Assessment of the Political Economy Context Surrounding Evidence Use for Zero-Dose Programming and Policies in Nigeria

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Gavi Zero-Dose Learning Hub

Funded by Gavi, the Zero-Dose Learning Hub (ZDLH) serves as the global learning partner and is led by JSI Research & Training Institute, Inc. (JSI) with two consortium partners, The Geneva Learning Foundation (TGLF) and the International Institute of Health Management Research (IIHMR). Together, the consortium enables sharing and learning across four Country Learning Hubs in Bangladesh, Mali, Nigeria, and Uganda to advance the uptake of evidence by synthesizing and disseminating key learnings. The ZDLH also focuses on improving immunization equity and reducing the number of zero-dose and under-immunized children globally by facilitating high-quality evidence generation and uptake.

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ACRONYMS

AHBN	Africa Health Budget Network
AFENET	African Field Epidemiology Network
AFRIN	Accountability Framework for Routine Immunization in Nigeria
AI	artificial intelligence
BCG	Bacillus Calmette-Guerin
CHAI	Clinton Health Access Initiative
CHAN	Christian Health Association of Nigeria
CLH	Country Learning Hub
DHS	demographic and health survey
DTP	diphtheria-tetanus-pertussis
EMID	Electronic Management of Immunization Data
EPI	Expanded Programme on Immunization
FGON	Federal Government of Nigeria
FMOH	Federal Ministry of Health
GPEI	Global Polio Eradication Initiative
IMPACT	Immunization Plus and Malaria Progress by Accelerating Coverage and Transforming Services
IRMMA	Identify-Reach-Monitor-Measure-Advocate
KII	key informant interview
KT	knowledge translation
LERICC	Local Emergency Routine Immunization Coordination Centre
LGA	local government authorities
MICS	Multiple Indicator Cluster Survey
NDHS	Nigeria Demographic and Health Survey
NERICC	National Emergency Routine Immunization Coordination Centre
NPHCDA	National Primary Health Care Development Agency
NSIPSS	Nigeria Strategy for Immunization and PHC System Strengthening
ODK	Open Data Kit
PAPA-LQAS	Performance Assessment for Programme Management and Action-Lot Quality Assurance Sampling

PCCS	post-campaign coverage survey
PHC	Primary Health Care
PEA	Political Economy Analysis
RI	Routine Immunization
RI-SMS	Routine Immunisation Short Message Service
RISS	Routine Immunization Supportive Supervision
SERICC	State Emergency Routine Immunization Coordination Centre
SIA	supplementary immunization activities
SMS	Short Message Service
SPHCDA	State Primary Health Care Development Agency
UNICEF	United Nations Children's Fund
VERSE	Vaccine Economics Research for Sustainability and Equity
WUENIC	WHO and UNICEF Estimates of National Immunization Coverage
WHO	World Health Organization
ZD	zero-dose
ZDLH	Zero-Dose Learning Hub

1. INTRODUCTION

1.1 OVERVIEW OF ZERO-DOSE IN NIGERIA

Achieving equitable vaccination coverage and ensuring no one is left behind are key goals of the Immunization Agenda 2030 and global health efforts. While immunization coverage has improved worldwide, with the number of children dying from vaccine-preventable diseases dropping by 70 percent over the past two decades, there are still millions of children who are not vaccinated (estimated at around 17 percent). Gavi, the Vaccine Alliance defines zero-dose (ZD) children as not having received the first dose of diphtheria-tetanus-pertussis (DTP) containing vaccine. Gavi estimates that ZD children account for nearly half of all vaccine-preventable deaths and nearly 50 percent of ZD children live in three key geographic contexts: urban areas, remote communities, and populations in conflict settings. Low- and middle-income countries still bear a disproportionately high burden of un- and under-vaccinated children, which the COVID-19 pandemic exacerbated by disrupting immunization programs and services and deepening inequity and immunity gaps. In support of the global movement to end to this inequity, Gavi aims to reduce the number of ZD children by 25 percent by 2025 and by 50 percent by 2030.

Nigeria is the most populous country in Africa, with an estimated population of 201 million in mid-2019.[1] More than four million Nigerian children under one year of age missed one or more vaccinations in 2017 and again in 2018.[2] In 2020, an additional 500,000 children were unvaccinated because of the COVID-19 pandemic. Nigeria has 2.2 million ZD children, more than any other country in Africa and among the highest number worldwide.[3] These children live primarily in the Northern Nigeria states and informal urban environments. The reasons for lack of vaccination among children under five years are complex. Equity analyses performed using the 2013 and 2018 demographic and health survey (DHS) data demonstrate stark inequalities based on wealth (over 70 percentage points), maternal education (50 percentage points), and place of residence (nearly 40 percentage points).[4] Through surveys and qualitative research, documented barriers to vaccination included mistrust of the government and vaccines, poor treatment of mothers by health workers, lack of awareness, fear of adverse events following immunization, shortage of health workers, long waiting times, and long travel times to health care centers to receive vaccinations. More details are available in the Nigeria ZD Country Landscape, Nigeria ZD Situation Analysis, and Rapid Assessment Report.

1.2 ORGANIZATION OF IMMUNIZATION SERVICES

Health services in Nigeria, including vaccination of children, are provided by the public sector at all three levels of government (federal, state, and local government authorities [LGAs]) and by private providers (formal for profit, non-profit, and informal). The private sector is estimated to account for over 60

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[1] Population Reference Bureau. "International Data: Nigeria.
[2] VanderEnde, Kristin et al. 2018. "Global Routine Vaccination Coverage—2017." *Morbidity and Mortality Weekly Report* 67 (45): 1-8.
[3] UNICEF. 2023. "The State of the World's Children 2023."
[4] Shearer, Jessica C. et al. 2023. "Uncovering the Drivers of Childhood Immunization Inequality with Caregivers, Community Members and Health System Stakeholders: Results from a Human-Centered Design Study in DRC, Mozambique and Nigeria." *Vaccines* 11 (3): 689.

percent of health care services.[5] However, there are significant regional differences. In Northern Nigeria, the public sector provides over 90 percent of all health services including vaccination, while in Southern Nigeria, the private sector provides over 70 percent of health services including vaccination.[6] More than four million Nigerian children under one year of age missed one or more vaccinations in 2017 and again in 2018.[7] The prevalence of ZD children in Nigeria has increased over time, with an estimated 6.2 million children missing out on receiving a single dose of their routine vaccines from 2019 to 2022 due to the COVID-19 pandemic.[8]

Nigeria has made progress improving vaccination coverage over the last two decades, with the percentage of children aged 12–23 months who have received their basic vaccination increasing from 23 percent in 2008 to 44 percent in 2021.[9, 10] It is critical that children receive their first vaccine doses: existing research shows that 80 percent of children who receive at least one dose of any vaccine will receive at least one further vaccine, and two-thirds will complete the full schedule.[11]

According to the Nigerian Federal Ministry of Health (FMOH) definition, a child is considered fully vaccinated if he or she has received a Bacillus Calmette-Guerin (BCG) vaccination against tuberculosis; three doses of DTP; at least three doses of polio vaccine; and one dose of measles vaccine. All these vaccinations should be received during the first year of life, over the course of five visits, including the doses delivered at birth. Children aged 12–23 months who are vaccinated according to this schedule will complete their immunizations and be fully immunized. To keep track of these immunizations, Nigeria provides parents or guardians with a health card on which each dose is recorded.

1.3 EXISTING ROUTINE IMMUNIZATION POLICIES AND PROGRAMS

In 2020, as a first step in identifying where ZD children live, the Global Action Plan for Healthy Lives and Well-being for All (SDG3 GAP) platform and the Federal Government of Nigeria (FGON), through the National Primary Health Care Development Agency (NPHCDA) with support from United Nations Children's Fund (UNICEF) and World Health Organization (WHO), created a data system that identified a priority set of 100 LGAs in 18 states.[12]

These actions led to signing of the Nigeria Strategy for Immunization and Primary Health Care System Strengthening (NSIPSS) between the FGON and Gavi. NSIPSS serves as the basis for the extension of Gavi support to 2028. The NSIPSS includes an Accountability Framework which will allow the FGON to provide incremental funds from budgetary sources every year culminating in 100 percent funding for vaccine procurement by 2028.[13] NPHCDA and partners including WHO and UNICEF developed an Immunization Recovery Plan 2022–2025 that incorporated a Big Catch-Up plan specifically targeting ZD children.[14]

The World Bank is currently partnering with 16 priority states through the Immunization Plus and Malaria Progress by Accelerating Coverage and Transforming Services (IMPACT) Project, focusing on

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[5] FMOH. 2009. The National Strategic Health Development Plan Framework (2009–2015).

[6] Ichoku, Hyacinth E., and Okoli, Chijioke I. 2014. "Fiscal Space for Health Financing in Nigeria." *African Journal of Health Economics* 2 (2): 1-8.

[7] VanderEnde, Kristin, et al. Global Routine Vaccination Coverage—2017; U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, *Morbidity and Mortality Weekly Report*, 67 (45): 1-8.

[8] World Health Organization. 2023. "WHO Partners Government for Big-Catch-up Campaign to Close Immunization Coverage Gaps."

[9] NPC, National Population Commission, and ICF. 2019. "Nigeria Demographic and Health Survey 2018."

[10] UNICEF. 2022. "2021 Multiple Indicator Cluster Survey/National Immunization Coverage Survey Report | UNICEF Nigeria."

[11] WHO. 2024. Immunization Coverage Key Facts 2020.

[12] Breaking barriers, building bridges: the collaborative effort to reach every child in Nigeria.

[13] The Nigeria Vaccine Policy 2021.

[14] WHO. 2023. WHO partners government for Big-Catch-up campaign to close immunization coverage gaps.

strengthening vaccine supply, cold chain equipment, and monitoring systems to reduce under-five mortality rates.[15] Additionally, funding channels and technical assistance from the Global Fund, WHO, and UNICEF supported 17 states in reaching identified ZD local government areas.[16] Through the Gavi health systems strengthening project, Gavi collaborated directly with eight priority states, addressing low immunization coverage and a high burden of ZD children with a USD 50 million dollar grant for primary health care (PHC) and immunization services.[17]

1.4 OVERVIEW OF IRMMA AND THE ZDLH PROJECT

Gavi's Identify-Reach-Monitor-Measure-Advocate (IRMMA) framework provides a comprehensive approach for addressing the immunization needs of vulnerable groups. The framework supports countries to adopt a structured approach to reach ZD children and missed communities as a pathway to equitable PHC (see Figure 1).

Figure 1. The IRMMA Framework

Source: https://zdlh.gavi.org/
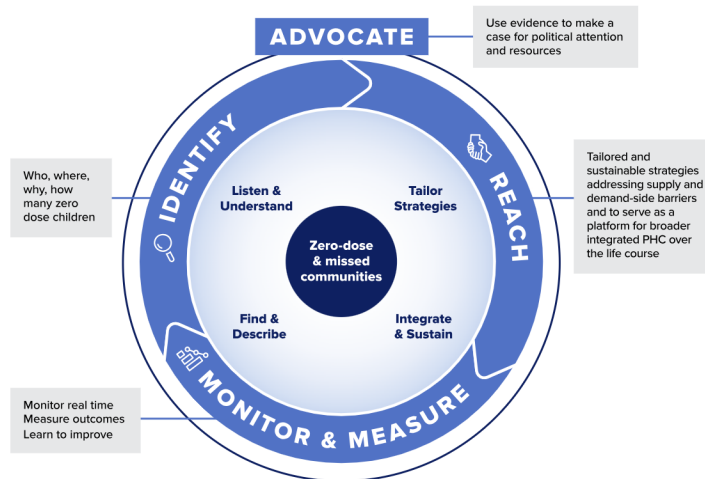
IRMMA implementation requires the involvement of various actors, each responsible for different components of the framework. These actors may include government agencies, health care providers, community leaders, non-governmental organizations, and other stakeholders. The IRMMA framework is used to initiate multi-stakeholder discussions to determine appropriate interventions for Gavi investments. The approach is locally adapted and tailored to the characteristics of each country context depending on who and where ZD children are, the underlying barriers to immunization, the security situation, and the relative strength of the health system.

In Nigeria, several stakeholders, such as the NPHCDA, have adapted the IRMMA framework for service delivery at the federal, state, and local levels. The Gavi-funded Nigeria Country Learning Hub (CLH) facilitates evidence generation and uptake for the adaptation of the IRMMA framework in the country.

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[15] World Bank Group. 2020. "Nigeria - Immunization Plus and Malaria Progress by Accelerating Coverage and Transforming Services Project."
[16] UNICEF. 2023. "Health workers are reaching zero-dose children in Nigeria's urban slums."
[17] Onyeji, Ebuka. 2018. "FG, GAVI Commit $2.7 Billion to Strengthen Immunization, Primary Health." Premium Times, June 11, 2018.

The Nigeria CLH is led by African Field Epidemiology Network (AFENET) in partnership with Africa Health Budget Network (AHBN) and works in close collaboration with the NPHCDA.

At the global level, the Zero-Dose Learning Hub (ZDLH) addresses the need for actionable evidence on how to identify and reach under-immunized and ZD children by strengthening organizational learning capacity and applying findings from national, regional, and global levels to influence immunization policy and programming. The ZDLH operates in support of country ministries of health and Expanded Programme on Immunization (EPI) programs. At the country level, the Nigeria CLH helps to improve immunization equity and reduce the number of ZD and under-immunized children globally by facilitating high-quality evidence generation and uptake.

To reach this goal, the objectives of the Nigeria CLH include:

- Collaborate with key stakeholders such as the NPHCDA to implement a ZD learning agenda.

- Facilitate learning and sharing within and across the key stakeholders responsible for ZD immunization.

- Contribute evidence and capture, synthesize, and disseminate learnings in a timely manner.

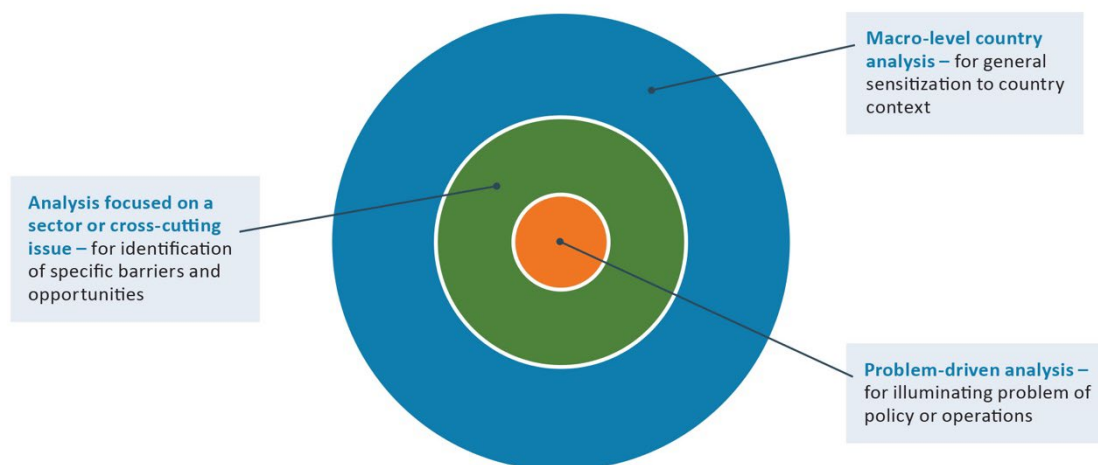## 1.5 PURPOSE OF THE POLITICAL ECONOMY ANALYSIS

The Political Economy Analysis (PEA) approach is intended to inform the Nigeria CLH's activities by identifying areas for concentrated support so the various stakeholders involved in delivering immunization services in the country can reach ZD children. Specifically, this analysis will map the regulatory framework, interests, constraints, and power dynamics that affect different actors within the system, including their actions or lack thereof in relation to data generation, integration, and use among immunization stakeholders at the country level. With a better understanding of the political economy of this system, the CLH can define entry points and develop strategies to engage relevant stakeholders effectively. The aim is to foster evidence-informed decision making and promote the generation and use of evidence to address the immunization needs of ZD children and missed communities in Nigeria.

2. METHODS

2.1 PROBLEM-BASED PEA

This study adopted a problem-driven PEA framework to understand the policy and operational problems that impede immunization stakeholders from systematically generating and effectively using evidence to improve immunization coverage. **Political economy** refers to the intersecting incentives, interests, and values that shape the operations of complex systems and the actions or decisions of key actors within that system. The political economy can include highly visible, material interests alongside more invisible social or cultural norms. The purpose of this analysis is to describe those underlying interests and values which ultimately shape decision-making, resource allocation, and the success and failure of initiatives. The PEA is nested in an understanding of the broader context of cross-cutting issues within the immunization sector and the macro issues affecting development at the country level (Figure 2).

Figure 2. Levels of Political Economy Analysis

Source: Department for International Development. 2009. Political Economy Analysis.

This study was organized using the three-layer approach proposed by Fritz et al. (2009) and illustrated in Figure 3. The analysis begins by identifying a specific problem or policy issue and investigates how actors within the systems interact to address or perpetuate the problem. Factors like power dynamics, institutional arrangements, and information asymmetries are considered in assessing decision-making and policy outcomes. This approach keeps the focus on the issue at hand and works backward to delineate the structural features, regulatory and institutional frameworks, formal and informal power dynamics, and the feasibility to change. The study ultimately seeks to provide a comprehensive understanding of political economy contexts and offer practical policy recommendations that account for the realities of decision-makers.

Figure 3. Layers and Key Concepts of Problem-Driven PEA
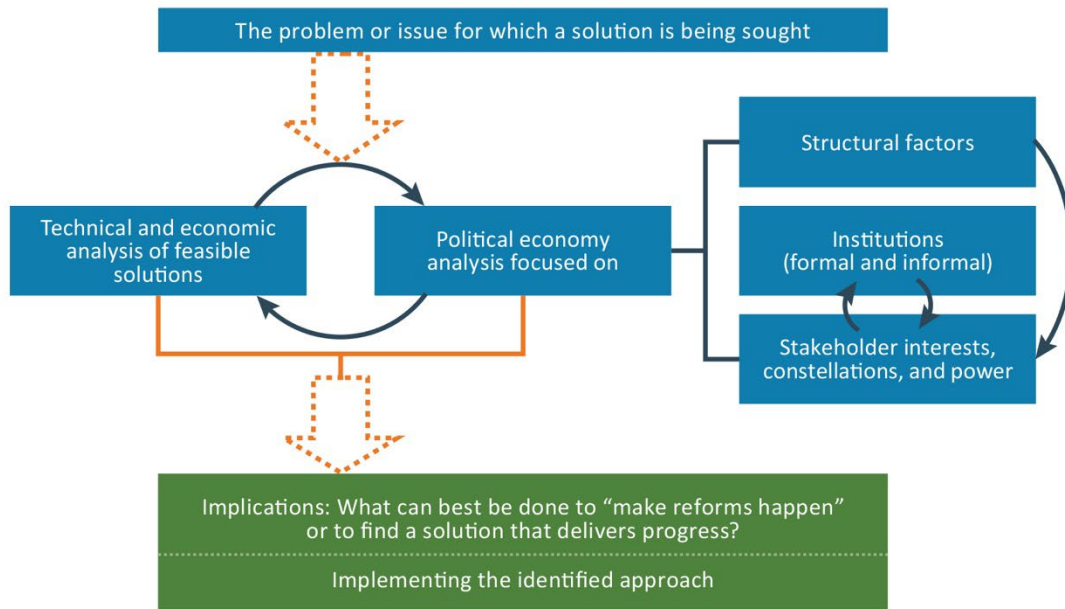
Source: Fritz, V., Levy, B., and Ort, R. 2014. "Problem-Driven Political Economy Analysis." Directions in Development: Public Sector Governance. The World Bank.

After the CLH consulted with Gavi and key immunization stakeholders, it was clear that while immunization data, especially routine data, exists, there are many different, unintegrated data sources and many different systems for ZD measurement in Nigeria. This limits the effective use of that data for programming and policy development at all levels. The PEA, then, was an exercise to not only describe this problem, but also to better understand **why** this particular problem persists. The PEA adapted the following conceptual framework (Figure 4) to orient the organization and analysis of the study.

Figure 4. Conceptual Framework for a Problem-based PEA for Zero-Dose Children in Nigeria
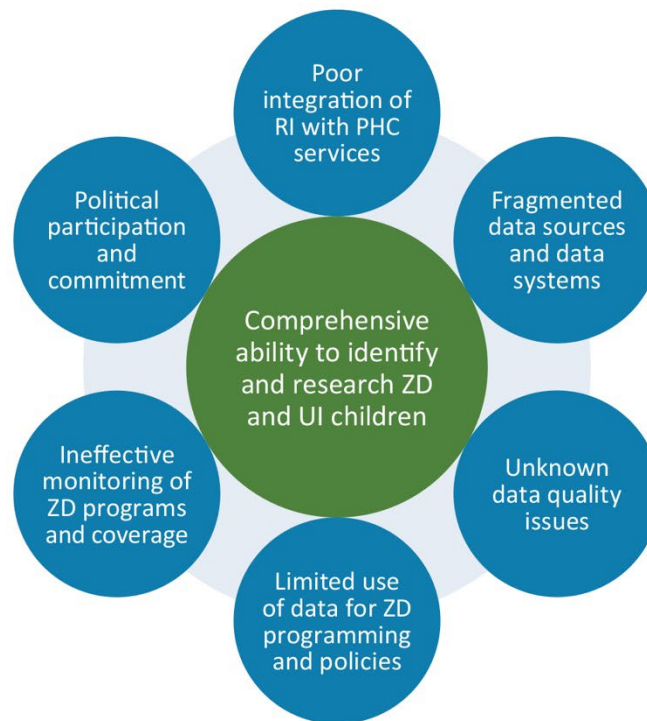
2.2 Study Design

The study employed a qualitative design using both primary and secondary data. Primary data was collected through key informant interviews (KIIs) with a range of purposively selected immunization stakeholders. Secondary data include a desk review of relevant literature and documents.

The study intended to identify the range of stakeholders (from the government, international and national agencies, and the private sector at national and local levels) involved in evidence generation and use, including those involved with policy formulation, program delivery, monitoring, and evaluation of immunization services with particular focus on ZD populations. The study also carried out a comprehensive review of relevant documents on existing immunization data systems and interventions to improve the uptake of relevant data among stakeholders at national and subnational levels.

2.2.1 Study Aims and Objectives

The overall aim of this study is to analyze the political economy influencing the generation and use of evidence and learning to inform ZD programming and policies in Nigeria.

The specific objectives include:

- Examining existing structural features, regulatory frameworks, and institutional dynamics at the national and subnational levels that influence the generation and use of evidence to inform policies and programming for ZD in Nigeria.

- Assessing the extent to which data sources and systems for childhood immunization are integrated to facilitate data sharing across projects, initiatives and organizations; improve coordination and collaboration across these different entities and efforts; and avoid duplication of efforts.

- Constructing a framework of formal and informal decision-making related to the generation and use of evidence for ZD-related policies and programming by multi-level, multidisciplinary stakeholders.

2.2.2 Desk Review Approach

We used a narrative review approach to provide an overview and synthesis of current knowledge about data sharing, decision making, and use of evidence for monitoring and measuring ZD and IU children in Nigeria. We designed the desk review to establish the context and backdrop of the problem, including a description of the existing routine data systems in Nigeria that collect, capture, and report data on ZD children as well as details related to fragmentation (or siloing) of existing data systems needed for planning ZD interventions and coordination (or lack thereof) among stakeholders at different levels of the health system.

Data systems covered in the review include DHIS2, Short Message Service (SMS), Nigeria Demographic and Health Survey (NDHS), Performance Assessment for Programme Management and Action-Lot Quality Assurance Sampling (PAPA-LQAS), logistic management information system, post-campaign coverage survey (PCCS) for polio and other vaccination campaigns, non-polio supplementary immunization activities (SIA), periodic intensification of routine immunization (RI), measles, yellow fever, fractional-dose inactivated polio vaccine, and surveillance data for reportable diseases.

2.2.3 Search Strategy

We searched published literature using PubMed, Embase, Scopus, and Google Scholar databases. We used targeted informational sources including the websites of NPHCDA, UNICEF, World Bank, WHO, Gavi, USAID MOMENTUM, Gates Foundation, Clinton Health Access Initiative (CHAI), and Global Polio Eradication Initiative (GPEI) to find grey literature (reports, guidelines, toolkits, assessments, handbooks, and meeting notes).

Our search focused on the generation, synthesis, and use of evidence for continuous improvement of immunization programming and policies in Nigeria, with a focus on data systems for RI and understanding issues related to ownership and fragmentation of data.

Table 1. Search Methods for Nigeria PEA Desk Review

Objective	To understand pathways of evidence generation, synthesis, and use for continuous improvement of immunization programming and policies in Nigeria, with a focus on data systems.
Date range	2000–October 2023
Study location	Global
Literature type	Published and grey literature
Language	English
Databases and websites	Databases: PubMed, Embase, Scopus, Google Scholar Websites: NPHCDA, UNICEF, World Bank, WHO, Gavi, USAID MOMENTUM, Gates Foundation, CHAI, GPEI
Search terms	evidence use/evidence synthesis/evidence uptake/evidence utilization/political participation/political commitment/political economy/data systems/data fragmentation/data quality PLUS immunization/vaccination/zero-dose/unvaccinated/under immunized PLUS Nigeria

2.2.4 Primary Data Collection

Qualitative data collection took place from June 2023 to November 2023. All key informants were interviewed using a semi-structured in-depth interview guide that addressed the research objectives. The guide included questions on socio-demographic characteristics; roles and responsibilities of the stakeholders; elements of data sources and systems; policy expectations around ZD measurement and data use; organizational, infrastructural, and functional support; and outcomes related to immunization. The questions were customized according to the stakeholder and their role and level within the immunization program.

2.2.5 Data Analysis

We used a deductive approach for the analysis of the interview data. Overarching themes were drawn from the desk review and KII guides to frame the analysis. Interviewers used a pre-tested, semi-structured interview guide to elicit information from all respondents. All interview data collected for this study were audio-recorded with prior consent from participants. Transcripts were generated using otter.ai. After data cleaning, all responses were extracted and analyzed using an Excel spreadsheet to facilitate the organization of content and identification of important quotes under the relevant themes.

We also conducted a second layer of analysis with a particular focus on mining the data to understand and describe the power dynamics among the different stakeholders. We used a power dynamics behavioral framework, developed by JSI under the USAID Momentum Country and Global Leadership

and adapted from work done by the USAID Breakthrough RESEARCH project for this extraction.[18, 19] Table 2 below outlines the dimensions of power used for this PEA.

Table 2. Dimensions of Power

POWER DYNAMICS ANALYSIS: Nigeria PEA	
Outcome: National and sub-national actors within government and civil society work together to use data to better plan programming and policy for reaching ZD. **Assumption on Impediments to Success:** These actors do not do this currently because systems and sources for data are not integrated.	
POWER TO (what do we know about how much control any individual actor has to appropriately use data, given resources, authority, access)	
Accessibility (time, availability, cost, rights, etc.)	What, if any, accessibility-related issues impact the actor's use of data?
Laws and policies	What, if any, legal or policy-related constraints influence use of data at different levels? How do these constraints function?
Authority, decision making, and accountability	Who makes decisions? Who is accountable for different decisions? Who is held accountable for what? Does the actor feel like they are required or there will be repercussions for doing or not doing something?
Incentives	What incentives exist for using data in the ideal way? What disincentives exist for using data? (Explore economic, religious, moral, or social incentives)
POWER WITH (What do we know about how different actors work collaboratively or non-collaboratively to share necessary data, learn from each other, identify gaps, and collectively solve problems)	
Institutional support	How much institutional (or community) support does the actor receive? What kind? What does the support look like?
Social Support	How is this actor's use of data influenced by that of other actors? How does this actor relate to other actors in this system?
Gender	Are there any gender dimensions to generation or use of data? What are they?
Norms	How different is the ideal use of data from the norm? If different, how challenging will it be for the actor to act in a way that is different from the norm?
POWER WITHIN (What do we know about different actors' internal capability or sense of self-worth/ self-knowledge in the use of data?	
Perception of quality or relevance	How important does the actor feel the use of data is? How relevant is it and in what way?

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[18] Behaviorally Focused Applied Political Economy Analysis (2021). MOMENTUM Country and Global Leadership.

[19] USAID's Breakthrough Research project (*Breakthrough RESEARCH. 2022. "Expressions of power in health care providers' experiences and behavior," Breakthrough RESEARCH Programmatic Research Brief. Washington DC: Population Council).

Perception of benefit or importance	How important does the actor find use of integrated data? How beneficial to the goal do they consider it to be? In what way?
Knowledge and skills	Are there any issues with the actor's own knowledge or skills that might impact their deliver? What are they?
POWER OVER (What do we know about how much influence any given actor has to effect necessary change?)	
Historical experience	What is the history of this data use in Nigeria at different levels? How have the actors experienced it previously?
Current events	Are there opportunities for change in this system that were not previously present? What are they? How might they be leveraged?

2.2.5 Limitations

While we aimed to maximize the number of interviews across all types of stakeholders, the national election and change in governments midway through the study affected participation of selected key informants from national government agencies. Additionally, almost all of our key informants were supervisors, managers, or in roles of authority, limiting the potential for analysis of power dynamics from the perspective of actors expected to gather, input, or use data on the front lines of implementation. This is due, in part, to the challenges in reaching and interviewing those individuals at lower levels. Additional interviews were planned but were not feasible because of the change in government. Exploring power issues with this group, including validating these PEA findings, should be incorporated into further learning activities.

3. FINDINGS

3.1 DESK REVIEW OF RELEVANT LITERATURE

Our desk review examined peer-reviewed journal articles, organizational reports, and grey literature from global health stakeholders such as WHO, USAID, and UNICEF to better understand the current status of immunization data monitoring and evaluation in Nigeria. Of 37 resources identified, we reviewed 21 sources, 17 of which were peer-reviewed journal articles; the remaining were organizational documents and reports. The remaining sources were not included in this desk review because they did not meet our selection criteria. The sources were either too broad and did not include enough specific information about the immunization landscape in Nigeria, or they were focused on different areas of immunization programming, such as service delivery and vaccination campaigns, that were not relevant to our research questions. Resources that did not discuss some aspect of data, monitoring, or evidence generation and use were eliminated from the review. Data were extracted from the selected resources and examined for key findings. We found that the challenges facing evidence generation and synthesis for immunization fell into three major categories: data fragmentation and silos, specifically inadequate standardization and disconnected data collection systems across levels of the health care system that complicate accurate immunization planning and tracking; data quality issues, including incomplete and inaccurately entered immunization data that negatively impact the effectiveness of vaccination efforts; and insufficient focus on underlying socioeconomic determinants and unclear accountability of immunization stakeholders that hinder progress in reducing ZD, despite robust funding for vaccine delivery in Nigeria. There is also a notable absence of information on how different levels of immunization data systems interact in the existing literature. More details on the findings on each of these three categories are provided below.

3.1.1 Data Fragmentation and Silos

Data silos and lack of standardization across levels of the health care systems are major barriers to improving ZD rates in Nigeria. A recent landscape analysis from the USAID MOMENTUM Routine Immunization Transformation and Equity (MOMENTUM) Project revealed several important details about how immunization data is currently collected and monitored in Nigeria. In Northern Nigeria, traditional and religious village leaders record the birth of all community members using a paper-based system, which informs future immunization planning. In Abuja and Nasarawa State, community health workers are using the CommCare software platform to track and register pregnant women, but this data is not currently linked with immunization records. Nigeria calculates its target immunization population using the 2006 National Population and Housing Census figures and applying state-specific growth rates for each state and LGA. However, the accuracy of these estimates is limited by the inability to account for inter- and intra-state migration, which significantly affects the size of populations in certain communities.[20] In a brief written for policy-makers and funders, USAID MOMENTUM recommends using geospatial data which can be triangulated with administrative data to generate more accurate microplanning to capture missed settlements according to sociodemographic predictors of ZD. Since 2012, Nigeria, through the GPEI, has established an extensive history of using geospatial technology

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[20] USAID MOMENTUM Routine Immunization Transformation and Equity. 2022. "Landscape Analysis of Health Information Systems and Data Tools for Identifying, Reaching, and Monitoring Zero-Dose and Under-Immunized Children."

to enhance microplanning, monitor polio vaccinations, and provide real-time monitoring. Population counts derived from this technology have proven to closely align with actual figures, leading to more precise program objectives. The counts also revealed that approximately half of the polio cases emerged in the border regions between districts, where health officials were unaware of the precise administrative limits of their health zones.[21] The MOMENTUM brief also suggests that Nigeria and other countries should establish interoperability between information systems and tools at all levels of the health system and that the government should invest in broader health system strengthening and building capacity at the local level in order to reduce ZD populations.[22]

3.1.2 Data Quality Issues

Data on RI is primarily obtained from the DHIS2. All health facilities offering RI provide monthly reports to LGA offices which are entered manually into DHIS2. However, the quality of this data is limited. When DHIS2's RI module was first scaled up between 2014–2017, 60,000 immunization health workers were trained on data collection, entry, and interpretation across the 774 LGAs, with each state having identified at least one DHIS2 focal point for oversight and management.[23] However, high staff turnover has contributed to poor data quality due to mistakes in transcription and summation in health facilities or errors during data entry. Additional challenges include the consistent shortage of paper tools required for initial data collection, and health facility lists that are rarely updated and thus fail to capture the full list of sites providing RI services. Combined, these factors limit the quality of data that can be extracted from DHIS2.

Data on the demographic factors that influence children's ZD status in Nigeria are available and fairly well understood. A number of studies have identified factors that contribute to low vaccine coverage in the country, including the mother's age, education level, employment status, previous use of health services, socioeconomic status, and living in rural/remote areas.[24, 25, 26, 27] The mother's education level was found to be an especially influential factor in children's immunization status in Nigeria.[28] Despite the abundance of data on ZD indicators, low-quality and outdated administrative data on ZD status remains a major issue in Nigeria.[29] For example, measles vaccine campaign coverage is often measured through PCCS data, but this data estimates coverage over a broad geographic area, meaning that inequities at a more granular level are not reflected.[30] Immunization data at the state level is not accurate due to the outdated census data used as the baseline for projections of surviving infants and the application of uniform growth rates that fail to capture differences in population growth at the local

[21] Levine, O. et al. 2018. ERG Discussion Paper 8: Tackling inequities in immunization outcomes in remote rural contexts.

[22] USAID MOMENTUM. How Data Systems Can Help Reach Zero-dose and Under-immunized Children. 2023.

[23] Shuaib F., Garba A.B., Meribole E., et al. Implementing the routine immunization data module and dashboard of DHIS2 in Nigeria, 2014–2019. *BMJ Global Health* 2020;5:e002203.

[24] Adedokun, S. T., Uthman, O. A., Adekanmbi, V. T., & Wiysonge, C. S. (2017). Incomplete childhood immunization in Nigeria: A multilevel analysis of individual and contextual factors. *BMC Public Health*, 17(1), 236.

[25] Adegboye, O. A., Kotze, D., & Adegboye, O. A. (2014). Multi-year trend analysis of childhood immunization uptake and coverage in Nigeria. *Journal of Biosocial Science*, 46(2), 225–239.

[26] Mahachi, K., et al. (2022). Zero- or missed-dose children in Nigeria: Contributing factors and interventions to overcome immunization service delivery challenges. Vaccine, 40(37), 5433–5444.

[27] Sato, R. (2023). Zero-Dose, Under-Immunized, and Dropout Children in Nigeria: The Trend and Its Contributing Factors over Time. *Vaccines*, 11(1), 181.

[28] Mak, J., et al. (2023). Multivariate assessment of vaccine equity in Nigeria: A VERSE tool case study using demographic and health survey 2018. Vaccine: X, 14, 100281.

[29] Dunkle S.E., et al. Limitations of Using Administratively Reported Immunization Data for Monitoring Routine Immunization System Performance in Nigeria. *J Infect Dis.* 2014 Nov 1;210 Suppl 1:S523-30.

[30] Utazi, C. E., Wagai, J., Pannell, O., Cutts, F. T., Rhoda, D. A., Ferrari, M. J., Dieng, B., Oteri, J., Danovaro-Holliday, M. C., Adeniran, A., & Tatem, A. J. (2020). Geospatial variation in measles vaccine coverage through routine and campaign strategies in Nigeria: Analysis of recent household surveys. *Vaccine*, 38(14), 3062–3071.

level.[31] Birth records collected at the local and community levels are not always integrated with immunization data, making it difficult to accurately determine the number, or location, of ZD populations in the country.

A study from CHAI found that the majority of health workers faced pressure from higher-ups to submit data on short notice and that they were given insufficient time to complete data-related tasks.[32] To combat these issues, Nigeria rolled out the RI module of DHIS2 in 2017 to track immunization data, but significant data quality issues soon came to light. These issues largely fall into the technical, organizational, and behavioral categories. Between 2019 and 2021, CHAI supported the development and implementation of a data quality improvement plan in Nigeria, which improved the timeliness of multiple data reporting initiatives in Lagos State.[25] Despite these improvements in reporting timeliness, the accuracy of the data is still not at the level it should be.

In 2022, UNICEF stated that reaching ZD children was a critical mission for them and other funders, including Gavi and WHO, and specifically mentioned the high incidence of measles in Nigeria as a major concern.[33] However, if these organizations do not have access to accurate and up-to-date data on immunization, it will be difficult for them to implement effective ZD improvement measures that target Nigeria's most vulnerable or high-risk populations. One literature review found that in general, research outputs and studies about immunization in Africa have also declined in quality and number since 2014, meaning there is less information to work with.[34] It has been proven that higher-quality data (especially data from innovative sources) leads to improved results, but ZD practitioners lack access to this type of reliable data to influence their decision-making and approaches.[35]

Despite these prominent data issues, there are a number of promising data collection and monitoring approaches that have been used in the past few years that could be useful in identifying and reaching ZD children. During COVID-19 campaigns, CHAI successfully used the Power BI tool to visualize immunization coverage.[36] This tool could be applied in a similar way to monitor RI coverage and identify gaps. Multiple studies have used geospatial data and mapping to help identify/monitor ZD populations and plan evidence-based interventions.[37, 38, 39] Predictive algorithms are a low-cost intervention that can effectively identify ZD children, but only if countries have access to high-quality data and have the technical capacity to generate their predictions.[28] One recent study applied the Vaccine Economics Research for Sustainability and Equity (VERSE) tool to Nigeria's 2018 DHS data to evaluate equity in the county's vaccination programs to identify the most influential factor in determining a child's

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[31] Dougherty, L., et al. 2019. "From Paper Maps to Digital Maps: Enhancing Routine Immunization Microplanning in Northern Nigeria." *BMJ Global Health.*

[32] Miller, S. 2022. Case study: Strengthening data quality for diagnosis, decision-making and implementation in Lagos state, Nigeria. Clinton Health Access Initiative.

[33] Critical Mission for UNICEF: Reaching "Zero-Dose" Children. (n.d.). UNICEF USA.

[34] Haddison, E. C., Machingaidze, S., Wiysonge, C. S., Hussey, G. D., & Kagina, B. M. (2019). An update on trends in the types and quality of childhood immunization research outputs from Africa 2011-2017: Mapping the evidence base. *Vaccine: X*, 1, 100001.

[35] Biswas, A., Tucker, J., & Bauhoff, S. (2023). Performance of predictive algorithms in estimating the risk of being a zero-dose child in India, Mali and Nigeria. *BMJ Global Health*, 8(10), e012836.

[36] Athiyaman, A., Ajayi, T., Mutuku, F., Luwaga, F., Bryer, S., Giwa, O., Mngemane, S., Edwige, N. N., & Berman, L. (2023). Recovering from the Unprecedented Backsliding in Immunization Coverage: Learnings from Country Programming in Five Countries through the Past Two Years of COVID-19 Pandemic Disruptions. *Vaccines*, 11(2), Article 2.

[37] Fullman, N., Correa, G. C., Ikilezi, G., Phillips, D. E., & Reynolds, H. W. 2023. Assessing Potential Exemplars in Reducing Zero-Dose Children: A Novel Approach for Identifying Positive Outliers in Decreasing National Levels and Geographic Inequalities in Unvaccinated Children. Vaccines, 11(3), Article 3.

[38] Haeuser, E., Nguyen, J. Q., Rolfe, S., Nesbit, O., Fullman, N., & Mosser, J. F. (2023). Assessing Geographic Overlap between Zero-Dose Diphtheria–Tetanus–Pertussis Vaccination Prevalence and Other Health Indicators. *Vaccines*, 11(4), Article 4.

[39] Oteri, J., Idi Hussaini, M., Bawa, S., Ibizugbe, S., Lambo, K., Mogekwu, F., Wiwa, O., Seaman, V., Kolbe-Booysen, O., Braka, F., Nsubuga, P., & Shuaib, F. (2021). Application of the Geographic Information System (GIS) in immunisation service delivery; its use in the 2017/2018 measles vaccination campaign in Nigeria. *Vaccine*, 39, C29–C37.

immunization status, which can help plan implementation strategies to increase equity.[22] These tools could be used in combination to gather higher-quality, more accurate data and to model and predict what areas and populations will experience low immunization coverage. Innovative data and monitoring tools could proactively reach those most vulnerable with timely interventions.

3.1.3 Funding and Accountability

Although the government of Nigeria has invested a great deal of money and resources into immunization efforts, the country has not made substantial progress in decreasing the number of ZD children over the past several years.[20] The government, along with funders and partners, are investing in vaccine service delivery and vaccination campaigns but are not investing enough in improving factors, such as socioeconomic status, that are significant indicators of ZD status. In addition to potentially misdirected funding, the roles and responsibilities of immunization stakeholders and policymakers within the government are not well defined or well-coordinated. Lack of accountability at multiple levels of the government is another major issue, as it is unclear who is responsible for meeting immunization goals and targets.[40, 41]

To rectify the current lack of accountability, the government needs to clearly define roles and responsibilities, hold those parties accountable for immunization decision-making, and more effectively track progress being made.[32] One tool that could help increase accountability is the Accountability Framework for Routine Immunization in Nigeria (AFRIN), which "defines roles, responsibilities, timelines, and monitoring and reporting structures for routine immunization…, identifies rewards and sanctions to enforce these responsibilities, and creates a dashboard for monitoring and feedback on key performance indicators within the routine immunization system."[32] However, this tool, which was developed in 2012, had not been operationalized at the state level as of 2018. One 2021 study in Eboyni State examined how knowledge translation (KT) tools could be used to help policymakers contextualize AFRIN in their work at a more localized level. Policy briefs and policy dialogues were found to be very useful in contextualizing the national-level AFRIN measures into more tailored state-level actions.[42]

However, there is a lack of literature on how this framework has been implemented at the state level since 2018 or whether KT tools such as the policy briefs mentioned in this study have been used by the Nigerian government.

3.1.4 Current Gaps in the Literature

An important gap in the literature is the interaction between data and monitoring systems at the local, state, and national levels. While several studies examined the ways that immunization data is collected and tracked at one of these levels, it remains unclear how these systems communicate with each other, if at all. Interviews with stakeholders at each level of the health care system could provide insight into the ways that data is disseminated from one entity or level to another. The AFRIN is cited as a tool for improving accountability for immunization monitoring among government actors, but there are

[40] George, A. S., Erchick, D. J., Zubairu, M. M., Barau, I. Y., Wonodi, C. (2016). Sparking, supporting and steering change: Grounding an accountability framework with viewpoints from Nigerian routine immunization and primary health care government officials. *Health Policy and Planning*, 31(9), 1326–1332.

[41] Ogbuabor, D. C., Ghasi, N., Nwangwu, N., Okenwa, U. J., Ezenwaka, U., & Onwujekwe, O. (2022). Stakeholders' perspectives on internal accountability within a sub-national immunization program: A qualitative study in Enugu State, South-East Nigeria. *Nigerian Journal of Clinical Practice*, 25(12), 2030–2038.

[42] Ogbonnaya, L. U., Okedo-Alex, I. N., Akamike, I. C., Azuogu, B., Urochukwu, H., Ogbu, O., & Uneke, C. J. (2021). Assessing the usefulness of policy brief and policy dialogue as knowledge translation tools towards contextualizing the accountability framework for routine immunization at a subnational level in Nigeria. *Health Research Policy and Systems*, 19(1), 154.

few examples of how this tool is being used or has been used in the past. Future research could work to uncover whether this tool or other similar frameworks have been successfully used to improve accountability in health programs and how Nigeria is working to integrate this framework at the state and local/community levels.

3.2 INSIGHTS FROM IMMUNIZATION STAKEHOLDERS

3.2.1 Key Actors within the System

In Nigeria, the system for immunization delivery, including the generation and use of data, is comprised of actors at a number of different levels, with different motivations, lines of authority, and relationships to each other. Although this system is similar to that in many other countries, the semi-autonomous authority of the sub-national actors and the need for development partners to work, in large measure, independently in those states, makes Nigeria a particularly complex situation.

To unpack this situation, KIIs were carried out with purposively selected immunization stakeholders in Nigeria, including international partners, EPI representatives, and country implementers working at the national level and subnational levels. Participants were recruited purposively to collect the views of a range of immunization stakeholders. All KIIs were conducted in-person in the Federal Capital Territory.

We intended to interview key informants from the organizations listed in Table 3. We were unable to secure interviews with a number of partner organizations despite multiple attempts. Some stakeholders changed due to the recent national government elections which required reinitiating engagement with new stakeholders as key informants. Fifteen stakeholders were interviewed for this study, most of whom were at senior or managerial levels. They use evidence for decision-making but their day-to-day responsibilities did not involve data generation and management.

Table 3. Key Informants Targeted for the Study

Level or type of stakeholder	Organization	Number of interviews
Implementers	AFENET	1
	Christian Health Association of Nigeria (CHAN)	1
	USAID MOMENTUM	1
	AHBN	1
	Sydani	1
	Save the Children	0
	Rotary International	1
	eHealth Africa	1
Nigeria Government	FMOH	0
	Nigeria Primary Healthcare Development Agency (NPHCDA)	1
	National Immunization Technical Advisory Groups	0
	National Emergency Routine Immunization Coordination Centre (NERICC)	0
Subnational Government	Local Emergency Routine Immunization Coordination Centre (LERICC)	0
	State Emergency Routine Immunization Coordination Centre (SERICC)	4
	State Primary Health Care Development Agency (SPHCDA)	2
International Partners	WHO	0
	UNICEF	0
	United States Agency for International Development	1
	Global Alliance for Vaccines and Immunization	0
	Japan International Cooperation Agency	0
	Gates Foundation	0
Total		**15**

The role of each organization in the system for immunization delivery in Nigeria is outlined in Table 4.

Table 4. Organizational Roles in Immunization Landscape in Nigeria

Organization	Role of organization in immunization landscape
AFENET	• Worked with NPHCDA to introduce an SMS platform for reporting RI data, which is currently operational across 18 states and enables NPHCDA at the national level to view and analyze data weekly and provide feedback to the states.
eHealth Africa	• Supported the NPHCDA in the development of the Electronic Management of Immunization Data (EMID) system, initially for the rollout of the COVID-19 vaccine, including vaccination scheduling, real-time data entry, as well as the collation, analysis, and validation of client data. An integrated RI module was piloted in select states through EMID and was recently launched to all states. • Developed the Logistics Management Information System application that allows last mile health workers to receive information stock management.
Sydani	• Provides advisory and technical support to NPHCDA in adapting global immunization frameworks to the Nigeria context. • Analyzes and visualizes data from the DHIS2 and the quarterly PAPA-LQAS surveys to help decision-makers in government.
AHBN	• Worked with NPHCDA to lead capacity-building interventions in the 36 states on finance management, particularly the Basic Primary Health Care Provision Fund. • Advocates for greater health spending, accountability, and transparency, including helping ensure the Nigerian government executes its co-financing commitment for investment in immunization, and for funds to be released in time.
CHAN	• Works to identify ZD in hard-to-reach and fragile settings. • Developed microplans in two LGAS in Plateau and Borno and plans to develop additional microplans in Sokoto and Amba to help inform strategy for identifying and reaching ZD. • Plans to develop and deploy CommCare module to capture georeferenced data on ZD who are being reached by community health workers.
MOMENTUM	• Provides advisory and technical support to select state governments in stimulating demand and establishing crucial linkages between communities and health care facilities through sensitizing influential community figures, such as traditional barbers and community health influencers and promoters, to refer children to these facilities. • Reviews microplans and provides state-specific population estimates of children under five by using the ZD calculator developed by the University of Southampton in collaboration with NPHCDA.

As described above, analysis of the interview data was conducted in two phases. The first examined in particular the political backdrop for immunization programming, including funding and resource allocation, stakeholder perceptions of data quality, and how that impacts data use. Subsequently, transcripts were re-analyzed to extract more information about the relationship between stakeholders and the power dynamics and various incentives driving decisions and actions. The power dynamic analysis consisted of four key domains; findings for each are described below.

3.2.2 Perceptions of "Power to" Use Data Effectively

The first domain of power explored was "power to" which examined whether or not stakeholders felt that the right people had the right level of authority, control, and access to generate and use data as expected. Within this domain, a number of aspects were examined including access, laws and policies, explicit channels of authority, and incentives (both explicit and implicit).

Accessibility

In general, stakeholders felt that there was extensive data on immunization accessible, although many also emphasized that most readily available data is at the health-facility level, which means it is not immediately helpful to identify or monitor reaching ZD children at an individual level. Further, most noted that accurate data for ZD is severely limited, because the key denominator in identifying and reaching ZD children using routine data as a starting point is an accurate census, which does not currently exist. As such, data must be actively generated through a process of intensive community work, for which there is not always time or resources. These constraints severely limit true power to use data to better serve ZD children effectively, despite an extensive landscape of data and a culture of data use for more routine services.

As for routine services, it was clear from the interviews conducted that there **is** extensive access to data and a sense of power to act on it to ensure seamless stock, identify programming gaps, and implement catch up campaigns. For many stakeholders, there also appears to be a sense of pride around these extensive systems for data; isolating challenges with access to ZD specific information often took prompting. However, this data landscape is often confusing, with different actors controlling different elements.

Within NPHCDA, the NERICC is responsible for managing immunization data and processes, and it works through its counterparts at the state and local levels, the SERICC and LERICC to collect and report RI data through the SMS platform daily and DHIS2 monthly. All stakeholders across organizations and levels of government mentioned having access to administrative data on DHIS2 and mentioned the improved accessibility in recent years.

> *"There used to be different administrative data in the past. You couldn't blame stakeholders, since they did not have access to the government-owned DHIS2. As the multiplicity of administrative data continue to grow, the NPHCDA and its technical working group had to provide access to all stakeholders working on RI."* -KII, implementing agency

Data from the Routine Immunisation Short Message Service (RI-SMS) and PAPA-LQAS are warehoused with NPHCDA, and access is not available to other external stakeholders. However, quarterly reports summarizing findings from the PAPA-LQAS are developed and shared with stakeholders at the national level, though these reports do not always trickle down to the stakeholders at the subnational levels.

"Data reporting is limited to the level of the federal government and partners. Hardly, do we see a simpler or state - specific data shared with us. Well, maybe it's not the federal fault, it might mean that we are also not requesting for this information." –KII, subnational government

For immunization campaigns including Periodic Intensification of Routine Immunization efforts and SIAs for measles, malaria, polio, and non-polio campaigns, the warehousing and accessibility of the data is not straightforward and depends on the specific campaign and the involvement (or lack thereof) of the three tiers of government. Some campaigns are planned and funded at the state level, with little to no coordination with the national government which, in turn, hampers the accessibility of data collected as part of the campaign. One respondent further elaborated that some sponsored campaigns circumvent health facilities altogether and go directly to communities. The data collected as part of these campaigns is not shared with facilities or integrated into existing data systems; it is warehoused by the campaign implementers and, if used for purposes beyond that campaign, used only by them.

"At NPHCDA, there are outreach activities and campaigns which are carried out to generate zero-dose data at the state level. During these exercises, information is captured into DHIS2. The same cannot be said when states carry out their campaigns. Either it doesn't get to DHIS2 or it gets into DHIS2 at a later date." –KII, national government

"Though we are trying to harmonize outreach campaigns—whether that is possible is another thing to think about—not knowing when state campaigns happen means we don't reach out for data collected during those campaigns. This is why it's important to monitor the Outreach Service Support that has been assigned for the states." –KII, national government

Stakeholders from international partners and implementers explained the various roles they play in supporting the Nigerian government carry out different immunization initiatives. These roles, summarized in Table 4, encompass diverse functions such as digitizing and optimizing RI and commodities management and offering technical assistance to government actors on various topics that range from budgeting to microplanning. Almost all stakeholders interviewed indicated that they do not collect or house primary data on immunization; rather, some of them support and facilitate the government's capacity to collect or analyze immunization-related data which includes administrative data through DHIS2, SMS, periodic survey data including PAPA-LQAS, and financial data. Pending interviews with international partners, including WHO and UNICEF, will likely yield additional perspectives.

When asked about the availability or accessibility of ZD data in Nigeria, one implementer responded that such data are not collected in any systematic way, but that NPHCDA, along with FMOH, UNICEF, and others, is leading efforts to design a MINI Multiple Indicator Cluster Survey (MICS). This is based on the national UNICEF MICS methodology[11] but adopts larger sample sizes to allow for more precise measurement of children who have not received the first dose of DTP at the LGA level. Another potentially useful but underused tool mentioned by several respondents, including SERRIC project managers in Bauchi, Borno, Kano, and Sokoto, is the Routine Immunization Supportive Supervision (RISS) checklist, which is operated by states through Open Data Kit (ODK), software that is free and accessible on mobile phones. The RISS consists of one section with questions focused on facility operations, data reporting, and provider competency and a second section designed to be filled out at the community level. Once the facility portion of the checklist is completed, the health worker is expected to travel to one settlement within the catchment area of the assessed health facility, visit 10 households with children within a specific age cohort, and record the vaccination status of each. In reality, supportive supervision efforts are focused on the facility, neglecting the community visits for various reasons that include lack of transportation and/or funding. One implementing partner respondent underlined this as a missed opportunity, stating that "there are no ZD in a health facility; the ZD are in the community." Aside from health workers often skipping the section of the RISS that requires them to visit the community, data from this tool are kept by subnational governments and not accessible to stakeholders.

Additionally, a respondent from CHAN elaborated that the organization plans to collect geo-referenced data on ZD as part of their efforts to identify and reach unvaccinated children in hard-to-reach and conflict settings, with the goal of making this data available to the local government to revise microplans and improve targeting to reach ZD. However, it is unlikely that this data will be integrated into any existing health information system.

Laws and Policies

Existing laws and policies around data generation, use, and sharing along with the general political backdrop against which immunization is being delivered also affect various stakeholders' power to use data effectively. In Nigeria, KIIs noted that the vast majority of attention, priority, and focus is on RI and immunization for children under two and the health and well-being of that same age cohort, in large measure due to historical donor priorities and investment in those areas. ZD children are often outside this age window and overlooked. Different government agencies and levels of government also have different policies that guide operations, initiatives, and reforms, and the independence within each tier of government means there is little accountability between them, fragmenting funding and reporting.

Vaccination initiatives, much like other public health programs, rely on the decisions made by elected leaders. Given Nigeria's governmental structure, progress and achievements in immunization programming must be accomplished between elections, as the election of a new candidate effectively pushes the 'reset' button, forcing stakeholders to begin anew in coordinating and collaborating with the newly elected officials. Progress made under one leader's governance is susceptible to decline once a new leader assumes office, particularly when the new leader is of a different political affiliation than the incumbent.

"It does not matter how the policies came about or what achievements have been made. Once there is a new government, implementation of RI-related policies changes in our state, and renegotiation with international partners start afresh." –KII, implementing agency

Nigeria's current political transitions at the federal and state levels provide real-time examples of these shifts and their implications. At the federal level, a new president was elected in early 2023. Given that he is from the same political party as the incumbent, major changes in governmental policies (including immunization) are not expected. Nevertheless, new leadership is expected in the NPHCDA and NERICC, the agencies focused on strengthening health systems, including RI.

The state tier has 18 new governors and ten returning governors as a result of the 2023 elections, with some governors representing different political parties than the incumbent. Kano and Plateau, two of the 18 NERICC states with a high number of LGAs where ZD reside, have elected governors who are both new to the post and represent a different political party than their incumbents. As a result, these states are more likely to experience significant shifts in immunization programming, including in policy, implementation, service delivery, human resources, and funding. Respondents generally agreed that the political trajectory of the state determines how resources are distributed and their commitment to health and immunization, the availability of funds for outreach programs, and overall quality of immunization services. For example, states where the newly elected governors are from the same party as their predecessors are more likely to allocate resources for RI, especially if that was the existing policy before the election.

Table 5 shows the combination of leadership and political party changes following the 2023 elections in seven states, three of which (Borno, Kano, Bauchi) are among the Nigeria CLH target states.

Table 5. Political Changes at State Level after 2023 Elections

State	Governor	Political party
Borno*	same	same
Kano*	new	different
Bauchi*	same	same
Jigawa	new	same
Kaduna	new	same
Plateau	new	different

*Nigeria CLH target states

Authority, Decision Making, and Accountability

Another aspect of a particular actor's power to act, using data effectively, is whether that actor has the appropriate authority, decision making responsibility and accountability for those decisions. In Nigeria, respondents noted that the federal, state and local governments operate independently from one other, with no clear lines of reporting or accountability, which makes planning and coordination for immunization programming a challenge. Each tier of government has its own set of priorities, which often shifts based on the political party in office.

"For any program to be successful, there should be coordination between the three tiers of government. But since I'm not reporting to you, I cannot be held accountable by you. You understand? And if you bring your own ideas, I have the liberty constitutionally to agree or to not agree. That silent push back of federal initiatives impacts programs. The federal government will look at something from one angle and say, "this is how we are supposed to do it;" the state has a different context." –KII, implementing agency

This persistent lack of coordination amongst the federal, state, and local government tiers in Nigeria can lead to fragmented funding and challenges in accessing consistent and coherent data, which encourages decision-makers to ignore the use of data in policymaking. Decision-makers generally understand that existing data quality is poor, and they find it difficult to rely on such data. At other times, policymakers make decisions hastily without referring to the close-to-good data that is available. Challenges mentioned by respondents include friction in data management processes between the decision makers at the three arms of government and the inadequate knowledge of data management and processing.

Additionally, the local government tends to operate independently of the state and the federal tier. Likewise, the state government acts independently of the federal tier and vice versa. For example, NERICC holds ad-hoc meetings with SERRIC. The latter, in turn, meets with LERRIC to discuss funding. Oftentimes, data collection coordination or data management processes are not discussed, even during ad-hoc meetings.

"Of course, each RI committee meets often, but I am not sure if we have had a meeting with NERICC this year. It is only when there are emergencies like the Diphtheria outbreak that we hold joint meetings." –KII, subnational government

At the federal tier, where NPHCDA and NERICC sit, the use of data for policymaking has improved. Respondents generally agreed that this would be nearly impossible without the help of different international partners working around improving rapid immunization. Yet with more international

partner support comes different data collection and reporting requirements which makes the task of triangulating data for decision-making more difficult. Further, the presence of many different partners also creates additional challenges in lines of authority and accountability, as those partners often compete to be heard or to offer their particular solution or expertise.

Incentives

The various stakeholders in the immunization ecosystem in Nigeria all operate with different sets of incentives and constraints, contributing to a complex web of motivations.

Implementing partners, for example, are often constrained by funding or donor priorities and rewarded or incentivized to achieve those targets. These priorities are frequently established outside Nigeria and do not always align with the government's own priorities. Different partners also have different priorities and at times are subtly competing for attention or focus from various government agencies. The partners' own generation of data is sometimes perceived as undermining the government systems, and the locus of control or power over data within the country stays with the partner.

"People are smiling and waiting while you do whatever you want to do but understand others will come—we are unable to co-create solutions. You cannot come from outside and tell me where there are leaks in my roof." –KII, subnational government

For Nigerian health system workers, respondents noted that these individuals are not development professionals, per se. They are performing a set of duties for which compensation is critical. They do what they are paid to do, and most do not go above and beyond simply to help. When one program pays additional resources or allowances for a particular task or function, that program will get priority. This has been true, for example, with the polio eradication campaign, which came with extensive benefits, support, and resources for actors at all levels, including community leaders. The lack of such incentives, currently, is possibly creating a vacuum of commitment.

For ZD data in particular, the front-line agents, including the community health workers and their supervisors, are the lynchpin to having the necessary data in the right systems. Yet, this cadre is the least compensated and supported, and the community aspect of the work is often nearly impossible with work-loads and expectations at the facilities.

For state and national government actors, incentives also vary. The Nigerian national budget includes allocation for vaccine procurement on an annual basis, with the national government contributing a larger share of the funding compared to the state and local levels. The national government secures the funding and procurement with support from the Vaccine Independence Initiative. UNICEF and other partner initiatives cover financial resources when the national government experiences temporary budget shortfalls.

> *"Vaccine availability has been a constant, and we don't think there will be a change in budgeting for vaccines, either internationally or those procured locally. With support from partners, we now have dedicated funds, even when there are shortfalls. The only challenge could be when funds are released for the procurement, since vaccine procurement is not yet a first line charge."* –KII, national government

Respondents mentioned several enabling factors that might incentivize the appropriate allocation of funding to RI, including the institutionalization of a state health task force, a health data governing council, or the pay-per-contribution method used by the Gates Foundation and Dangote Foundation in some states.

> *"In states that have signed memoranda of understanding on improving rapid immunization with BMGF and Dangote Foundation, a multi-stakeholder task force has been responsible for allocation, monitoring, outreaches, and accountability of funds. This initiative is making the states to comply with their counterpart funding for rapid immunization."* –KII, subnational government

In states where the internally generated revenue is low, available resources compete between education, health, community empowerment issues, and other development areas. There is a risk of noncompliance with counterpart funding agreements with the federal government or agreements with international partners.

> *"When it comes to financing, there's still a significant gap that needs to be addressed, including resource mobilization, especially at the state government. Even when states are expected to contribute their share of funding for RI at the state or national level, it's evident that these contributions are often delayed or insufficient."* –KII, implementing agency

In states where there are available resources but childhood immunization has not been prioritized, disbursement of funds for RI may be delayed.

> *"There is bureaucracy in approval of funding disbursement across different levels of implementation—that is, from the governor to commissioner of finance to accountant general to SPHCDA to LGA to the PHC level."* –KII, subnational government

Continuous advocacy to enhance and encourage the government at different tiers to budget for immunization programming influences the allocation of resources. Respondents mentioned that advocacy efforts should be intensified during budget preparation. They also mentioned that when advocacy meetings include short, simple "data speak" sessions, government officials can easily relate and buy in to provide funding for rapid immunization.

"Before now, we used to carry out advocacy activities with the executive arm of the state once in a while. We realized we were not getting the needed results. In one of the states, we changed the meetings to monthly with a few presentations, and we started seeing the curiosity of the finance arm of the executives. We intensified the advocacy during budget planning and we found it worked." –KII, implementing agency

The effects of this kind of advocacy and accountability can ensure consistent funding, even when there are political shifts. In Kano state, for example, there has been consistent funding for RI since 2012, despite governorship change amidst three different political parties. Currently, state support has reached 100 percent of target funding.

"As it concerns rapid immunization in Kano State, the state government provides 100 percent of the funds. Though releasing of the funds might happen later than expected, a budget allocation of over 400 million goes into rapid immunization." –KII, subnational government

3.2.3 Perceptions of "Power With"

A key aspect of an actor's power to use data effectively is how supportive the system in which he or she is acting is. Known as "power with," this can include informal, peer support as well as more formalized institutionalized support and collaboration between and among various stakeholders. It also encompasses any gender dimensions of power as well as norms around the use of data for decision making.

Institutional Support

The overarching system of support for actors within this system is confusing, inconsistent, and crowded, with overall weak coordination and collaboration. At the state level, where SPHCDA and SERRIC oversee RI, challenges remain in triangulating data and ensuring staff have the resources and skills needed for data-driven decision-making. Multiple implementing partners working on similar issues in the same geographic areas can create unhealthy competition and obstacles to accessing and using existing data effectively, especially when staff at the state level are inexperienced in data triangulation.

There is limited coordination between policymakers in the legislative and executive branches at both the federal and state levels. When the executive arm cannot curate accurate data for legislatures to use in policies around funding or RI implementation, legislatures are reluctant to make decisions on urgent RI issues. Similarly, legislatures at both levels of government have weak monitoring systems to track disbursed funds and collect data on progress for accountability and policy development.

"Recently, the Kano state government instituted a policy that limited immunization-related outreach and campaigns to communities and settlements that are several kilometers from health facilities. Meanwhile, data shows that people living around health facilities are the ones who don't visit health facilities." —KII, implementing agency

At the facility level, workers who are tasked with collecting community-based data often do not, as their primary role is to serve the facility. Their supervisors are also focused on facility-based needs and priorities and there is little support, including as part of quality control or supportive supervision efforts, to expand this vision.

Social/Peer Support

Because the primary set of respondents for this analysis included those in managerial or supervisory roles, rather than the actual generators or users of data at the local government level, the perception of peer support was not fully explored in this analysis and should be further examined in future learning. All respondents expressed a commitment to improving data use to better reach ZD children, recognized their role in addressing challenges and driving progress, and appeared to be supportive of others doing so as well.

Gender

Gender was not expressly mentioned as a factor in any actor's data use of data. Some respondents did mention that the "last mile" participant in the immunization system is often a child's caregiver, who is typically a woman. Additionally, the persistence of ZD in some communities is influenced by women's roles, decision-making authority within the household, and commitments to labor outside the home, which can make care-seeking a challenge. These factors, however, were not discussed in relation to data generation or use.

Norms

Norms are often one of the strongest predictors of behavior in a given context, including an individual's willingness or power to act differently than what is standard or typical. However, the specific norms around use of data were not well-described by the set of respondents. There does appear to be a growing culture of data for decision making, a recognition that data is a necessary part of quality services, and increasing public discourse on how to improve it. There is also a strong movement towards digitization of data to improve quality and timeliness, but a few respondents noted that certain stakeholders who collect data are not technologically savvy nor do all health workers want to use digital systems.

3.2.4 Perceptions of "Power Within"

The third domain, "power within," explored stakeholders' internal capability or self-efficacy in using data appropriately. This specifically examined perceptions of quality or relevance of data to their work, perception of the importance of data itself, and whether or not stakeholders have the necessary knowledge and skills to use it effectively.

Quality and Relevance

Most respondents emphatically noted that the lack of confidence in the data that does exist makes stakeholders unlikely to use it on a regular basis, and most did not express willingness, interest, or confidence in their own capacity to change or improve this quality.

Specifically, respondents noted that even when data are readily accessible, information collected through DHIS2, SMS, PAPA-LQAS, and periodic surveys do not generate community-level or district-level information on the number or whereabouts of ZD children. With census data in Nigeria dating back to 2006, several respondents highlighted microplanning as an essential step in effectively identifying and reaching ZD, while simultaneously calling attention to its shortcomings. One respondent stressed that all estimates of ZD in Nigeria are just that—estimates that might be painting a picture significantly different than the reality. As the respondent explained, the federal government and NERICC have taken a top-down approach, working with the University of Southampton to estimate the total number of ZD in Nigeria by extrapolating various data sources, including administrative and campaign data, but these estimates do not go below the state level. On the other hand, the local governments have taken a bottom-up approach, creating microplans at the community and ward levels. But even this approach is rarely comprehensive, as stakeholders are not always able to do a "walkthrough" of the community, either because of time and budget restrictions or limited or no access to certain communities due to security reasons. Often, these are the communities most at-risk for having high concentrations of ZD.

> *"Looking at the consensus data within the NERICC, you will notice that the consensus data does not have the granular data to the ward level and the community level. However, in the different states, the approach for microplanning is from bottom to top, but even that is not adequate to tell us the exact number of zero-dose children in those communities. That is one of the major problems with the zero-dose identification and zero-dose program implementation."* –KII, implementing agency

Respondents also mentioned data quality concerns related to the immunization service delivery data captured in DHIS2, including timeliness and accuracy. The lack of sufficient and knowledgeable staff and high staff turnover were cited as major contributors to this problem. National government stakeholders expressed hope that the recent deployment of EMID for RI might solve some of these challenges.

> *"Obtaining real-time data was a significant challenge, particularly in the past when routine immunization data was reported monthly. The delay in data availability hindered quick decision-making and problem identification."* –KII, implementing agency

Perception of Benefit or Importance

Although not explicitly addressed by study respondents, there was an implicit awareness and understanding of how important having the right data at the right time is to finding and serving ZD children in the country. Despite the intricacies of the system for routine data and the vast complexities of the Nigerian health system, the importance of data was a strong and consistent theme in the analysis.

Knowledge and Skills

Most of the respondents expressed confidence in their own expertise to do their jobs. However, many also noted gaps in capacity for those supposed to be generating and using the data further down the system, especially as effectively using data for ZD children requires manipulation and extraction of routine data. In general, respondents felt that this triangulation process requires a considerable level of sophistication in data manipulation, which steadily reduces as one moves from the federal to the local tier of government. The government has limited understanding of the capacity building needs of key subnational EPI staff who manage and process data on a regular basis.

> *"In data process management across the value chain of rapid immunization, and specifically zero-dose data, the ward focal point, who is responsible for collating data for LGA/state use, is nearly invisible in several interventions. Their level of understanding of data quality and data integrity can be questionable most times. They are a very important element in this value chain, but we ignore them during capacity building planning."* –KII, subnational government

3.2.5 Perceptions of "Power Over"

The analysis framework we applied included a fourth domain, "power over," which includes an examination of how much influence any given actor has to effect change, both historically or within a set of current events. However, because this analysis was applied to existing interview data, and our original interview questions did not thoroughly explore this domain, it is not possible to give a full picture of the findings. Data did suggest that there is historical precedence for change and growth, as new technology and approaches are routinely integrated and adopted, and there is increasing attention to reaching ZD children. Data also suggest the larger cohort of ZD children post-COVID has increasingly taxed the system, making individual actors feel less empowered to change it. Some respondents noted that decreased access and efforts to maintain coverage during COVID has resulted in a cohort of missing children who are now older than two years, aging them out of many of the typical systems that had previously been used to find them. This has the potential to further overwhelm the system, making the issue even more urgent.

4. CONCLUSIONS

The initial PEA findings informed a preliminary learning agenda for ZD programming and evidence generation in Nigeria. The learning questions and mechanisms for data collection and uptake were validated with input from immunization stakeholders during a learning agenda prioritization workshop facilitated by the Nigeria CLH in December 2023.

4.1 KEY CHALLENGES TO RESOLVE

The PEA study explores the interactions, decision-making dynamics, and political context of the different actors central to immunization and ZD targeting and programming efforts in Nigeria. The PEA highlighted several challenges that must be overcome to complete this work, including the following:

Political Participation and Commitment

Political factors have limited the ability of immunization stakeholders to identify and reach ZD children and missed communities in Nigeria. These political factors include the neglect of RI in favor of polio campaigns as a result of the high interest and financial investment of international and donor organizations in the eradication of polio; continuous lack or shift of responsibilities for funding PHC services and RI between the federal, local, and state governments; lack of accountability within the government for meeting immunization targets and poor enforcement of acts governing RI; and the frequent turnover of leadership.

Data Fragmentation

In Nigeria, immunization data is primarily obtained from DHIS2 and SMS. Other sources include the NDHS, PAPA-LQAS, MICS/NICS, and WHO and UNICEF Estimates of National Immunization Coverage (WUENIC). However, this data is not used effectively for planning and coordinating interventions. Data at local, state, and national levels are often collected and hosted on different, unintegrated platforms. There is no synthesized reporting on immunization data, making it difficult to get an accurate picture of the ZD landscape and where gaps in coverage remain.

Data Quality Issues

Data on RI is mainly obtained from the administrative system (DHIS2). All health facilities offering RI provide monthly reports to LGA offices, and the reports are manually entered into DHIS2. However, the quality of this data is inconsistent and sometimes poor. LGA monitoring and evaluation officers cannot obtain complete data from the facilities because PHC personnel fail to fill out the health management information system paper tools. In addition, the data obtained from the facilities is sometimes incorrectly entered into DHIS2 due to attrition of trained staff at LGA levels. Combined, these factors limit the quality of available data.

Limited Use of Data for ZD Programming and Policies

Data use and coordination are ongoing challenges to support ZD funding and programming with little improvement in recent years. This is apparent in the ongoing challenges in accessing and sharing DHIS2, RI-SMS and PAPA-LQAS data with primarily stakeholders at the national level. One of the reasons Nigeria still struggles with achieving its ZD target is the limited use of data within and across levels because of fragmented data systems and poor data quality. This results in poor resource allocation which in turn impacts the quality of strategies, policies, and programs implemented to reduce ZD children.

Ineffective Monitoring of ZD Programs and Coverage

Nigeria has struggled to develop a standard and effective monitoring and evaluation system for ZD programs. Planning and monitoring remain ineffective due to fragmented and inaccurate data, particularly from community and ward levels, where insufficient capacity and resources hinder data collection. Limited supervisory oversight in this area compounds the issue. A structural shift in resources and capacity is necessary to strengthen data collection at the ward level. A standardized approach to collecting and combining data needs to be developed and made available through a centralized platform to effectively monitor these programs. This will establish standards for measuring data and provide clear indicators to evaluation progress.

Release of Funds for Financing

While Nigeria has dedicated ongoing funding for immunization campaigns and vaccine supplies, more funding is needed at the local level to support health facilities to improve RI. Study respondents generally noted the need for local funding and capacity building to improve services in low-income communities, recognizing that that low socioeconomic status is a major contributing factor to ZD status.

4.2 RECOMMENDATIONS

Recommendations from this PEA can be grouped into three areas: 1) improve quality and reliability of the data about ZD children, 2) improve coordination and collaboration between different levels of government and partners using that data, and 3) improve sustained financing and commitment to ZD programming.

Quality and Reliability

Specific recommendations to improve the quality and reliability of the data include:

1. While geospatial mapping and GIS-enabled tools have been effective in Nigeria's polio eradication efforts, their use for RI, including ZD programming, has remained siloed and fragmented. The integration and scale-up of geospatial technology in RI and other health service programs requires a sustained financial investment, coupled with robust government leadership and involvement in the collection, management, and updating of geospatial data. Geospatial technology should be considered alongside administrative data to refine microplanning, improve population estimates, and monitor RI efforts.

2. In many places, artificial intelligence (AI) is increasingly being used to do some of the intensive work of program monitoring, including mining different data sets to identify patterns, inconsistencies, and key factors like product availability critical for quality service delivery. These applications should be explored in Nigeria to facilitate more streamlined use of the many data sets and levels of data available.

3. Improving interoperability and harmonization between different data sets and databases should also be explored. Because of the many different partners and levels within the Nigerian context, ensuring open access and easy triangulation of data between data sets is critical to maximizing their use.

4. Workforce development and capacity at all levels should also be prioritized, with an emphasis on the community and ward levels and a focus on simple tools to support data collection, analysis, and harmonization of micro- or programmatic-data with more population-based data systems. Data from the community and ward levels are essential to improve and update population estimates at those levels and identify, reach, and track the target population for immunization. Systematic incentives for community-based providers should be considered as well. This requires addressing the current gaps in capacity and resources by reallocating or increasing support at these levels.

Coordination and Collaboration

Specific recommendations to improve coordination and collaboration include:

1. Stakeholders from country implementing agencies noted the numerous parallel committees and partnership meetings focused on ZD in Nigeria. These stakeholders should collectively determine which meetings are most useful and discontinue the others.

2. Greater effort to include state or subnational government partners in coordination meetings is needed to account for their needs, priorities, and limitations.

3. Detailed data sharing and discussion is not always a part of coordination meetings, limiting identification of data needed and use of available data. Data sharing should become a key agenda item for all meetings, including RI update meetings, and decisions related to data sharing and use should be documented and followed up on regularly.

Sustained Financing and Commitment

Specific recommendations to improve financing and government commitment to ZD programming include:

1. To make sustainable progress towards closing Nigeria's immunization gap, the government needs to invest more in strengthening health systems rather than vertical immunization campaigns to address ZD. Overall, RI should be better integrated into existing PHC services to improve immunization coverage, including a stronger emphasis on immunization within continuing professional education and supervision for providers.[2] At the state and federal levels, the government should provide funds for establishing mobile vaccine clinics to address the issue of remote areas' lack of access to vaccination services.

   Implementing partners should be supported to work closely with the government on identifying opportunities to mobilize resources necessary for these efforts. Routine advocacy strategies

should be improved and designed to target politicians at the national assembly and the state house of representatives. At the subnational level, in the short term, advocacy efforts should be strongest at the beginning of the budget cycle but continue throughout the budget cycle. In the long term, advocacy with the legislative and executive offices should focus on making vaccine procurement a direct line charge to avoid the bureaucracy of fund releases for vaccine purchases.

2. The AFRIN is cited as a tool for improving accountability for immunization monitoring among government actors, but there are few examples of how this tool is being or has been used. Future research examines whether this tool or other similar frameworks have been successfully used to improve accountability in health programs and how Nigeria is working to integrate this framework at the state and local/community levels to monitor and drive increasing commitment.

3. It is likely pockets of ZD children will persist for certain populations, including those of lower socioeconomic status and educational levels. More effort should be placed on meeting the needs of these populations, including appropriate counselling during antenatal care, incentivizing vaccination, and building community support, as well as exploring opportunities to layer PHC, including immunization, within economic development activities.

4.3 CONCLUSION

This PEA of ZD immunization strategies in Nigeria highlights the intricate interplay of data management, political will, and stakeholder dynamics in addressing public health challenges. This report underscores the critical importance of improving data integration and quality, enhancing coordination across governmental and organizational levels, and bolstering political commitment to effectively target and reduce the number of ZD children. The findings provide a foundation for informed policy-making and strategic planning, alongside the prioritized ZD learning agenda questions and mapping of relevant data sources. They will also inform other activities planned by the CLH, such as decentralized immunization monitoring and implementation research. With focused efforts on these fronts, Nigeria can make significant strides towards achieving equitable immunization coverage, ultimately reducing the vulnerability of its youngest population to vaccine-preventable diseases.

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ANNEX 1: CONSENT DOCUMENT

INTRODUCTION AND INFORMED CONSENT

Political Economy Context of Childhood Immunization in Nigeria

Good morning/evening, my name is _____ and we are here on behalf of John Snow International, and Gavi. We are carrying out a study on "Political Economy Context Surrounding Evidence Use for Zero-Dose Programming and Policies in Nigeria" carried out by JSI and funded by Gavi, The Vaccine Alliance.

In this study, we will discuss with you points about the collection and use of data for immunization programmes focusing on Zero-dose children in Nigeria. These discussion points will help to gain a better understanding of the political and economic context of childhood immunization in Nigeria with a specific focus on zero-dose children. This will help improve implementation of immunization programmes targeting zero-dose children in similar countries or similar settings. We will also be collecting information from other international, national, regional, and local stakeholders for these purposes.

This discussion may take about 45 minutes to one hour to complete. Whatever information you provide will be kept confidential. We will record and take notes during our discussion to avoid missing any information. The recording will be transcribed electronically. Participants' names and other identifying information will be redacted in any resulting reports or publications or when shared with anyone outside the study team. Participation in this discussion is voluntary and you can choose not to answer any question or all the questions. However, we hope you will participate in this discussion since your participation and input are important.

Currently, would you want to ask me anything about this study? [Answer any questions and address the respondent's concerns.]

In case you need more information about this study, you may contact the study leads in Nigeria:

1. Dr. Patrick Nguku, Nigeria Zero-Dose Learning Hub Project Director, Email: pnguku@afenet.net

2. Oludotun Babayemi, Lead Qualitative Research Consultant, Email: oludotunbabayemi@cloneshouse.com

May I begin the discussion?

Respondent agrees to participate _____ 1 [Start Discussion]

Respondent did not give consent _____ 2 [End the discussion]

ANNEX 2: KEY INFORMANT INTERVIEW GUIDES

Note: This interview guide will be adapted to the type/level of the stakeholder; not all questions will be relevant for all key informants.

Introduction *[Can read from consent form]***:**

1. Start with a warm greeting and introduce yourself as the interviewer.

2. Explain the purpose of the interview: to conduct a political economy analysis regarding the issue of generating and using data for identifying, reaching, managing, monitoring and advocacy (IRMMA) for zero-dose children.

3. Emphasize the importance of understanding the underlying political and economic factors that contribute to the problem and our interest in gaining insight into the dynamics at play when it comes to decision making regarding data for IRMMA of zero-dose children.

4. Assure confidentiality and inform the interviewee that their responses will be used for research purposes only.

Demographic Information:

1. Request basic demographic information about the interviewee:
   a. Name
   b. Occupation/role
   c. Affiliation
   d. Years of experience

Background Questions:

1. Can you tell me about **the type of data** you or your organization collect and use for identifying unimmunized or zero-dose (ZD) in Nigeria and **how** you use it? [Note: probe on data used for reach, management, monitoring AND advocacy if different sources.]
   a. How do you collect this data and what system do you use for data management?
   b. What data elements do you collect?
   c. How often do you collect this data?
   d. How do you use this data?

2. What are some of the main achievements that have been made over the last 5 years regarding collection and use of data to inform ZD-related programming and policies? [Note: ensure the impact of these achievements on programs/policies is clearly stated]

3. What are some of the challenges you face in accessing and using existing data to inform ZD-related programming and policies? [Note: customize question to audience – if working on policies or programming or both]
   a. Follow up: What do you perceive to be the main reasons for these challenges?

4. What are some of the challenges you face in collecting data to inform ZD-related programming and policies? [Note: customize question to audience – if collecting data and working on policies or programming or both]
   a. Follow up: What do you perceive to be the main reasons for these challenges?

5. How do you think political and economic factors contribute to the challenges you mentioned earlier for both data collection and use/uptake?
   a. Probe: resource allocation, leadership and governance for data collection and use of data, adequate staffing/human resources. [Note: if only answers about use or uptake, probe about data collection challenges if applicable.]

6. Are there any specific programs, guidelines or protocols in place to guide data collection and use for ZD? Can you describe them briefly?
   a. Follow up: Are there specific agreements or guidelines for data sharing across government agencies, organizations and projects working in Nigeria?

7. How do you think political and economic interests influence the prioritization and allocation of resources for data collection and use for ZD policies and programming?

Factors Influencing Political Economy:

1. Are there any political interests or pressures that affect the allocation of resources that can be used to generate and use data on ZD in Nigeria? How do these political interests or pressures differ at the national and subnational levels?

2. How do political relationships or affiliations impact the generation, sharing or use of data related to zero-dose children?

3. Are there any economic considerations that affect the availability and accessibility of vaccines for children?

4. Can you provide any examples of instances where political or economic factors have hindered collection or availability of immunization data or access to it, leading to inequitable outcomes?

Stakeholders, Power Dynamics and Decision making:

1. Who are the key stakeholders involved in all parts of the data cycle for childhood vaccination programs in Nigeria? [Note: Probe on data collection, processing, analyzing and reporting and by national and sub-national levels and for special populations, like refugees, etc.]

2. How do these stakeholders interact with each other in terms of decision-making and resource allocation? [Probe on formal and informal decision-making structures]

3. To what extent are data sources and systems for childhood immunization integrated across organizations, projects, initiatives (including government agencies)? Please explain your response.

4. Are there any power dynamics among these stakeholders that influence how data is collected, shared and used? Can you explain them?

5. How do political and economic factors shape the relationships between stakeholders and their influence over data collection, sharing and use for policies and programming related to ZD?

6. Do you have access to data collected by others, including government agencies or partner organizations, to identify, reach, monitor or advocate for ZD?

7. [Probe about each of these specific data sources: DHIS2 (national, state, or LGA level?); LQAS; SMS-based reporting; campaigns for polio, non-polio supplementary immunization activities, periodic intensification of routine immunization, measles, yellow fever, and fraction Inactivated Polio Vaccine).

   For each data source mentioned, follow up:
   i. If yes (i.e. respondent has access data collected by other organizations), please provide some details related to:
      1. What organization collects this data and how do you access it?
      2. How often do you access this data?
      3. How do you use this data?
   ii. If no (i.e. respondent does not have access to data collected by other organizations):
      1. Is there data collected by other organizations that you think could be helpful to you as you do your work?
         a. If yes: Please elaborate on what this data is and why you are not able to access it.
         b. If no: Does the data you/your organization collects meet all the needs for the work that you/your organization engages in? Are there any data gaps that could be filled by data collected by other organizations? Please elaborate.

Recommendations for Improvement:

1. What specific policy changes or interventions do you believe would help address the challenges mentioned above regarding the collection, sharing and use of ZD data and evidence as well as the coordination and collaboration across organizations to collect, capture and report on ZD?

2. What specific solutions, including digital solutions, do you believe would help address the challenges around the fragmentation of data systems and sources for childhood immunization? Please be as specific as possible.

3. Are there any successful strategies or best practices from other contexts that could be adopted in Nigeria as a whole and/or at the subnational level to improve data collection and use practices related to ZD children?

Conclusion:

1. Thank the respondent for their valuable insights and participation in the interview.

2. Offer the respondent an opportunity to add any additional comments or information they think is important.

3. Reiterate the importance of their contributions to the political economy analysis and express gratitude for their time.

4. Assure them that their responses will be used to inform a comprehensive understanding of the issue and potential solutions.

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