

ARTIFICIAL INTELLIGENCE IN BREAST IMAGING: A SYSTEMATIC REVIEW OF THE CURRENT SITUATION IN AFRICA

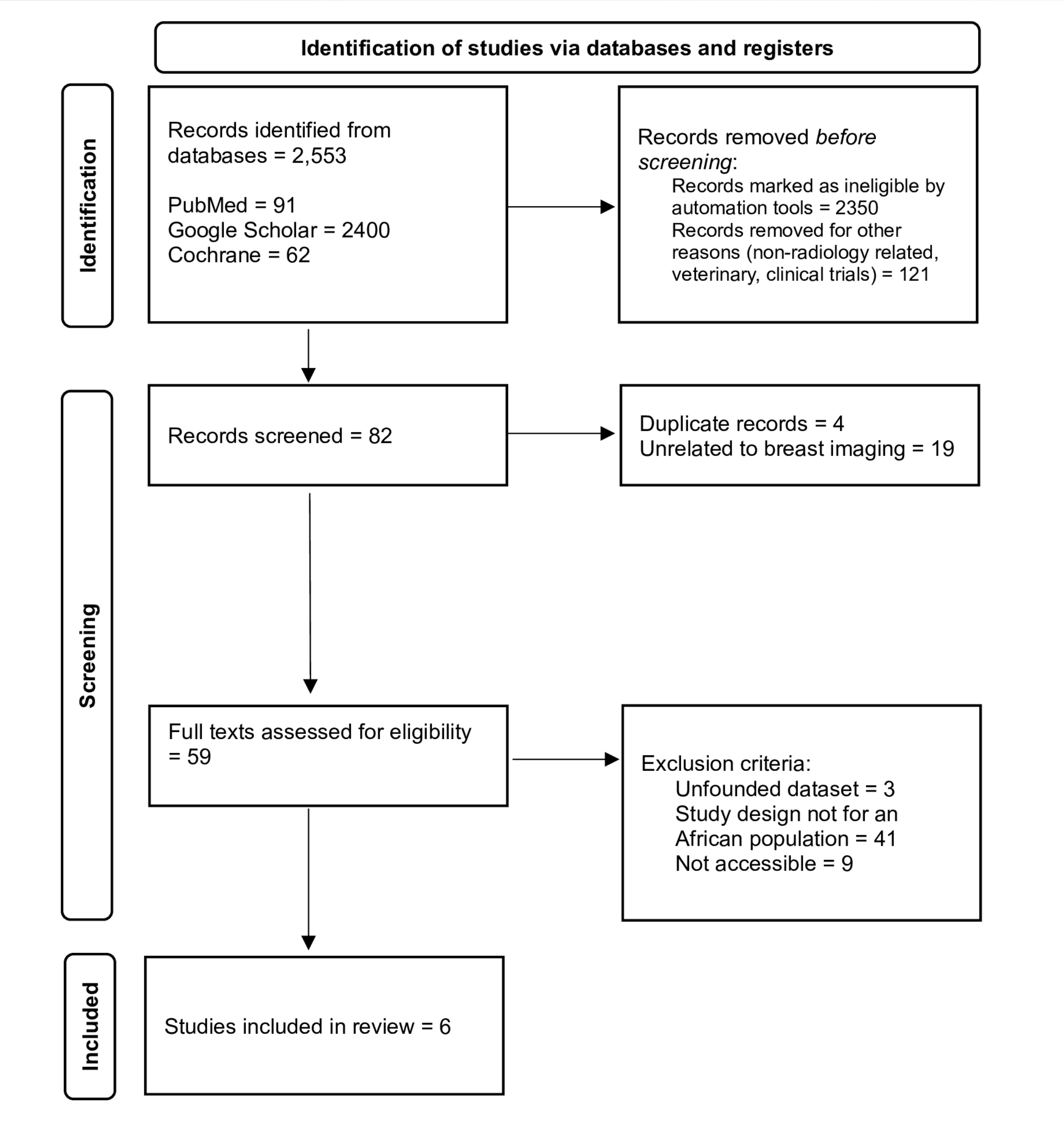
Babajide Imran Wale-Akinyemi¹, Elizabeth AyoOluwa Idowu¹, Adenike Temitayo Adeniji-Sofoluwe^{1,2}

¹. Department of Radiology, University College Hospital, Ibadan, Nigeria
². Faculty of Clinical Sciences, College of Medicine, University of Ibadan, Ibadan, Nigeria

PURPOSE: There is alarming rise in the global statistics of breast cancer with mortality rate of 60% domicile in Africa¹. Early diagnosis improves prognosis and the use of artificial intelligence, AI enhances it². This study scientifically reviewed the current situation in Africa with the use of AI in breast imaging, and made evidence-based projections.

METHODS AND MATERIALS

This is summarized in the chat below using PRISMA guideline³: Figure 1.



Key words: Artificial intelligence, AI, breast imaging, mammography, Africa, low and middle income countries, machine learning, deep learning

R E S U L T S

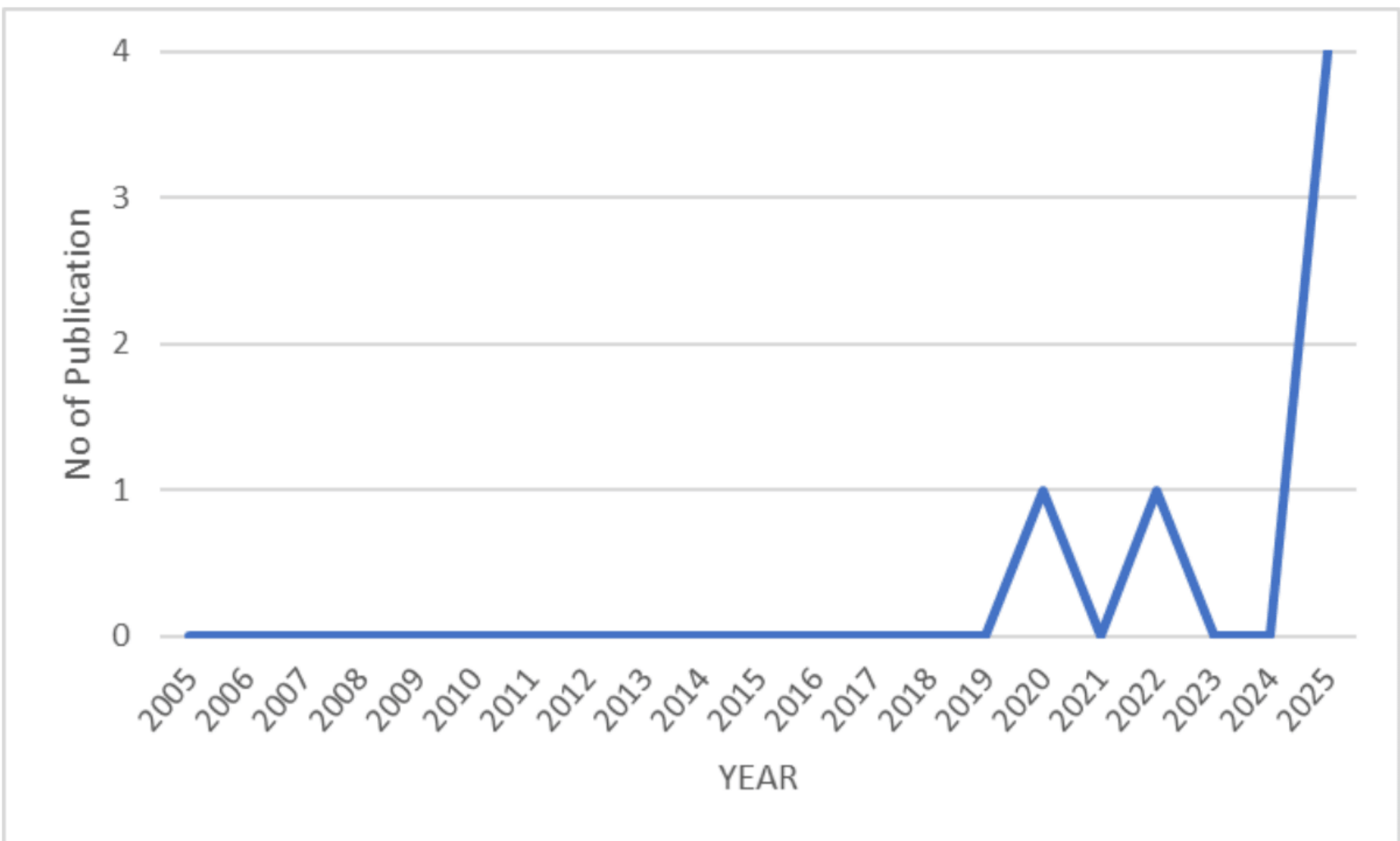


Figure 2: Number of Relevant Publications per Year, in the last 20 years

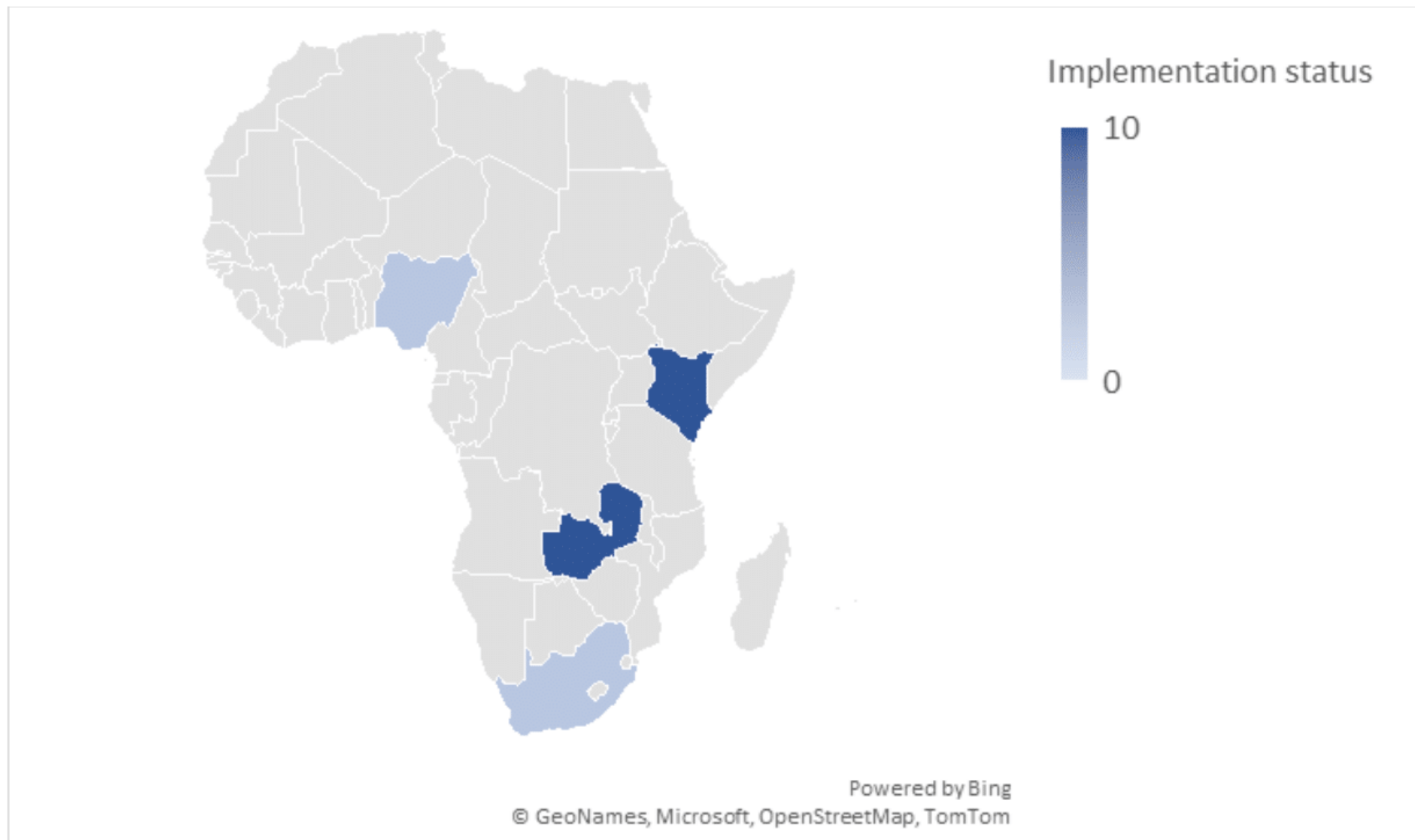


Figure 3: Application of AI in Breast Imaging: Distribution in Africa as at the time of this review

There is no identifiable publication in Africa on the subject in the last 20 years until 5 years ago. Only six (6) defined AI algorithms for breast imaging are found in the continent hitherto. 33% (2) is being implemented involving Kenya and Zambia, 67% (4) identified in sub-Saharan Africa are only proposals. The vast majority of the countries and regions in the continent are not proximal to the success in eastern and southern Africa.

Table 1: Summary of the six (6) records included in the review

S/N	Title	Authors	Journal	Type	Year of Publication	Country of Study Design	Region	Theme	Implementation Status
1	Promoting Breast Cancer Screening Among Underserved Women: An On-Site Dual Approach Involving Breast Health Education and AI-Assisted 3D Mobile Mammography	Chigbundu et al	Trends in Telemedicine and E-Health, TTEH	Research paper	2025	Nigeria	Western Africa	Screening	Proposal
2.	Artificial Intelligence in Low- and Middle-Income Countries: Innovating Global Health Radiology	Mollura et al	Radiographics	Review article	2020	LMICs	-	Screening and diagnosis	Proposal
3.	Leveraging Algorithmic and Machine Learning Technologies for Breast Cancer Management in Sub-Saharan Africa	Frank et al	International Journal of Medical and All Body Health Research	Review article	2022	Sub-Saharan Africa	Western, Eastern, Central and Southern Africa	Management	Proposal
4.	Revolutionizing Breast Cancer Screening: Integrating Artificial Intelligence With Clinical Examination for Targeted Care in South Africa	Kathryn Malherbe	Journal of Radiology Nursing	Review article	2025	South Africa	Southern Africa	Screening	Proposal
5.	Prospective Blinded evaluation of Thermalix, an artificial intelligence-enhanced breast thermal imaging software, correlated with radiologist-interpreted mammograms: Results of an exploratory study in Zambia	Mwale et al	medRxiv	Research paper	2025	Zambia	Southern Africa	Screening and Diagnosis	Implemented
6.	Fuzzy Logic Predictive Model for Early Diagnosis and Prognosis of Breast and Prostate Cancer	Shitsukane et al	IST-Africa	Conference paper	2025	Kenya	East Africa	Screening and diagnosis	Implemented

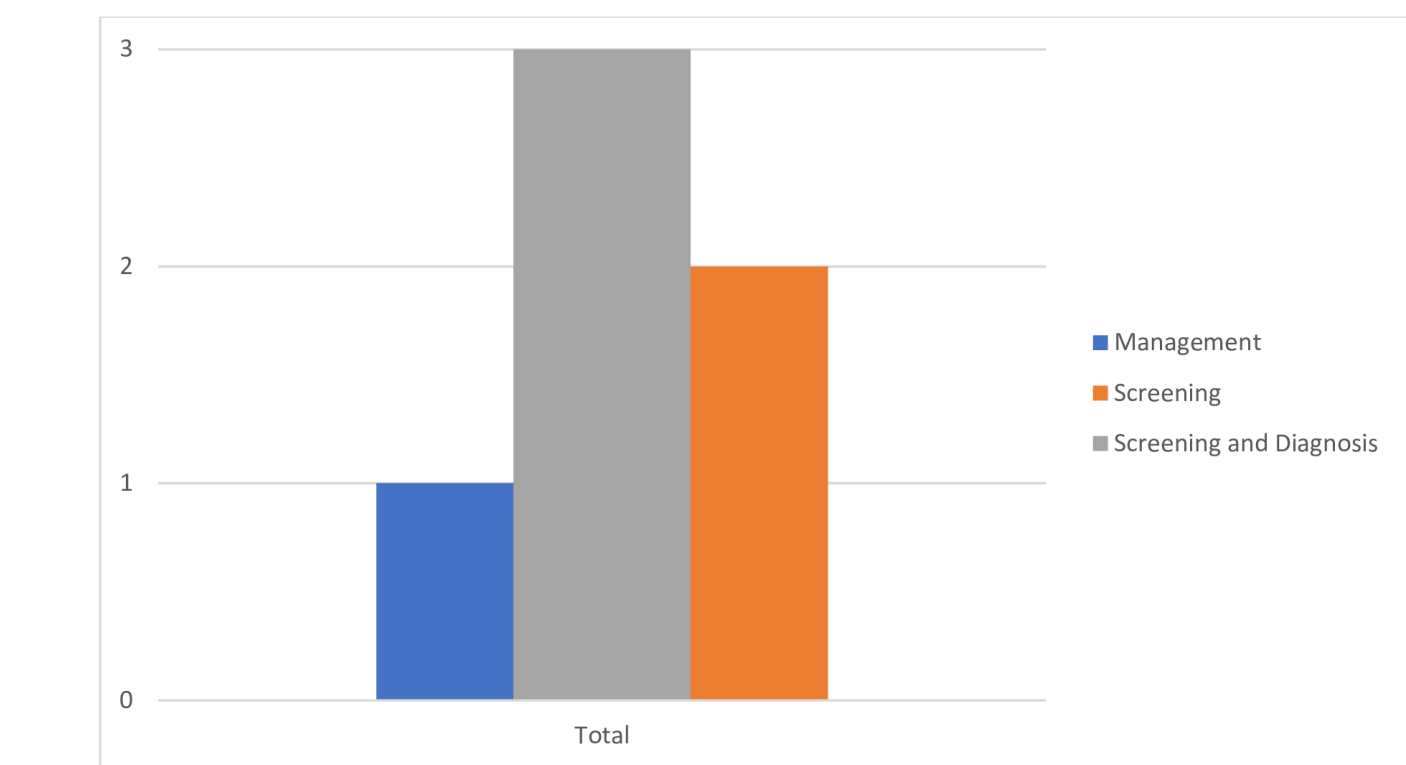


Figure 4: Theme of Designed or Proposed AI Algorithm

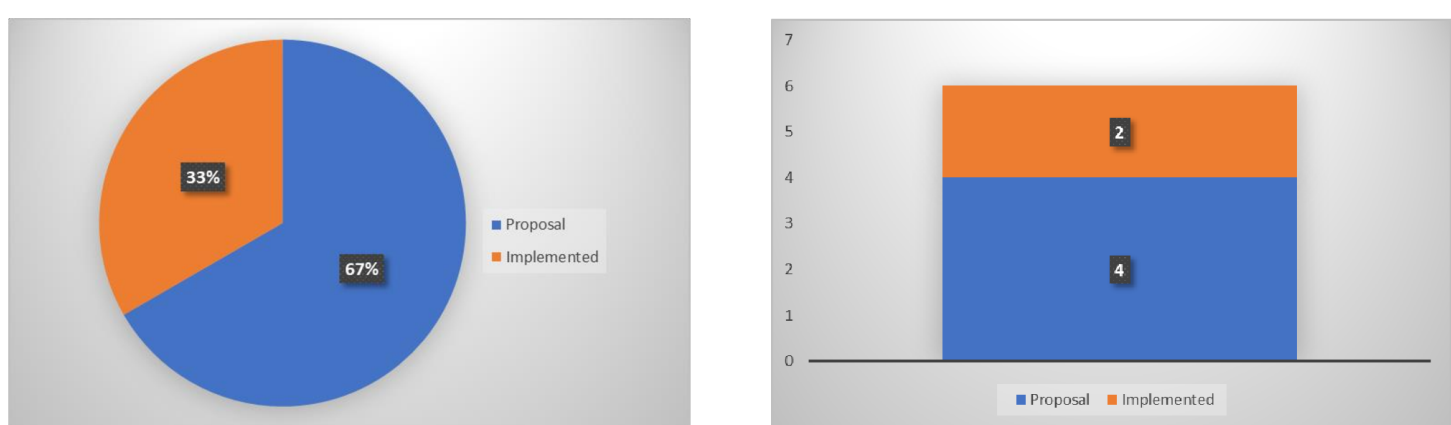


Figure 5: Implementation Status

CONCLUSION: Evidently, more implementation of AI in breast imaging is required in Africa. The burden of breast cancer in the continent calls for urgent collection of datasets for machine learning and computed aided diagnosis. Funding and inclusion of AI in radiological training curriculum are required to facilitate this course. Algorithm designed for dataset elsewhere could be adopted to save implementation cost. A future agenda is to keep track of progress and review the situation in the next five (5) years. Similar review is recommended in other radiological subspecialties. It is also advisable to document and publish any relevant stride in the region henceforth to avoid underestimation of the progress being made.

REFERENCES

- McCormack V, McKenzie F, Foerster M, Zietsman A, Galukande M, Adisa C, et al. Breast cancer survival and survival gap apportionment in sub-Saharan Africa (ABC-DO): a prospective cohort study. *Lancet Glob Health*. 2020 Sep 1;8(9):e1203–1206.
- Chia JLL, He GS, Ngiam KY, Hartman M, Ng QX, Goh SSN. Harnessing Artificial Intelligence to Enhance Global Breast Cancer Care: A Scoping Review of Applications, Outcomes, and Challenges. Vol. 17, *Cancers*. Multidisciplinary Digital Publishing Institute (MDPI); 2025.
- Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ [Internet]*. 2021 Mar 29 [cited 2025 Oct 22];372.