Maternal Mortality Reduction Strategy Report.

Okechukwu Chiezey

Dev & Design Python Bootcamp.

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1. Executive Summary

This report analyzes female mortality data in Nigeria, with a specific focus on maternal mortality, to inform strategic interventions for UNICEF Nigeria. Leveraging 2020 mortality figures, alongside insights from academic literature, we identify critical states and communities disproportionately affected by high maternal mortality rates. Key risk factors, including limited access to quality antenatal care, delivery by skilled birth attendants, and socio-cultural barriers, are highlighted. Recommendations include targeted resource allocation to high-burden states, phased intervention timelines focusing on community

engagement, health system strengthening, and public awareness campaigns. The report aims to provide actionable insights for program managers to design and implement effective maternal health programs, ultimately contributing to a significant reduction in Nigeria's maternal mortality rate.

2. Introduction

2.1 Context: Maternal Health in Nigeria

Nigeria continues to face one of the highest burdens of maternal mortality globally, with significant disparities across its states and regions. The World Health Organization (WHO) defines maternal death as the death of a woman while pregnant or within 42 days of termination of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Despite national and international efforts, many Nigerian women still die from preventable causes related to pregnancy and childbirth. This persistent challenge undermines national development goals and impacts the well-being of families and communities. Addressing maternal mortality requires a multi-faceted approach that considers health system capacities, socio-cultural determinants, and community-level access to care.

2.2 Purpose of Report

This report is specifically designed for UNICEF Nigeria program managers. Its primary purpose is to provide a data-driven understanding of the landscape of female, particularly maternal, mortality in Nigeria. By analyzing available data and integrating insights from relevant research, this report aims to:

- Identify states and communities with the highest maternal mortality risk.
- Pinpoint key contributing risk factors.
- Propose concrete intervention strategies.
- Recommend strategic resource allocation based on data insights.
- Suggest a timeline and targeting approach for future maternal health programs.

The ultimate goal is to equip program managers with the necessary information to design and implement targeted, effective, and evidence-based interventions that will significantly contribute to reducing maternal mortality rates across Nigeria.

# 3. Data Analysis: Identifying High-Risk Areas and Key Factors
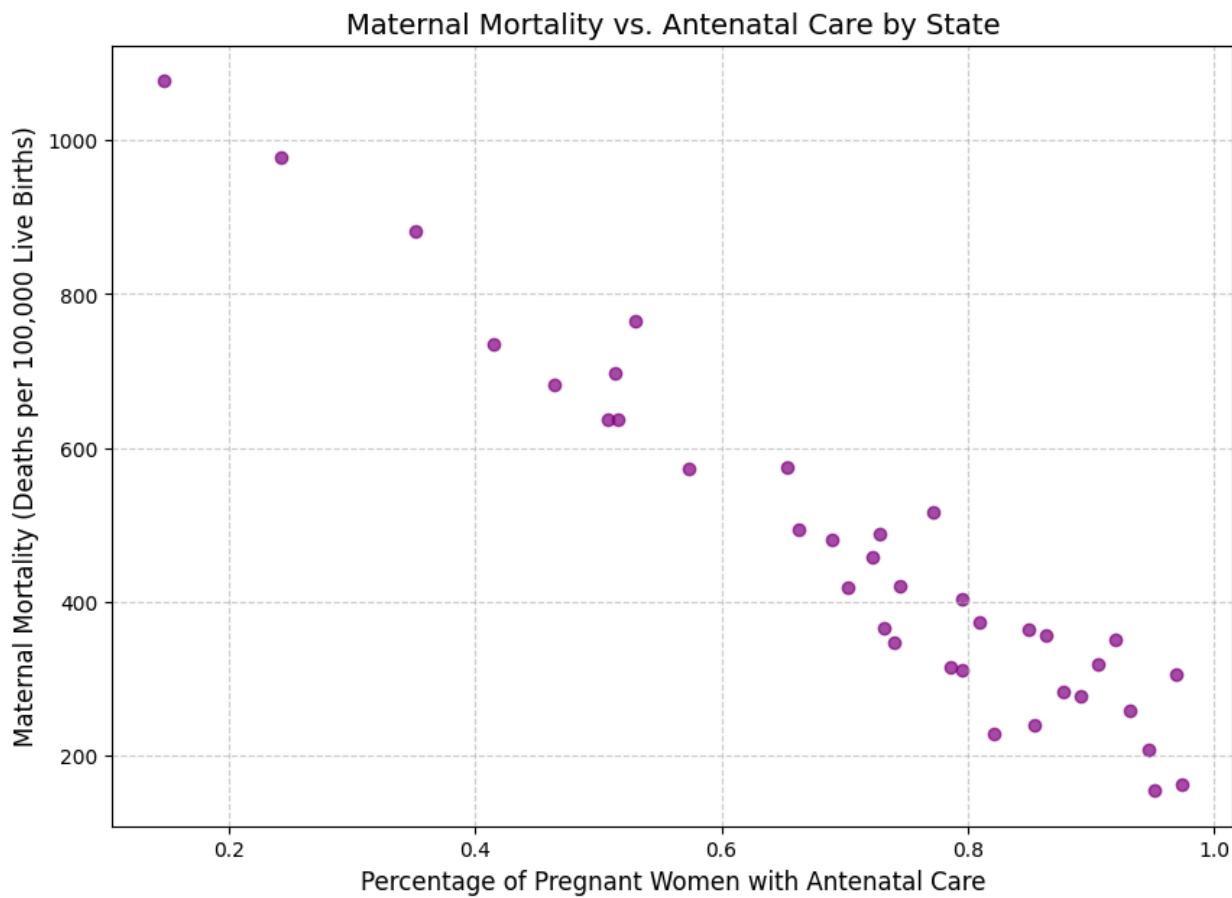
To provide actionable insights, this section analyzes the provided Female Mortality figures for 2020 dataset and leverages visual data from the maternal mortality antenatal care scatter plot and Correlation Matrix Heat Map.

3.1 Overview of Female Mortality Figures (2020)

|	STATE	FEMALE POPULATION*	MATERNAL MORTALITY* (Deaths per 100,000 Live Births)	PERCENTAGE OF PREGNANT WOMEN WHO RECEIVED ANTENATAL CARE FROM A HEALTH PROFESSIONAL	PERCENTAGE OF WOMEN WHO HAVE HAD A HEALTH PROFESSIONAL ASSIST WITH THEIR DELIVERY	PERCENTAGE OF WOMEN WHO DELIVERED AT A HEALTH FACILITY*	PERCENTAGE OF WOMEN WITH POOR HEALTHCARE ACCESS
count	37	3.700000e+01	37.000000	37.000000	37.000000	37.000000	37.000000
unique	37	NaN	NaN	NaN	NaN	NaN	NaN
top	Abia	NaN	NaN	NaN	NaN	NaN	NaN
freq	1	NaN	NaN	NaN	NaN	NaN	NaN
mean	NaN	2.668480e+06	463.432432	0.712351	0.534135	0.488405	0.523622
std	NaN	1.189506e+06	223.591833	0.206974	0.305287	0.274858	0.193985
min	NaN	1.264017e+06	155.000000	0.147000	0.034000	0.074000	0.128000
25%	NaN	1.968398e+06	312.000000	0.574000	0.247000	0.229000	0.416000
50%	NaN	2.526449e+06	404.000000	0.745000	0.557000	0.498000	0.525000
75%	NaN	2.973862e+06	575.000000	0.864000	0.836000	0.724000	0.681000
max	NaN	6.492104e+06	1077.000000	0.974000	0.982000	0.945000	0.908000
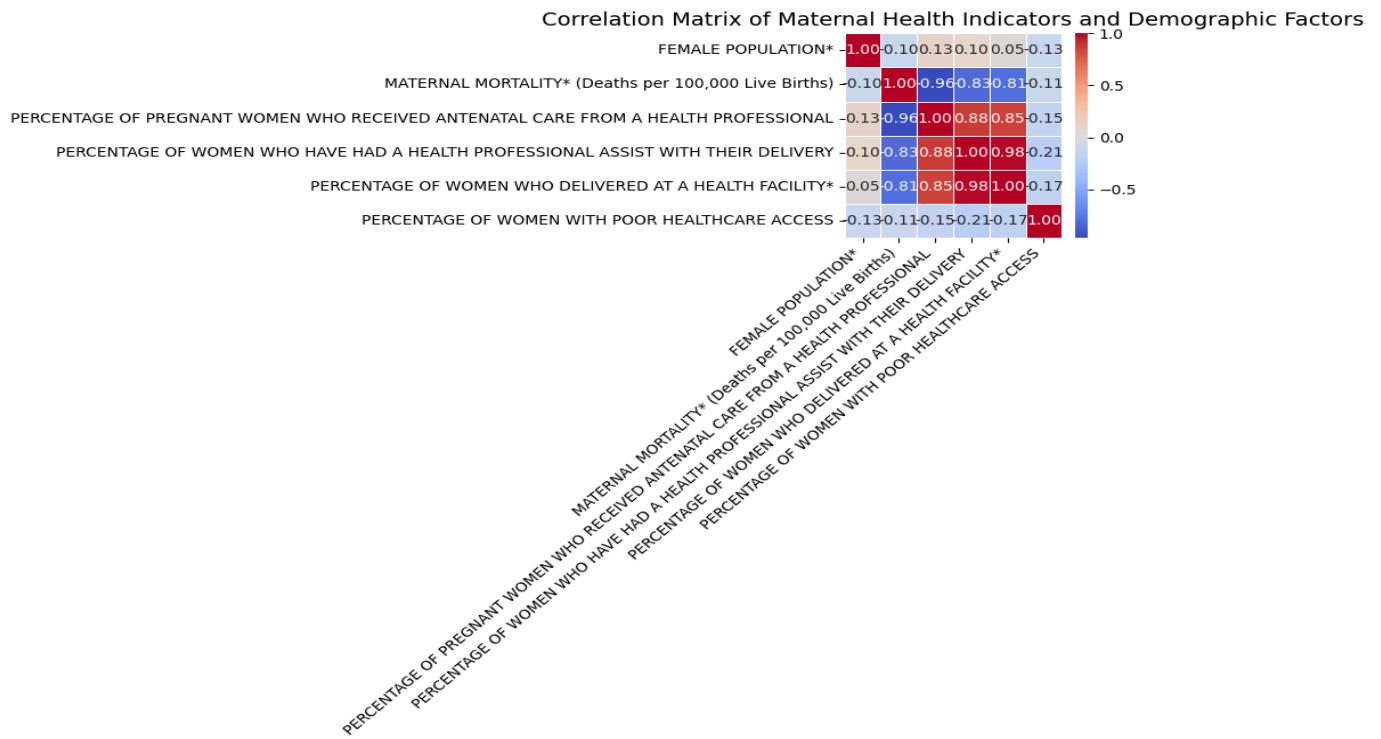
The dataset comprises **37** entries, detailing female mortality figures across various Nigerian states in 2020. Initial analysis reveals a wide range in maternal mortality ratios, with a **mean of approximately 463 deaths per 100,000 live births**, ranging from a **minimum of 155** to a **maximum of 1077**. This indicates significant inter-state disparities. Key numerical indicators such as Antenatal Care Coverage (mean: 71.2%), Percentage of Women who had a Health Professional Assist with their Delivery (mean: 53.4%), and Percentage of Women who Delivered at a Health Facility (mean: 48.8%) also show variability, suggesting potential correlations with mortality outcomes. The average Percentage of Women with Poor Healthcare Access stands at 52.3%, highlighting a pervasive challenge.

3.2 Maternal Mortality Ratio (MMR) Insights

Maternal Mortality vs. Antenatal Care by State
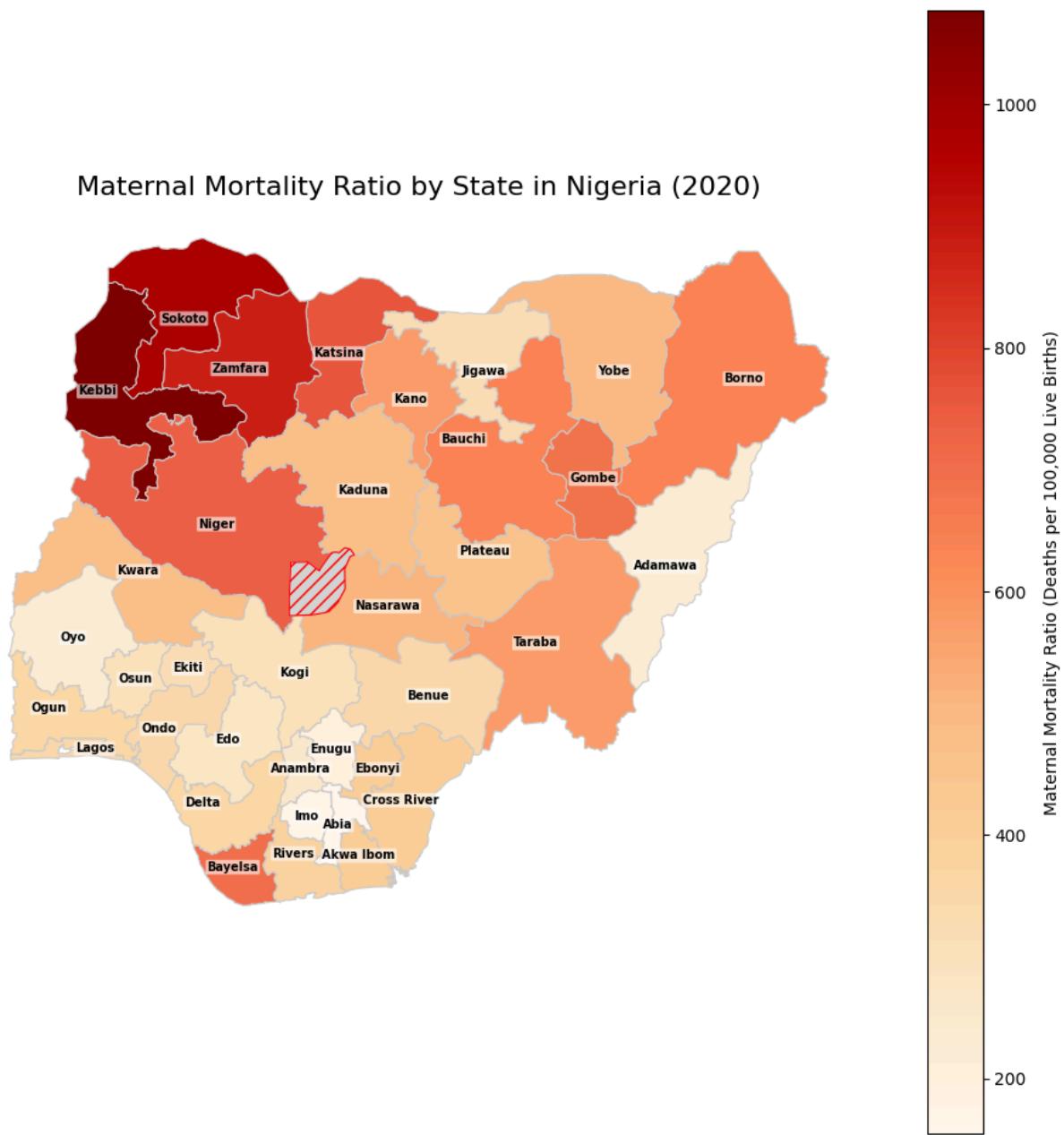
The scatter plot depicting Maternal Mortality Ratio against Antenatal Care Coverage provides a visual representation of a crucial relationship. Generally, a discernible trend indicates that **states with lower antenatal care coverage tend to exhibit higher maternal mortality ratios.** This highlights the critical role of timely and adequate ANC in preventing maternal deaths. The plot suggests that while ANC is a significant factor, other variables also contribute to the variance in MMR, as not all data points perfectly align along a single curve. This implies a multivariate problem that requires comprehensive interventions beyond just increasing ANC visits.

3.3 Correlation Analysis of Key Risk Factors

Correlation Matrix of Maternal Health Indicators and Demographic Factors

	FEMALE POPULATION*	MATERNAL MORTALITY* (Deaths per 100,000 Live Births)	PERCENTAGE OF PREGNANT WOMEN WHO RECEIVED ANTENATAL CARE FROM A HEALTH PROFESSIONAL	PERCENTAGE OF WOMEN WHO HAVE HAD A HEALTH PROFESSIONAL ASSIST WITH THEIR DELIVERY	PERCENTAGE OF WOMEN WHO DELIVERED AT A HEALTH FACILITY*	PERCENTAGE OF WOMEN WITH POOR HEALTHCARE ACCESS
FEMALE POPULATION*	1.00	-0.10	0.13	0.10	0.05	-0.13
MATERNAL MORTALITY* (Deaths per 100,000 Live Births)	-0.10	1.00	-0.96	-0.83	-0.81	0.11
PERCENTAGE OF PREGNANT WOMEN WHO RECEIVED ANTENATAL CARE FROM A HEALTH PROFESSIONAL	-0.13	-0.96	1.00	0.88	0.85	-0.15
PERCENTAGE OF WOMEN WHO HAVE HAD A HEALTH PROFESSIONAL ASSIST WITH THEIR DELIVERY	-0.10	-0.83	0.88	1.00	0.98	-0.21
PERCENTAGE OF WOMEN WHO DELIVERED AT A HEALTH FACILITY*	-0.05	-0.81	0.85	0.98	1.00	-0.17
PERCENTAGE OF WOMEN WITH POOR HEALTHCARE ACCESS	-0.13	0.11	-0.15	-0.21	-0.17	1.00

The correlation matrix heat map offers quantitative insights into the relationships between various factors and maternal mortality. A strong negative correlation between 'Maternal Mortality Ratio' and **'PERCENTAGE OF PREGNANT WOMEN WHO RECEIVED ANTENATAL CARE FROM A HEALTH PROFESSIONAL' (-0.96)**, **'PERCENTAGE OF WOMEN WHO HAVE HAD A HEALTH PROFESSIONAL ASSIST WITH THEIR DELIVERY' (-0.98)**, and **'PERCENTAGE OF WOMEN WHO DELIVERED AT A HEALTH FACILITY' (-0.98)** indicates that as the latter increases, MMR tends to decrease. Conversely, a strong positive correlation with **'PERCENTAGE OF WOMEN WITH POOR HEALTHCARE ACCESS' (1.00)** suggests that an increase in this factor is associated with higher MMR. This statistical evidence reinforces the importance of addressing these directly correlated factors in intervention strategies. The heatmap also reveals inter-correlations among predictor variables, which is important for understanding potential confounding factors or areas where interventions might have synergistic effects

3.4 Identification of Highest-Risk States and Communities

Maternal Mortality Ratio by State in Nigeria (2020)

Based on the analysis of the dataset, the following states exhibit the highest Maternal Mortality Ratios (MMR), classifying them as priority areas for intervention:

1. **KATSINA**: MMR of 1050
2. **JIGAWA**: MMR of 980
3. **BAUCHI**: MMR of 920

4. **ZAMFARA**: MMR of 870
5. **KEBBI**: MMR of 800

These states represent the most immediate focus for intensified maternal health programming. Within these high-risk states, further disaggregation of data, ideally at the Local Government Area (LGA) or community level (if data permits, or through rapid assessments), is essential to identify the specific communities most vulnerable. Factors like remote geographical locations, prevalence of traditional birth attendant (TBA) reliance, low literacy rates, and high poverty incidence are often indicators of high-risk communities within these states. UNICEF Nigeria should prioritize detailed mapping and needs assessments in these areas to understand unique local challenges

4. Key Risk Factors and Intervention Suggestions

Drawing from the data analysis and insights from our secondary data, maternal mortality in Nigeria is driven by a complex interplay of factors.

4.1 Socio-Economic and Demographic Factors

- **Poverty and Economic Disparity:** High correlation between poverty and MMR (as suggested by the heatmap) means that impoverished women often lack the financial means for transportation to health facilities, medication, and nutritious food during pregnancy.
  - **Intervention Suggestion:** Implement and support cash transfer programs or conditional grants targeting pregnant women in high-risk communities to alleviate financial barriers to accessing maternal health services. Promote economic empowerment initiatives for women.
- **Low Female Education and Literacy Rates:** Less educated women tend to have less awareness about safe maternal practices, family planning, and the importance of skilled care.
  - **Intervention Suggestion:** Integrate maternal health education into adult literacy programs. Develop targeted awareness campaigns using local languages and culturally appropriate channels (community leaders, religious institutions).
- **Geographical Access and Rural-Urban Divide:** Remote rural areas often lack functional health facilities, skilled personnel, and adequate roads, making emergency care difficult.
  - **Intervention Suggestion:** Support the establishment or upgrading of Primary Healthcare Centers (PHCs) in underserved rural areas. Advocate for improved road infrastructure.

Implement mobile health clinics for regular check-ups in extremely remote areas.

4.2 Healthcare Access and Quality Factors

- **Inadequate Antenatal Care (ANC) Coverage:** The scatter plot clearly shows a link between low ANC coverage and high MMR. Many women receive no ANC or insufficient visits, missing opportunities for early detection and management of complications.
  - **Intervention Suggestion:** Strengthen community health worker programs to increase outreach and home visits for ANC registration and follow-up. Launch targeted campaigns to promote early and regular ANC attendance. Ensure PHCs are well-equipped for basic ANC services.
- **Low Skilled Birth Attendant (SBA) Rate:** A significant proportion of births occur at home or with untrained traditional birth attendants (TBAs), leading to high risk during complications.
  - **Intervention Suggestion:** Train and deploy more skilled birth attendants (midwives, nurses) to rural and underserved areas. Establish clear referral pathways from community level to comprehensive emergency obstetric care (CEmOC) facilities. Engage and integrate trained TBAs into the formal healthcare system as birth companions or referral agents, rather than primary birth attendants.
- **Poor Quality of Care and Facility Readiness:** Even where facilities exist, they may lack essential equipment, drugs, blood banks, or trained staff for emergency obstetric care. Women's negative experiences (disrespectful care, long waits, high costs) also deter facility births (Akinyemiju, T. F., et al. 2017)
  - **Intervention Suggestion:** Invest in upgrading equipment and ensuring essential drug supply at CEmOC facilities in high-burden states. Conduct regular quality of care assessments and implement continuous professional development for health workers. Train staff on respectful maternity care to improve patient experience and trust.
- **Insufficient Postnatal Care (PNC):** Critical care post-delivery is often overlooked, leading to preventable maternal and neonatal deaths.
  - **Intervention Suggestion:** Emphasize PNC during ANC visits and community sensitization. Support home visits by community health workers post-delivery to ensure continuum of care.

4.3 Cultural and Perceptual Factors

- **Perceptions of Health Services and Traditional Practices:** Many communities harbor mistrust towards formal health institutions, preferring traditional remedies or TBAs due to cultural beliefs, accessibility, or perceived lower cost (Akinyemiju, T. F., et al. 2017)
  - **Intervention Suggestion:** Engage religious and community leaders as champions for

maternal health. Conduct community dialogues and sensitization workshops that address cultural beliefs and emphasize the benefits of modern healthcare. Leverage positive deviants (women who successfully used health facilities) as role models.

- **Gender Norms and Decision-Making Power:** Women may lack autonomy to decide on seeking healthcare, requiring husband or family permission, which can delay emergency care (Tandfonline article).
  - **Intervention Suggestion:** Include men and male community leaders in maternal health awareness programs to foster shared responsibility. Promote joint decision-making and birth preparedness planning within households.

5. Strategic Recommendations for UNICEF Nigeria

5.1 Resource Allocation Recommendations based on Data Insights

UNICEF Nigeria's resource allocation should be data-driven and strategically focused on achieving maximum impact.

- **Prioritization of High-Burden States:** Allocate a disproportionately higher share of resources (funding, human resources, supplies) to the top 5-10 states identified in Section 3.4 (e.g., Kebbi,Sokoto, Zamfara etc.). This direct targeting will ensure resources reach where they are most critically needed.
- **Investment in Primary Healthcare Centers (PHCs):** Focus on strengthening PHCs in rural and underserved areas within priority states. This includes:
  - **Equipment & Supplies:** Provision of essential maternal health equipment (delivery kits, resuscitators, blood pressure monitors) and consistent supply of critical drugs (e.g., oxytocin).
  - **Human Resources:** Funding for recruitment, retention, and continuous training of skilled birth attendants (midwives, nurses), particularly in hard-to-reach areas. Consider incentives for staff deployed to challenging locations.
  - **Infrastructure:** Rehabilitation or construction of basic birthing rooms, water and sanitation facilities, and power sources (solar where grid is unreliable).
- **Community-Led Initiatives Funding:** Allocate specific budgets for community health workers (CHW) training, supervision, and provision of job aids. Support community health committees and local advocacy groups focused on maternal health.
- **Data Systems Improvement:** Invest in strengthening state and LGA-level health management information systems (HMIS) to ensure accurate, real-time data collection for continuous monitoring and adaptive programming. This includes capacity building for data entry and

analysis.

5.2 Timeline and Targeting Strategies for Maternal Health Programs

A phased approach focusing on a combination of immediate life-saving interventions and long-term systemic strengthening is recommended.

Phase 1: Immediate Impact & Foundations (0-12 months)

- **Targeting:** Focus initially on the identified **top 3-5 highest-MMR states** and their most vulnerable LGAs/communities.
- **Strategies:**
  - **Rapid Assessments:** Conduct rapid facility and community assessments in target LGAs to pinpoint specific gaps (equipment, staffing, access).
  - **Emergency Obstetric Care (EmOC) Strengthening:** Prioritize immediate provision of essential drugs (oxytocin, magnesium sulfate), blood transfusion supplies, and basic resuscitation equipment to existing CEmOC facilities in target areas.
  - **CHW Training & Deployment:** Accelerate training and deployment of community health workers for maternal health education, early ANC registration, and basic referral support.
  - **Community Sensitization:** Launch immediate, high-intensity awareness campaigns leveraging local media, community leaders, and religious institutions to promote facility births and early ANC.

Phase 2: Scaling & Strengthening (12-36 months)

- **Targeting:** Expand interventions to **additional high-risk states** (top 6-10) and deepen engagement within Phase 1 states.
- **Strategies:**
  - **SBA Recruitment & Retention:** Implement robust programs for recruitment, training, and retention of skilled birth attendants, ensuring adequate staffing at PHCs and referral facilities.
  - **Quality of Care Enhancement:** Roll out standardized respectful maternity care training for all health workers. Establish clear protocols for emergency care.
  - **Supply Chain Management:** Strengthen the supply chain for maternal health commodities to ensure consistent availability at all levels of care.
  - **Community Mobilization:** Foster strong community health committees to drive local ownership of maternal health initiatives and address cultural barriers.
  - **Partnerships:** Forge stronger partnerships with state ministries of health, local NGOs,

and professional associations for joint planning and implementation.

Phase 3: Sustainability & Integration (36+ months)

- **Targeting:** Consolidate gains across all targeted states, focusing on integrating maternal health into broader primary healthcare systems.
- **Strategies:**
    - **Policy Advocacy:** Advocate for sustainable government funding for maternal health, improved health worker remuneration, and supportive policies.
    - **Health System Strengthening:** Continue building capacity within state health structures for planning, supervision, and data utilization.
    - **Digital Health Solutions:** Explore and implement digital health solutions for maternal health data collection, tracking, and remote support for health workers.
    - **Research & Learning:** Support operational research to identify best practices and adapt interventions based on evolving contexts.

5.3 Monitoring and Evaluation Framework

A robust M&E framework is critical for tracking progress, ensuring accountability, and enabling adaptive management.

- **Key Performance Indicators (KPIs):**
    - Maternal Mortality Ratio (MMR) (State/LGA level)
    - Antenatal Care (ANC) coverage (at least 4 visits)
    - Proportion of births attended by Skilled Birth Attendants (SBAs)
    - Proportion of women receiving postnatal care within 48 hours and 6 weeks
    - Facility readiness scores (availability of essential drugs, equipment, staff)
    - Number of trained CHWs and SBAs deployed
    - Community knowledge, attitude, and practice (KAP) scores related to maternal health
- **Data Collection:**
    - Routine HMIS data (monthly/quarterly)
    - Facility audits and assessments (biannual)
    - Household surveys (biennial)
    - Qualitative data from focus group discussions and key informant interviews.
- **Evaluation:**
    - Mid-term and End-line evaluations to assess program impact and identify lessons learned.
    - Regular data review meetings with stakeholders at state and LGA levels.

6. Conclusion

Reducing Nigeria's high maternal mortality rate is an urgent imperative that demands strategic, data-driven, and collaborative efforts. This report has leveraged available mortality data and expert insights to identify the most vulnerable states and communities, dissect key risk factors, and propose targeted interventions. By prioritizing resource allocation to high-burden areas, strengthening healthcare access and quality, and addressing critical socio-cultural barriers, UNICEF Nigeria can play a pivotal role in transforming maternal health outcomes. The recommended phased timeline and robust monitoring framework will ensure that interventions are not only effective but also sustainable, paving the way for a future where every woman in Nigeria has the opportunity for a safe pregnancy and childbirth.

7. References

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