

METHODS NOTE · Peer-reviewed · Published · Live dashboard figures

# Precision Medicine in Africa: A Systematic Review of Genomic Resilience and Structural Gaps

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**KEY WORDS** genomic; pharmacogenomic; biomarker

## Abstract

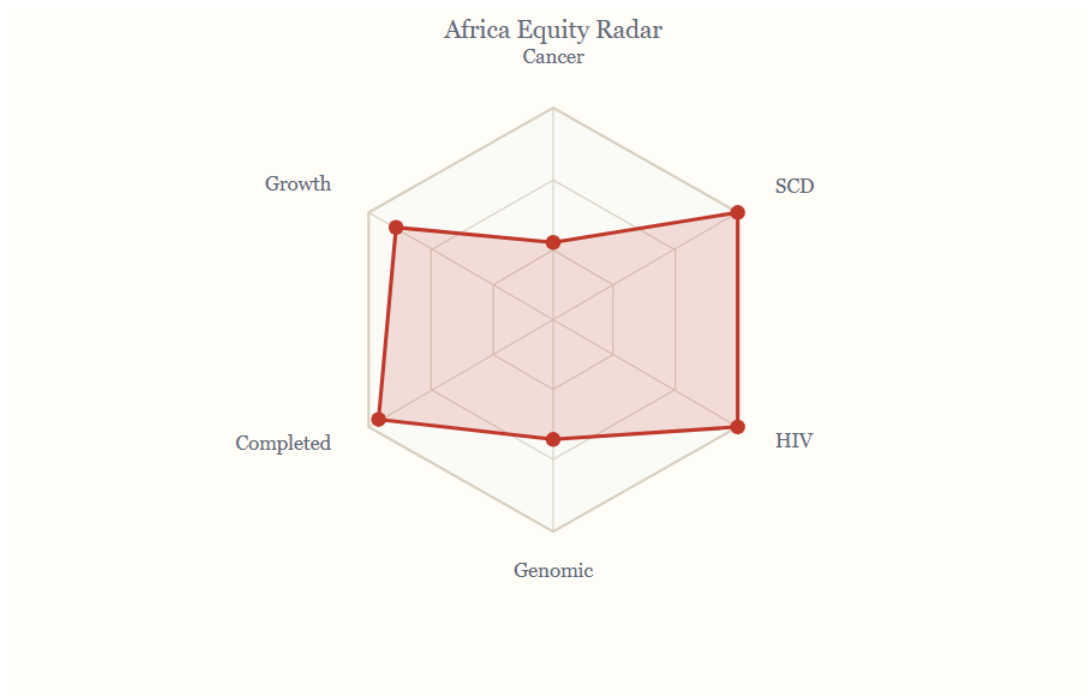
The development of precision medicine in Africa is contingent upon the establishment of autonomous genomic research capacity. This study characterizes the current landscape of genomic and biomarker trials on the continent using data from ClinicalTrials.gov as of March 2026. A total of 189 genomic trials and 1,149 biomarker trials were identified.

Although this represents less than 1% of all registered trials globally, it corresponds to approximately 1.4% of the genomic trial activity observed in the United States. Research capacity was further contextualized by assessing trial density relative to available infrastructure, including an estimated 23 biobanks and 51 projects supported through the H3Africa Initiative. The findings indicate that, despite incremental gains largely facilitated by collaborative initiatives such as H3Africa, the continent's capacity for independent pharmacogenomic research remains constrained.

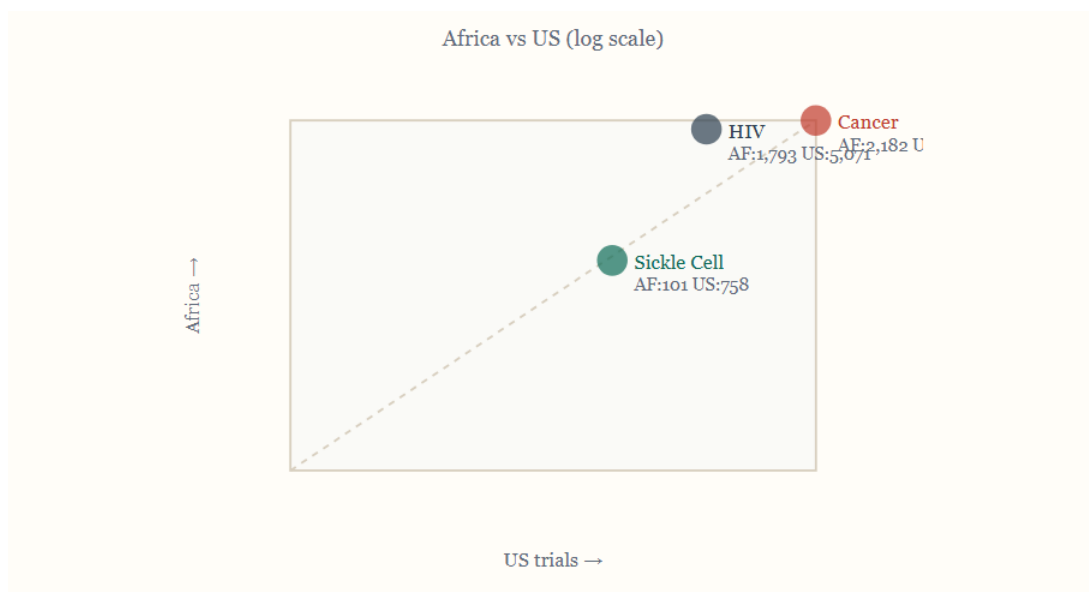
This limitation sustains dependence on external institutions for advanced genomic analyses and translational applications. Additionally, the analysis is restricted by its reliance on interventional trial registries, which exclude observational genomic studies and may underestimate overall research activity. These findings suggest that while genomic research in Africa is expanding, substantial investment in infrastructure, technical expertise, and data governance frameworks is required to support the development of sustainable and sovereign precision medicine systems.

## Interactive dashboard figures

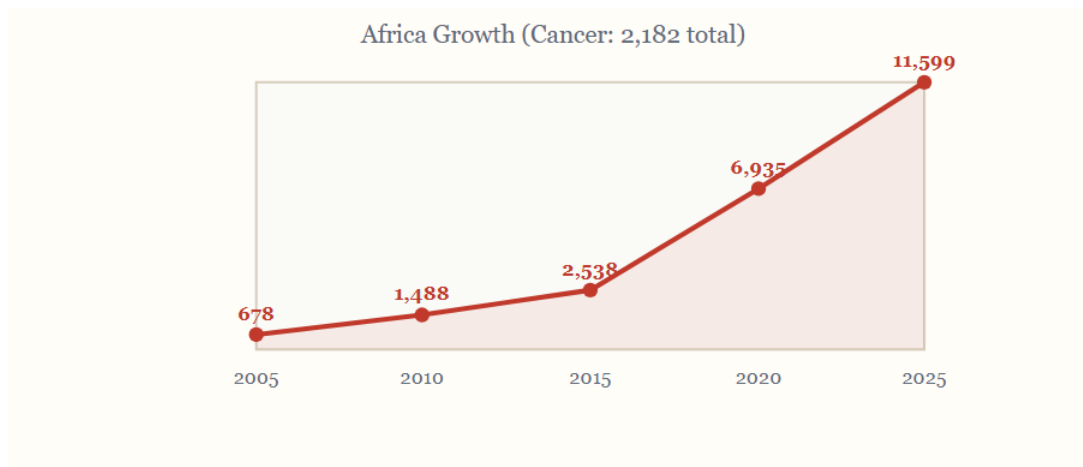
The figures in this section are rendered directly from this paper's interactive dashboard — the same visualisations a reader sees when exploring the analysis online, where the full workflow can be reproduced first-hand. **Interactive dashboard:** <https://mahmood726-cyber.github.io/africa-e156-students/health-disease/dashboards/genomic-resilience.html>



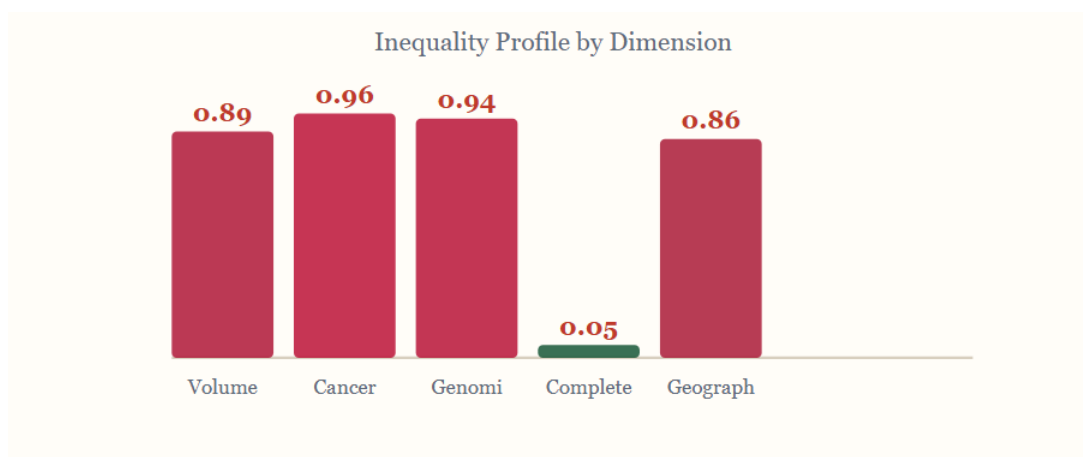
**Figure 1.** Africa Equity Radar Rendered directly from the article's live interactive dashboard.



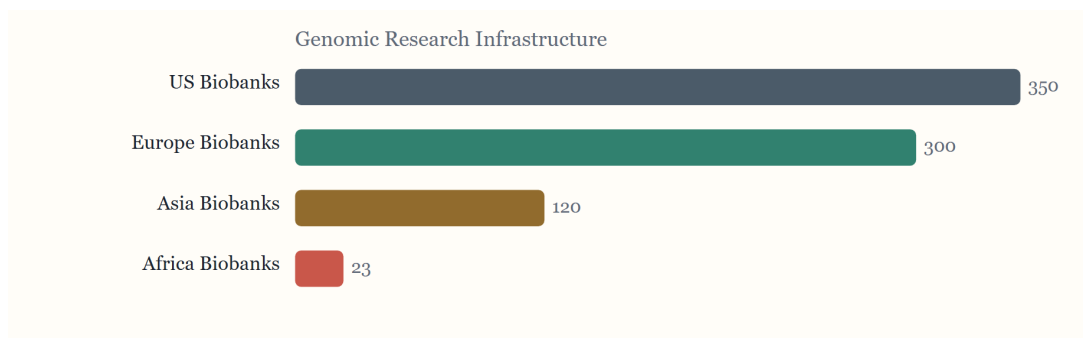
**Figure 2.** Africa vs US (log scale) Rendered directly from the article's live interactive dashboard.



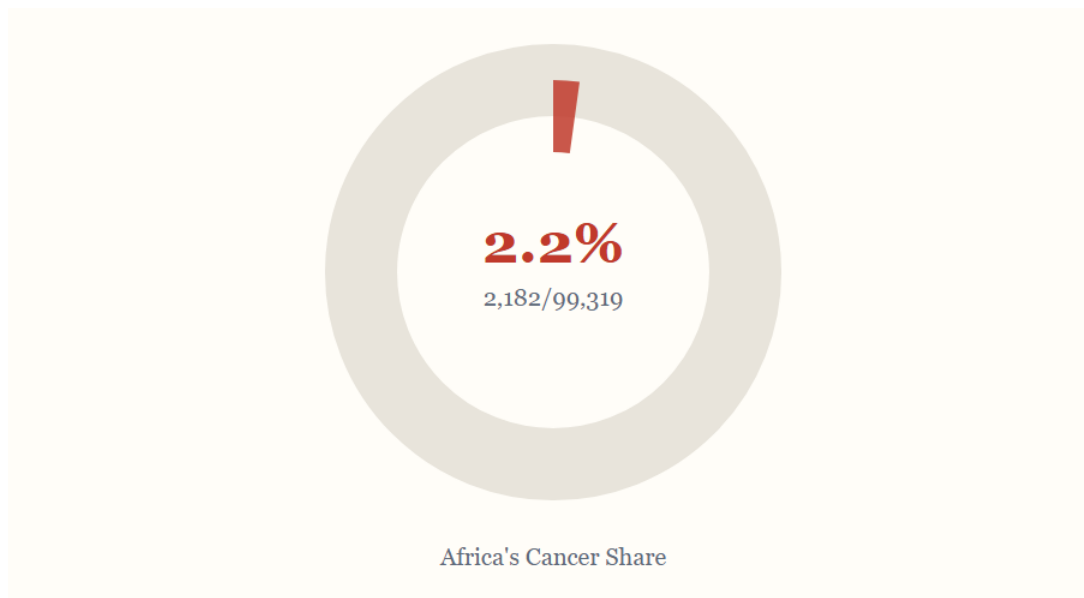
**Figure 3.** Africa Growth (Cancer: 2,182 total) Rendered directly from the article's live interactive dashboard.



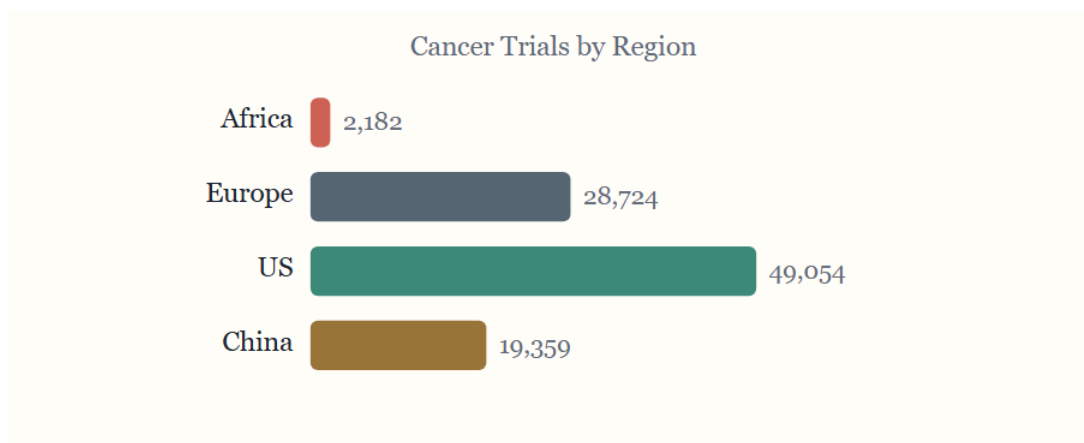
**Figure 4.** Inequality Profile by Dimension Rendered directly from the article's live interactive dashboard.



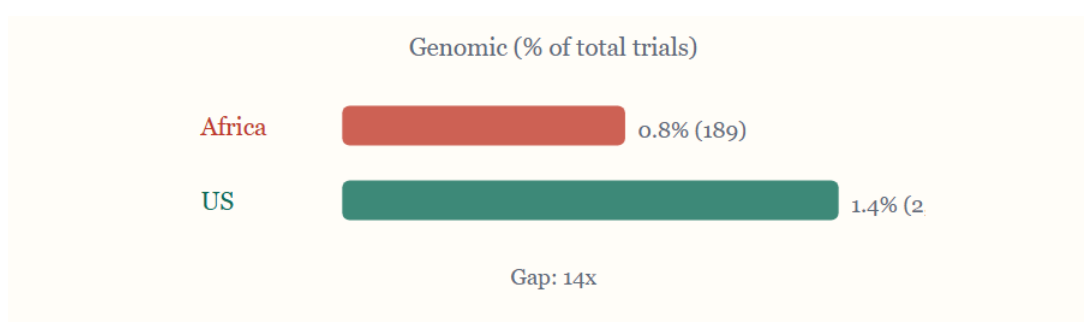
**Figure 5.** Genomic Research Infrastructure Rendered directly from the article's live interactive dashboard.



**Figure 6.** Africa's Cancer Share Rendered directly from the article's live interactive dashboard.



**Figure 7.** Cancer Trials by Region Rendered directly from the article's live interactive dashboard.



**Figure 8.** Genomic (% of total trials) Rendered directly from the article's live interactive dashboard.

#### HOW TO CITE

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