

**Project Title:**

Primary Health Care (PHC) Performance Dashboard

**Goal:**

To analyze and visualize PHC performance data to uncover coverage gaps, disease burden, and workforce disparities, providing actionable insights for decision-making.

**Problem Statement:**

Nigeria's Primary Health Care (PHC) system faces critical systemic challenges that prevent millions of citizens from accessing quality healthcare. Despite having over 32,000 PHC facilities across the country, only 20.3 % are fully functional, leaving significant gaps in service delivery.

**Dataset:**

Find details in the *datasetgeneration*

*Data source: Amazon Redshift*

**Data Cleaning and Transformation:**

Find details in the

**Executive overview page – Key Findings**

Nigeria has an estimated 32,000 Primary Health Care (PHC) facilities nationwide. However, only 20.32% (6,501) are fully functional, while the remaining 70.68% are partly functional or non-functional, underscoring the urgent need for infrastructure strengthening. Across all facilities, there are approximately 121,456 health workers, averaging just four workers per facility, with staffing levels ranging from zero to sixteen. This falls far below the WHO-recommended minimum of about 50 health workers per facility required for adequate service delivery.

During the review period, a total of 3,001,604 patients were served across all PHCs. However, healthcare delivery remains uneven the Service Equity Index stands at 58.25%, revealing significant disparities in access. This means some facilities handle a disproportionately high patient load, while others remain underutilized. The Facility Utilization Index of 6.43 out of 10 further highlights this imbalance, suggesting that many PHCs are operating below their optimal capacity due to workforce shortages, infrastructure gaps, or unequal service distribution.

The top five diseases reported across Nigeria's PHC facilities reveal a high burden of communicable illnesses. Malaria remains the leading cause with 170.44M cases, followed by Respiratory Infections (90.53M) and Diarrhea (28.38M). Maternal health issues (20.03M) continue to pose major challenges, while Hypertension (12.70M) highlights the rise of non-communicable diseases across the country.

**Patients Analysis – Key Findings**

A total of 3,001,604 patients were treated across all PHC facilities, with an average age of 28 years and a nearly equal gender distribution. Pediatric cases (1.18M) make up a substantial portion, nearly 4 in 10 patients are children while most patients fall within the 20–39 age range. The treatment success rate (98.6%) reflects strong clinical outcomes, and the referral rate (1.08%) shows most cases are managed at the PHC level.

Monthly trends reveal consistent patient volumes throughout the year, averaging around 250,000 visits per month, with slight dips observed in February and April. This suggests a stable healthcare demand pattern with no extreme seasonal fluctuations.

The top five diseases: Malaria, Respiratory Infections, Diarrhea, Maternal Health Issues, *and* Hypertension, continue to dominate patient cases, underscoring the high communicable disease burden and the growing threat of non-communicable conditions in Nigeria's PHC system.

### **Facility Analysis Page – Key Findings**

The Facility Performance Overview table provides a state-by-state breakdown, enabling deeper insights into functionality, staffing, patient volume, and bed capacity across regions.

The Facility Type Distribution chart shows that Primary Health Centers dominate Nigeria's PHC landscape, accounting for about 60% of facilities, followed by Health Posts (30%) and Dispensaries (10%). This structure reflects Nigeria's three-tier PHC system, but the heavy reliance on lower-level facilities may limit access to comprehensive care, particularly in rural and underserved regions.

The Distribution of PHCs by Patients highlights inequities in patient load, where a significant number of facilities serve fewer than 200 patients annually, while a few carry a disproportionately high burden. This imbalance indicates possible inefficiencies in service delivery, patient preference for specific facilities, or geographical barriers affecting access.

The Health Workforce by Role chart shows a heavy reliance on lower-care workers, with Community Health Extension Workers (CHEWs) forming the largest group (34,015), followed by support staff (22,691) and junior community health workers (21,221). Skilled professionals such as doctors, nurses, and laboratory technicians make up a much smaller share, highlighting a shortage of specialized personnel that may affect care quality and service efficiency.

### **Disease Analysis Page – Key Findings**

A total of 308,569,123 cases and 1,237,068 deaths were reported across all PHC facilities, resulting in an overall Case Fatality Rate (CFR) of 0.40%. The Disease Burden Index of 52.00 indicates a moderately high burden across the healthcare system, though the relatively low fatality rate reflects effective management and ongoing public health interventions. On average, each facility recorded approximately 47,465 reported cases, signifying a high service demand on the existing health infrastructure.

Malaria remains the dominant disease with about 170 million cases, accounting for over half of total reports. Other major conditions include Respiratory Infections (51M), Diarrhea (28M), Maternal Health Issues (20M), and Hypertension (13M). This highlights malaria as the most persistent public health challenge.

In terms of fatality, Maternal Health records the highest CFR (1.0%), followed by Malaria, Diarrhea, and Other Diseases (~0.5%), while STIs have the lowest (0.1%). Despite lower case numbers, maternal health issues are more fatal per case, emphasizing the need for stronger emergency and maternal care services.

Monthly trends indicate that Malaria remains consistently high throughout the year, peaking during rainy months, while Respiratory Infections and Diarrhea fluctuate mildly. A decline in cases from August onward likely reflects seasonal variations or reduced reporting activity.

## Recommendations

The analysis highlights a strong primary healthcare (PHC) system in terms of coverage and disease reporting, but with clear gaps in equity, workforce balance, and disease control. Based on the findings:

- 1. Address Healthcare Inequity:**  
The Service Equity Index of 58.25% shows uneven access to care. Targeted investments should focus on underserved LGAs and rural areas to ensure more balanced patient distribution and equitable service delivery.
- 2. Reinforce Malaria Control Efforts:**  
With malaria accounting for over half of total reported cases and showing the highest mortality rate, there is an urgent need to scale up preventive interventions, ensure consistent drug supply, and strengthen early detection programs.
- 3. Enhance Maternal Health Capacity:**  
The high fatality rate in maternal cases signals gaps in emergency response and skilled birth attendance. Strengthening maternal health infrastructure, referral systems, and antenatal outreach can reduce avoidable deaths.
- 4. Rebalance Health Workforce Composition:**  
The dominance of Community Health Extension Workers (CHEWs) highlights a shortage of skilled professionals. Recruitment and training of nurses, doctors, and laboratory staff are essential for improved diagnostic accuracy and quality care.
- 5. Strengthen Data Quality and Timeliness:**  
Fluctuations in monthly reporting suggest possible data capture or seasonal inconsistencies. Enhancing digital reporting systems and data validation processes will improve monitoring and resource allocation.
- 6. Leverage Data for Decision-Making:**  
Continuous monitoring of PHC performance through dashboards and data-driven insights should guide policy decisions, funding priorities, and health program evaluations.
- 7. Community Health Education and Prevention:**  
Sustained awareness campaigns on hygiene, nutrition, and disease prevention can reduce the burden of diarrhea, respiratory infections, and hypertension.
- 8. Launch Rapid Facility Activation Program:** Prioritize the 70% partially functional and non-functional facilities for quick restoration. Focus on Bottom 10 underserved LGAs first. Deploy rapid assessment teams to identify low-cost fixes (minor repairs, drug restocking, 1-2 staff additions).

Link to interactive report:

<https://app.powerbi.com/view?r=eyJrIjoiNzQ4Yjg2ZDEtMTMyOS00NzdkLTg4ZTUtNGNkY>

WIwMzhjNzQ4IiwidCI6ImQwMjZkZjkxLTg4MTYtNDIyNS04YmlyLWMzODJhOGUxZWYwYyJ9