Need Profile: Breast Cancer

Last updated: March10, 2026

General	USA CITEC RANK: 8	LMIC CITEC RANK: 1
Age Standardized Rate Incidence	**130.8/100,000** [1]	**37.9/100,000** *(Africa)* [2], ***46.8/100,000*** *(world)* [3]
5 Year Survival (All Stages Combined)	**86%** [1]	**40%** (*Sub Saharan Africa*) [4]
Average Cost to Treat in Year 1	**$ 59,167** [1,5]	
Average # Mammography Machines/Screening Population	**142/1,000,000** *(2010)* [6]	**2/1,000,000** *(Ghana)* [7]
# Radiologists/Population	**166.7/1,000,000** [8]	**16.7/1,000,000** *(Nigeria)* [8]

Screening:
Women over 40

SCREENING METHODS

Clinical Breast Exam

- Sensitivity: **54.1%** [9]
- Specificity: **94%** [9]

Mammogram (3D): X-ray Imaging to detect early tumors

- Sensitivity: **81%** [10]
- Specificity: **98%** [10]

Diagnosis

Mammogram (3D)
Sensitivity: **84.5% (low breast density), 65.8% (high breast density)** [11]
Specificity: **98%** [10]

Breast Ultrasound
Sensitivity: **76%** [11]
Specificity: **84%** [11]
**Useful to differentiate between solid tumors and cysts*
**Useful in screening women under 30, or with dense breasts*
**Cannot confirm diagnosis with only ultrasound*

Breast MRI
Sensitivity: **95%** [11]
Specificity: **30–90%** [12]
**Used for high-risk patients to provide detailed imaging*

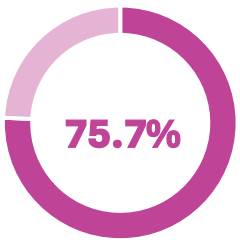
Breast Biopsy-Fine Needle Aspiration (FNA)
Sensitivity: **74%** [13]
Specificity: **96%** [13]
**Thin needle and vacuum syringe, efficacy dependent on aspirator and cytologist experience level*

Breast Biopsy-Core Needle Biopsy (CNB)
Sensitivity: **87%** [13]
Specificity: **98%** [13]
**Examines more material than FNA as tissue samples are larger, marker placement after*

Breast Cancer Summary:

Breast Cancer is a commonly occurring cancer worldwide with well established screening tools. In the US, screening uptake is over 75% and the cancer is frequently caught at the local stage with high survival. In resource-constrained areas, access to mammography is limited and survival outcomes are poorer.

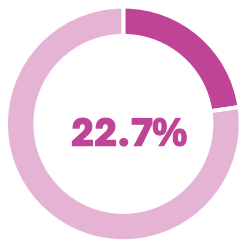
US
screening uptake [14]



US Needs:

- For patients with dense breast tissue, there is a need to develop a more effective way to screen for breast cancer than mammography to improve screening.
- There is a need to improve uptake and access for supplemental screening in black women with dense breasts to improve screening accuracy and outcomes. [16]
- There is a need to harmonize the recommendations for breast cancer screening in the US to improve survival outcomes and reduce confusion. [17]
- There is a need to improve the standardized image acquisition, quality, and accuracy of mammography and ultrasound images of the breast by providers with less training to improve diagnostic accuracy.

LMIC
screening uptake [15]

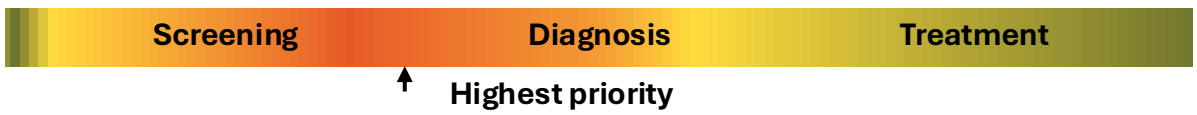


LMIC Needs:

- There is a need for accessible breast cancer early detection in low-resource, energy-insecure areas with reduced infrastructure to enhance screening usability and improve early detection. *(Possibly a non-radiological tool)*
- There is a need to increase the accessibility and standardization of training models for Clinical Breast Exams (CBE) in resource constrained settings to improve effectiveness when CBE is used without mammography.
- There is a need to reduce late diagnoses of breast cancer in women living in countries where mammography and regular screening are not available to improve long-term survival outcomes.
- There is a need to improve access and capacity to support percutaneous biopsy and routine biomarker testing for breast cancer diagnosis.

Global Needs:

- There is a need for a more robust, lighter, less expensive, more dependable imaging that is effective in mobile applications to improve screening in rural settings.



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Sources

[1] *Seer*Explorer*. SEER*Explorer Application. (n.d.-b). https://seer.cancer.gov/statistics-network/explorer/application.html

[2] Sharma R. Breast cancer burden in Africa: evidence from GLOBOCAN 2018. J Public Health (Oxf). 2021 Dec 10;43(4):763-771. doi: 10.1093/pubmed/fdaa099. PMID: 32657321

[3] Bray F, Laversanne M, Sung H, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2024; 74(3): 229-263. doi:10.3322/caac.21834

[4] Black, E., Richmond, R. Improving early detection of breast cancer in sub-Saharan Africa: why mammography may not be the way forward. *Global Health* **15**, 3 (2019). https://doi.org/10.1186/s12992-018-0446-6

[5] Reddy, S. R., Broder, M. S., Chang, E., Paydar, C., Chung, K. C., & Kansal, A. R. (2022). Cost of cancer management by stageat diagnosis among Medicare beneficiaries. *Current Medical Research and Opinion*, *38*(8), 1285–1294. https://doi.org/10.1080/03007995.2022.2047536

[6] Elkin EB, Atoria CL, Leoce N, Bach PB, Schrag D. Changes in the availability of screening mammography, 2000-2010. Cancer. 2013 Nov 1;119(21):3847-53. doi: 10.1002/cncr.28305. Epub 2013 Aug 13. PMID: 23943323; PMCID: PMC3805680.

[7] Price, M. D., Mali, M. E., Dedey, F., Dzefi-Tettey, K., Li, Y., Almeida, C., Brownson, K. E., Price, R. R., & Sutherland, E. K. (2024). Mammography and breast ultrasonography services in Ghana, availability, and geographic access. *JCO Global Oncology*, (10). https://doi.org/10.1200/go.24.00218

[8] Udam NG, Obaje PA, Emegoakor AC, Edache EL, Obaje EO, Oladosu AO, AbdulKadir A, Nneji DT, Odusola OD, Ofem AC, Farate A, Bachi FS, Nwabunike MO, Edward A, Nwaogu KC. Factors influencing the choice of radiology as a specialty among clinical-year medical students in Nigeria: a multi-center cross-sectional study. BMC Med Educ. 2025 Oct 21;25(1):1452. doi: 10.1186/s12909-025-08067-w. PMID: 41121301; PMCID: PMC12539099.

[9] Ngan, T.T., Nguyen, N.T.Q., Van Minh, H. *et al.* Effectiveness of clinical breast examination as a 'stand-alone' screening modality: an overview of systematic reviews. *BMC Cancer* **20**, 1070 (2020). https://doi.org/10.1186/s12885-020-07521-w

[10] Libesman S, Zackrisson S, Hofvind S, et al. An individual participant data meta-analysis of breast cancer detection and recall rates for digital breast tomosynthesis versus digital mammography population screening. Clin Breast Cancer. 22(5):e647-e654, 2022.

[11] Chen HL, Zhou JQ, Chen Q, Deng YC. Comparison of the sensitivity of mammography, ultrasound, magnetic resonance imaging and combinations of these imaging modalities for the detection of small (≤2 cm) breast cancer. Medicine (Baltimore). 2021 Jul 2;100(26):e26531. doi: 10.1097/MD.0000000000026531. PMID: 34190189; PMCID: PMC8257894.

[12] American Society of Breast Surgeons. (2018). Diagnostic and screening magnetic resonance imaging of the breast P urpose. <https://www.breastsurgeons.org/docs/statements/asbrs-mri.pdf>

[13] Wang M, He X, Chang Y, Sun G, Thabane L. A sensitivity and specificity comparison of fine needle aspiration cytology and core needle biopsy in evaluation of suspicious breast lesions: A systematic review and meta-analysis. Breast. 2017 Feb;31:157-166. doi: 10.1016/j.breast.2016.11.009. Epub 2016 Nov 17. PMID: 27866091.

[14] *Breast cancer screening*. Cancer Trends Progress Report. (n.d.). https://progressreport.cancer.gov/detection/breast_cancer

[15] Ebrahimoghli R, Aghaei MH, Azami-Aghdash S, Houssami N. Uptake of breast cancer screening practices in low- and middle-income countries: a systematic review and meta-analysis. J Natl Cancer Inst. 2025 Jan 1;117(1):29-39. doi: 10.1093/jnci/djae187. PMID: 39133184.

[16] American Association for Cancer Research. (2024, May 16). *Disparities in cancer screening for early detection - CDPR22*. Cancer Progress Report. https://cancerprogressreport.aacr.org/disparities/cdpr22-contents/cdpr22-disparities-in-cancer-screening-for-early-detection/

[17] Sile, E. (2025, July 23). *USPSTF's new breast cancer screening guidelines: BCRF*. Breast Cancer Research Foundation. https://www.bcrf.org/blog/uspstf-new-breast-cancer-screening-guidelines-2023/#:~:text=Under%20a%20risk%2Dbased%20screening,a%20risk%2Dbased%20protocol."