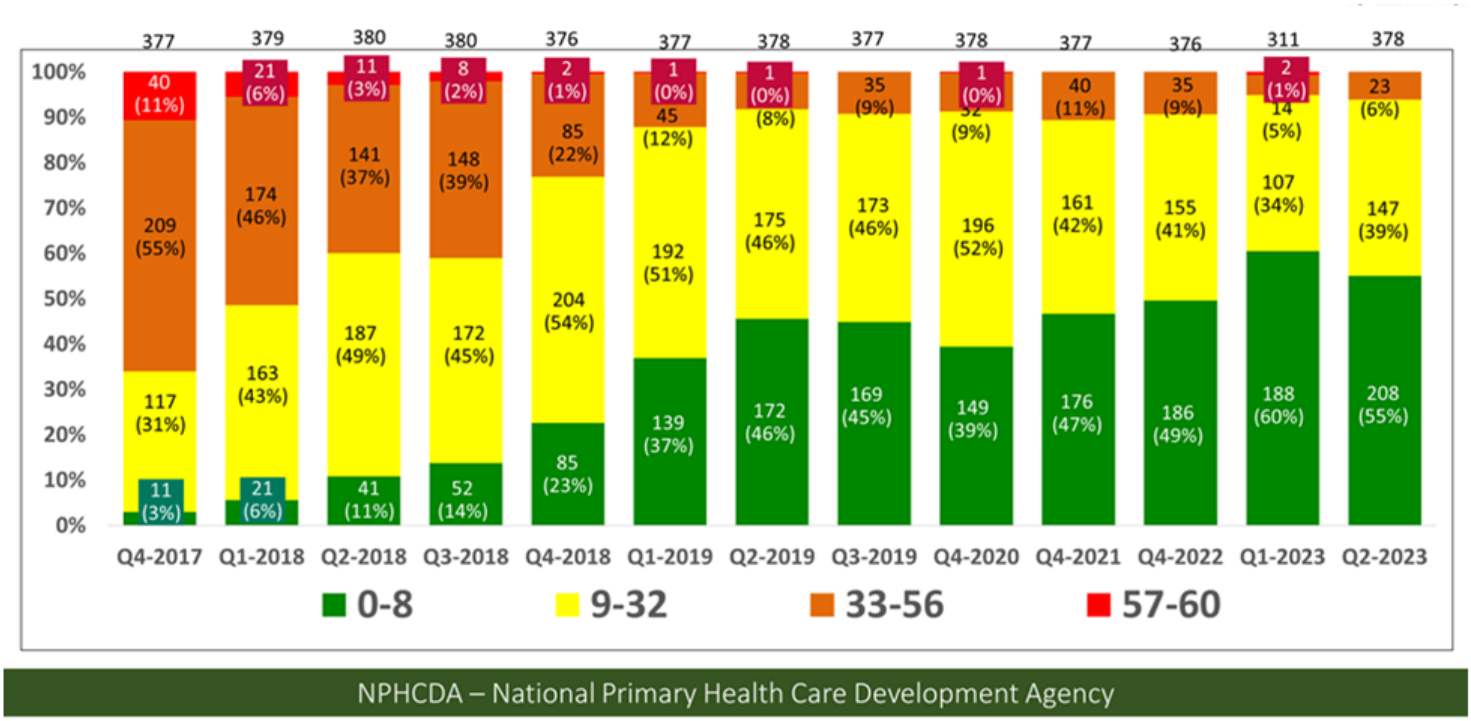


Figure 7

Trend of Quarterly PAPA LQAS in 18 NERICC states, 2018 – 2023