

ORIGINAL ARTICLE

Zubairu I. et al... Breast Cancer in Nigeria, Current Evidence and Pathways to Scale Early Detection

BREAST CANCER IN NIGERIA, CURRENT EVIDENCE AND PATHWAYS TO SCALE EARLY DETECTION

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Citation: Zubairu IH, Liman AB, Umar SS, Sani M, Popoola BO. Breast Cancer In Nigeria, Current Evidence and Pathways to Scale Early Detection. *Niger J Oncol* 2026;2(2):57- 67

ABSTRACT

Breast cancer is the most commonly diagnosed cancer among Nigerian women and a leading cause of cancer death. The national burden continues to grow amid late presentation, limited organized screening, and fragmented pathways to diagnosis and treatment. Drawing on global guidance and Nigerian evidence, this narrative review synthesizes the epidemiology of breast cancer in Nigeria, appraises screening modalities (clinical breast examination, mammography, and adjunct tools), examines barriers to uptake, and outlines practical, resource-aligned strategies for early detection. Recent national policy steps—including the National Strategic Cancer Control Plan (NSCCP) 2023–2027 and the growing role of National Institute for Cancer Research and Treatment (NICRAT)—offer an enabling frame, but implementation hinges on financing, workforce development, primary-care integration, and data systems. A convergent model—anchoring breast health awareness, risk assessment, CBE in primary care, diagnostic mammography/ultrasound hubs, and patient navigation in secondary (including specialist hospitals) and tertiary health facilities—is most feasible in the near term. We propose measurable targets aligned with the WHO Global Breast Cancer Initiative to shift diagnosis to earlier stages and reduce mortality.

INTRODUCTION

Globally, WHO estimates 2.3 million new breast cancers and 670,000 deaths in 2022; the highest mortality-to-incidence ratios are concentrated in low- and middle-income (LMIC) settings, reflecting late stage at diagnosis and constrained access to comprehensive treatment.¹ For example,

according to GLOBOCAN 2022, Nigeria, an LMIC, had a mortality incidence ratio of 50.6%, compared to 15.6% for the United States, which is a high-income country (HIC).²

Breast cancer remains the most frequent cancer among women in Nigeria and the leading cause of female cancer deaths.³ Nigeria recorded 32,278 new breast cancer cases and 16,332 deaths in 2022, with five-year prevalence

exceeding 74,000 survivors—a clear indicator of ongoing clinical and survivorship needs.²

Projections suggest that without significant structural change, Africa’s burden will grow

faster than other regions, with persistent survival gaps by 2050. These disparities underscore the urgency of early detection linked to timely diagnosis and treatment, not screening in isolation.⁴

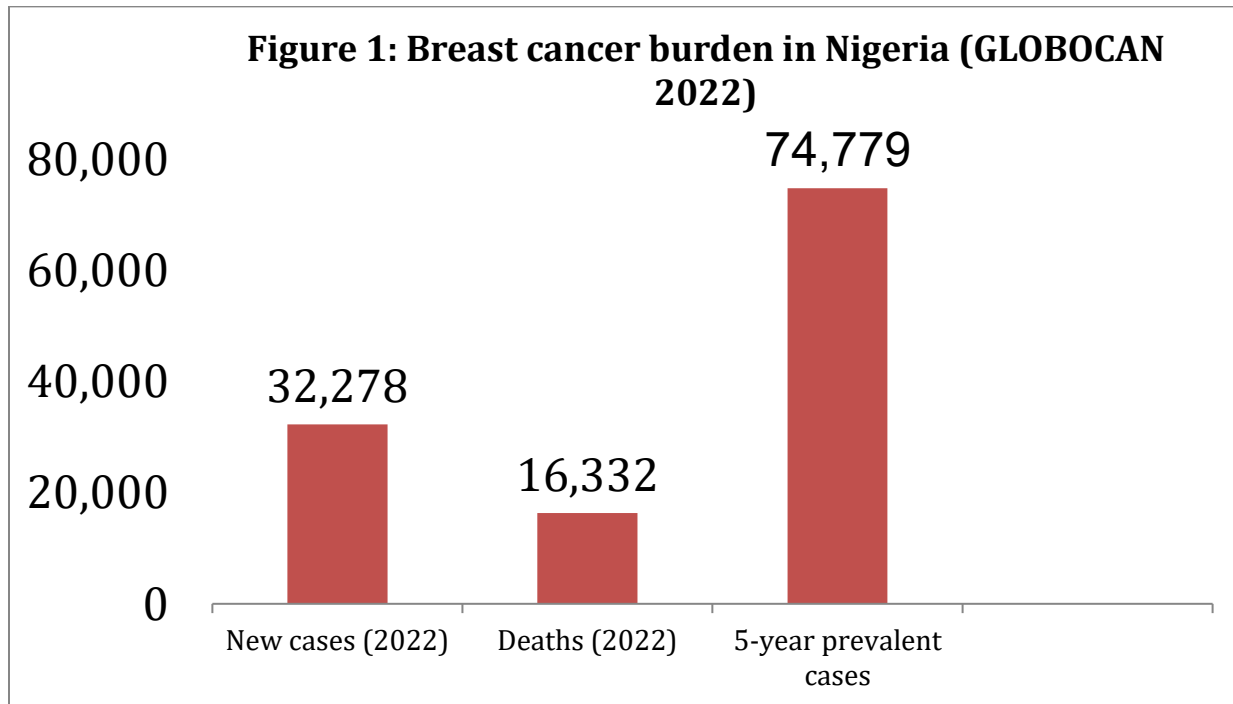


Figure 1: Breast Cancer Burden in Nigeria (GLOBOCAN 2022)

MATERIALS AND METHODS

Study design

This work is a narrative review synthesizing epidemiological data, screening evidence, implementation studies and health system policies relevant to breast cancer early detection in Nigeria. A narrative review was selected due to the heterogeneous nature of available evidence and because the aim was to:

1. Integrate heterogeneous sources of epidemiological, clinical, implementation, and policy evidence, **2.** Situate global guidelines for the Nigerian health system, and **3.** Propose

practical, resource-aligned pathways for scale-up. The review was guided by three overarching questions:

What is the current burden and epidemiology of breast cancer in Nigeria?

What screening and early detection modalities exist, and what is their evidence base in Nigeria?

What structural, financial, governance, and workforce factors influence the feasibility of early detection scale-up?

Search strategy

A targeted search of peer-reviewed literature and policy documents was conducted for materials published between 2014 and 2025. Searches were performed using:

PubMed, Google Scholar, and African Journals Online (AJOL) for academic publications.

WHO technical documents, including the WHO Global Breast Cancer Initiative and GLOBOCAN 2022.

Nigerian national policy documents, including the National Strategic Cancer Control Plan (NSCCP 2023-2027), National Cancer Control Programme publications, and the National Cancer Research Agenda (NICRAT).

Implementation studies and protocols, such as mobile screening models and clinical Breast Examination (CBE) implementation research in Abuja and Osun.

Search terms used were: “breast cancer screening”, “clinical breast examination Nigeria”, “mammography uptake Nigeria”, “breast cancer early detection LMIC”, “breast health awareness Nigeria”, “diagnostic pathways Nigeria” and “resource-stratified screening”.

(Breast cancer screening OR early detection) AND (clinical breast examination Nigeria) AND (mammography uptake Nigeria) AND (breast health awareness) AND (diagnostic pathways Nigeria) AND (resource-stratified OR LMIC screening)

Table 1: Inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none">● Studies involving Nigerian populations or the Nigerian health system.● Research on BSE, CBE, mammography, ultrasound, or adjunct diagnostic tools.● National or international guidelines relevant to LMIC early detection.● Implementation studies, cost-effectiveness analyses, and workforce-capacity studies	<ul style="list-style-type: none">● Literature focused exclusively on treatment outcomes without relevance to early detection.● Case reports with no wider applicability● Studies from high-income countries unless used for contextual comparison.

RESULTS

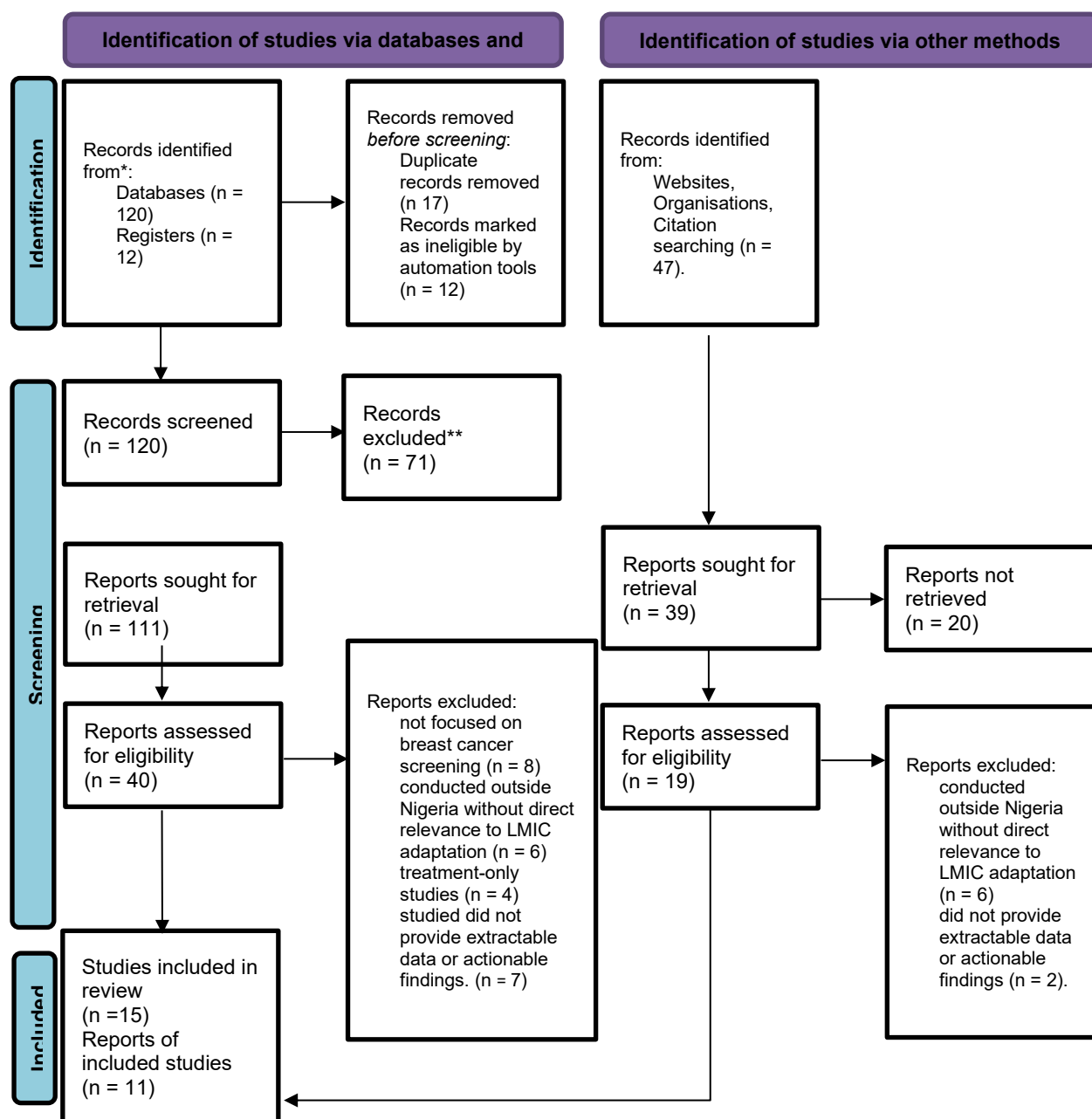


Figure 2: PRISMA 2020 flow diagram for systematic review

Data were extracted manually, and they covered: burden of disease – incidence, mortality, stage distribution; screening modalities – uptake, feasibility, comparative evidence, barriers; health-system determinants – financing, governance, diagnostic capacity, referral systems; implementation readiness – workforce training, diagnostic turnaround times, navigation models; policy frameworks – WHO GBCI pillars, BHGI resource-stratified guidelines, national cancer control efforts.

A thematic synthesis was conducted to integrate diverse evidence streams into the following domains: screening behavior, service availability, system constraints, policy environment, and scalable early-detection pathways.

While formal systematic review tools were not applied, the quality of information extracted was ensured through prioritization of studies published within the last ten years, alignment with globally recognized frameworks (GBCI KPIs, BHGI resource-stratified guidance), and cross-checking data for internal consistency across sources.

All data used were from publicly available sources; no human subjects were involved; therefore, Ethical approval was not required.

DISCUSSION

National policy context and governance

Nigeria has taken important steps in the last decade to systematize cancer control. The National Strategic Cancer Control Plan 2023–2027 (NSCCP) sets priorities across prevention, early detection, diagnosis, treatment, palliative care, data, and

governance.⁵ The establishment and operationalization of the National Institute for Cancer Research and Treatment (NICRAT) are central to implementing the plan and the National Cancer Research Agenda 2024–2028.⁶ These policy frameworks were spotlighted in 2023–2025 stakeholder communiqués and roundtables as the anchor for multi-sector partnerships and financing innovations.⁷

While Nigeria's earlier National Cancer Control Plan 2018–2022 provided a strategic baseline, the new plan is broader in scope and more explicit about early detection, access pathways, and data strengthening—key factors influencing breast cancer outcomes.⁸ The Federal Ministry of Health's National Cancer Control Programme also pursued access to cancer medicine at subsidized rates in a timely manner, and facilitated upgrades for six center of excellence in each geopolitical zone. These investments must be supported by boosting early detection capacity to shift the stage at diagnosis.⁹

Early detection without timely diagnosis and treatment will not reduce mortality. The Global Breast Cancer Initiative (GBCI) emphasizes concluding imaging and biopsy within 60 days of initial screening and completing treatment.¹⁰ Translating this to Nigeria implies:

- Developing capacity of PHCs for community awareness campaigns, health education and basic screening using CBE. Clear referral and back-referral pathways from Primary Health Care Centers (PHCs) to imaging centers and pathology in secondary and tertiary hospitals.
- Patient navigation at all three levels to reduce loss to follow-up.

- Improving diagnostic capacity (Ultrasonography, mammography, biopsies, and pathology turnaround time) at the secondary and tertiary health facilities
- Financial risk protection to avoid catastrophic out-of-pocket spending.

Nigeria's emerging mobile detection plus navigation pilots explicitly target these intervals; early insights from Osun and upcoming Abuja implementation work will be crucial to inform national scale-up designs.⁴

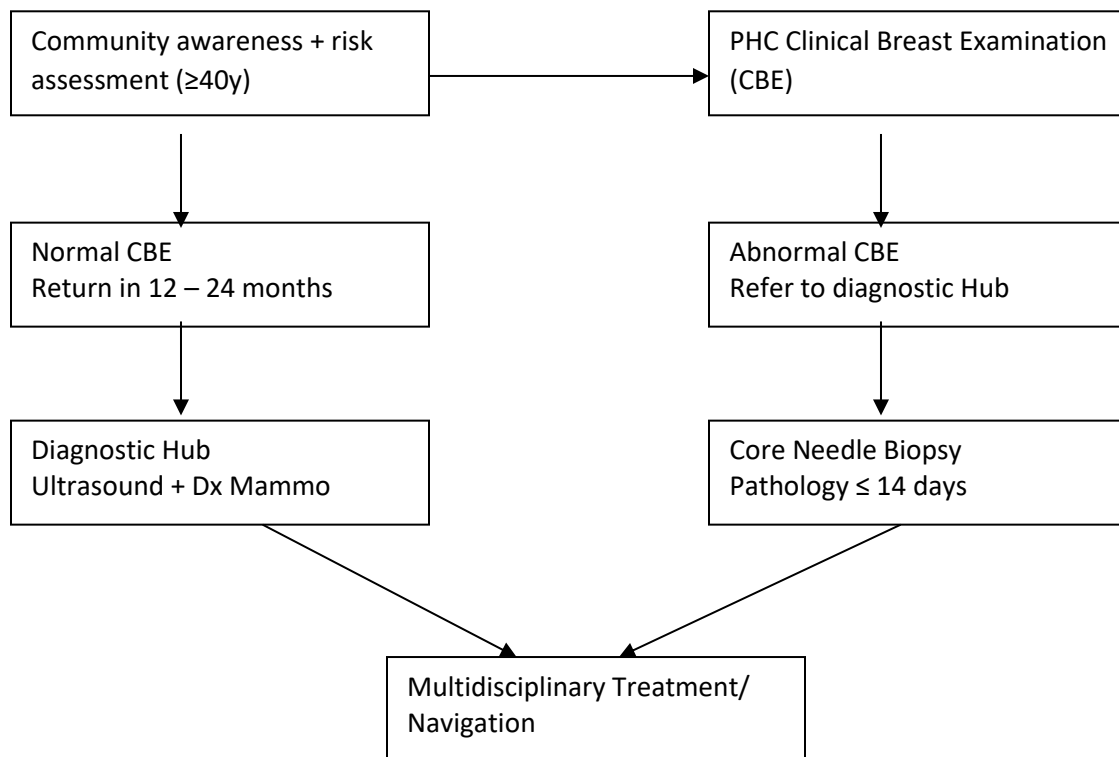


Figure 3: Resource-stratified early detection and diagnostic pathway

Screening in resource-limited settings

Global guidance, local adaptation

In high-income countries, organized mammography screening has reduced mortality. But global expert groups emphasize resource-stratified approaches: LMICs should not automatically replicate HIC screening ages and intervals.¹¹ Rather, programs should prioritize awareness, breast examination skills,

rapid diagnostic pathways, and treatment capacity, tailoring mammography's role to feasibility and equity.¹¹

The WHO Global Breast Cancer Initiative (GBCI) frames three pillars with measurable targets:¹⁰

Health promotion/early detection, targeting $\geq 60\%$ stage I–II diagnoses;

Timely diagnostics, completing imaging and biopsy within 60 days; and

Comprehensive treatment, achieving $\geq 80\%$ completion without abandonment. These targets are programmatic, not technology-specific, recognizing diversity of pathways across settings.

Evolving international recommendations

Major guideline bodies such as the United States Preventive Services Task Force (USPSTF) 2024, and American College of Radiology/ National Cancer Comprehensive Network (ACR/NCCN) 2023 updated recommendations emphasizing earlier risk assessment by age 25 and starting mammography at 40 for average risk in HIC contexts; however, they also highlight evidence gaps for supplemental imaging in dense breasts. Such guidance is informative but not directly transferable to national programs in Nigeria without resource and access alignment.^{12,13} The Breast Health Global Initiative (BHGI), in trying to address these gaps, made resource and culturally tailored guidelines that can be used in a step-wise manner in low- and middle-income countries (LMICs). These guidelines were constituted into four resource levels, which include basic, limited, enhanced and maximal levels of resources. For basic resource level, strategies include breast health awareness through health education and promotion, self-breast examination, and clinical breast examination (CBE). For limited resource levels, it includes CBE and diagnostic ultrasound scan with or without mammography, while the enhanced and

maximal levels involve diagnostic mammography with opportunistic breast screening, and population-based mammography screening, respectively.¹⁴

Breast health awareness and breast self-examination (BSE)

Systematic reviews of Nigerian studies consistently show high awareness of breast cancer but low sustained screening practices.¹⁵ BSE is the most commonly practiced behavior in communities and among health workers, but skills and periodicity vary widely; fear and misconceptions remain barriers.¹⁶ While BSE is not sufficient alone as a screening test, structured breast awareness interventions can prompt earlier help-seeking and act as a gateway to Clinical breast examination (CBE) and diagnostics.

Clinical breast examination (CBE)

CBE is feasible, low-cost, and can be scaled via primary care and community nurses if training, supervision, and referral linkages are standardized. Cross-sectional data from studies in Nigeria show high willingness among women ≥ 40 years to receive periodic CBE.¹⁵ However, lack of perceived need and low awareness are dominant reasons for non-uptake.¹⁷ Workforce studies in Lagos suggest high knowledge but uneven competency, reaffirming the need for standardized skills training, quality assurance, and supervision.¹⁸

Momentum is building to operationalize CBE in primary health care. A Yale–Institute of Human Virology of Nigeria (IHVN) study (2025–2026) is co-designing CBE implementation strategies for Abuja PHCs, addressing workflow, referral, and community

engagement—exactly the operational layer early detection programs need.¹⁹

Mammography

In Nigeria today, mammography functions mainly as opportunistic screening and diagnostic imaging in urban centers. A one-year tertiary hospital analysis in Osun State recorded 324 mammograms, with 57% screening and 43% diagnostic; community engagement and self-referral dominated patient pathways, and 20% paid out-of-pocket. While cancers were identified, the screen-detected early tumor proportion was low—a reflection of limited coverage and a high symptomatic load.²⁰

At a system level, a 2024 cost–benefit analysis found that out-of-pocket–funded mammography is not cost-beneficial to providers (benefit–cost ratio ≈ 0.45), reinforcing the need for public financing or pooled payment if mammography is to scale equitably.²¹

Narrative and critical appraisals across Nigeria demonstrate that infrastructure concentration, equipment maintenance, workforce (radiographers/radiologists), and financing are major challenges that result in geographic inequity and low uptake.²²

Ultrasound and adjunct technologies

In practice, diagnostic ultrasound is widely used alongside mammography for symptomatic evaluation and for dense breasts. Implementation studies in South-West Nigeria are testing mobile, “triple-mobile” early detection models that combine CBE, iBreastExam (iBE), mobile ultrasound, and mobile mammography, coupled with patient

navigation for biopsies and treatment initiation.⁴

Screening awareness and uptake in Nigeria

Multi-site and local studies uniformly show low to modest uptake of mammography and CBE, despite awareness campaigns. In Kaduna, 2024, among 265 women, 55% practiced BSE, but mammography adoption mostly sat at preparation stage (34%) using the Transtheoretical Model, suggesting that behavioral nudges and service convenience may convert intention to action.²³ Whereas a study in Calabar (2022) conducted among women ≥ 40 , mammography uptake was poor; socio-demographic determinants (education, income, marital status) predicted use—implicating equity-focused design and fee protection.²⁴ Among nurses in Lagos University Teaching Hospital (LUTH), 2025, awareness was universal, BSE was commonly practiced, but CBE (58%) and mammography (7%) use among them was low—highlighting the gap between knowledge and practice even among health workers.²⁵

Barriers documented in Nigeria include embarrassment, low perceived risk, spousal permission, provider gender preference, and stigma—patterns unchanged from earlier narrative reviews and still salient for program design.²⁶

What should Nigeria prioritize now?

Nigeria should prioritize a strategy that combines resource stratification, financing and purchase, workforce development, and time-to-diagnosis metrics. Community-level early detection with hub-based diagnostics can be

achieved by population awareness and risk assessment. Standardized community messaging to bust myths and emphasize benefits with education about practical steps to expect at the clinic. Brief risk assessment at PHC (or out-patient department), including age, family history, prior breast disease, chest irradiation, etc., can be adapted from tools used in HIC and deployed.

CBE as the initial screening test for women aged ≥ 40 and (< 40 if symptomatic or high risk) with standardized techniques using the IARC atlas for competency assessment, and task-sharing to nurses and community health workers (CHWs), plus male/female examiner options to respect preferences. Rapid referral of symptomatic or high-risk women to diagnostic hubs for imaging and biopsy. While developing the capacities of PHCs to conduct CBEs, geographic accessibility should be considered, especially in remote or rural areas. CBEs should be accessible to individuals within a 5-10Km radius from their residence. Strengthen zonal hubs' (public/private) ultrasonography and diagnostic mammography capacity, and introduce mobile units to periodically cover remote villages. Set turnaround time for pathology with needle biopsy at ≤ 14 days. Adopt GBCI targets nationally: $\geq 60\%$ of invasive cancers at stage I–II; ≤ 60 days from abnormal CBE to diagnosis; $\geq 80\%$ treatment completion.

Introduce patient navigators to reduce the burden of following through the care pathway on patients and their caregivers and minimize treatment abandonment. The Cancer Health Fund (CHF) and National Health Insurance Agency (NHIA) should be strengthened to minimize out-of-pocket (OOP) expenditure.

Ensure data collection at PHCs and diagnostic hubs. Minimal data sets such as age, risk flags, CBE result, imaging result, biopsy, stage, and dates should be kept for interval monitoring and linkage to cancer registries.

It has been argued that OOP expenditure for screening mammography is not viable; as such, government-funded schemes such as CHF and NHIA should be strengthened, and provide bundled payments for the entire diagnostic episode, i.e. CBE – imaging – core biopsy. In addition, targeted subsidization for women 40 – 69 years and high-risk individuals can maximize equity and impact.

Training nurses and CHWs with competency checklists and periodic mentoring, as well as upskilling radiographers and medical officers in diagnostic ultrasonography and core needle biopsy with periodic mentoring from radiologists, surgeons, and pathologists, constitutes critical workforce development.

CONCLUSION

Nigeria's path to meaningful mortality reduction from breast cancer will not be paved by technology alone. The opportunity lies in designing for reality: rooting early detection in PHC-delivered CBE, creating fast and affordable diagnostic pathways, protecting women from financial hardship, and measuring what matters—time to diagnosis, stage at presentation, and treatment completion. With NSCCP 2023–2027 and NICRAT providing policy scaffolding, the next step is disciplined execution: train, navigate, finance, and track. If Nigeria can reach GBCI targets—diagnosing the majority at stage I–II and compressing diagnostic

intervals—mortality will begin to fall, and the lived experience of women with breast symptoms will change from delayed diagnosis and loss to timely care and survival.

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