

A Community-Driven Digital Screener for Early Dementia Detection in Malawi

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Bridging Language, Access, and Education Bias Through Role-Based Design

Dennis Makwakwa · Victoria McCray
dennismaqua@gmail.com · victoriapmccray@gmail.com

KEY TAKEAWAY Malawi has zero validated dementia screening tools in Chichewa — the language of 57% of the population. Grounded in a 38-study evidence review, we built an offline, role-based digital screener that adapts to patients, caregivers, and clinicians alike to close this gap.

INTRODUCTION

Sub-Saharan Africa faces a fast-growing but severely under-diagnosed dementia burden, driven by population aging, longer survival with chronic disease, and thin specialist capacity. In Malawi, detection is held back by three compounding barriers: no screening tools validated in local languages, heavy reliance on education-dependent tests, and limited access to clinical services — so impairment is often caught late, straining families and foreclosing chances for early planning and care.

FIGURE 1 · Malawi Snapshot

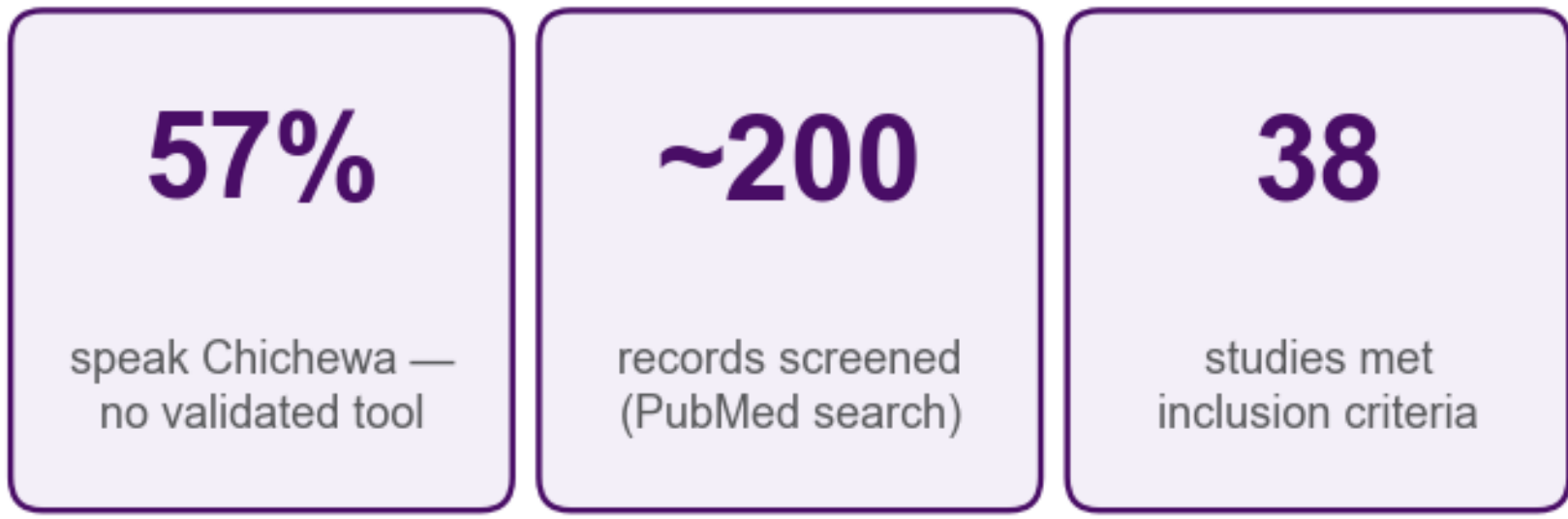
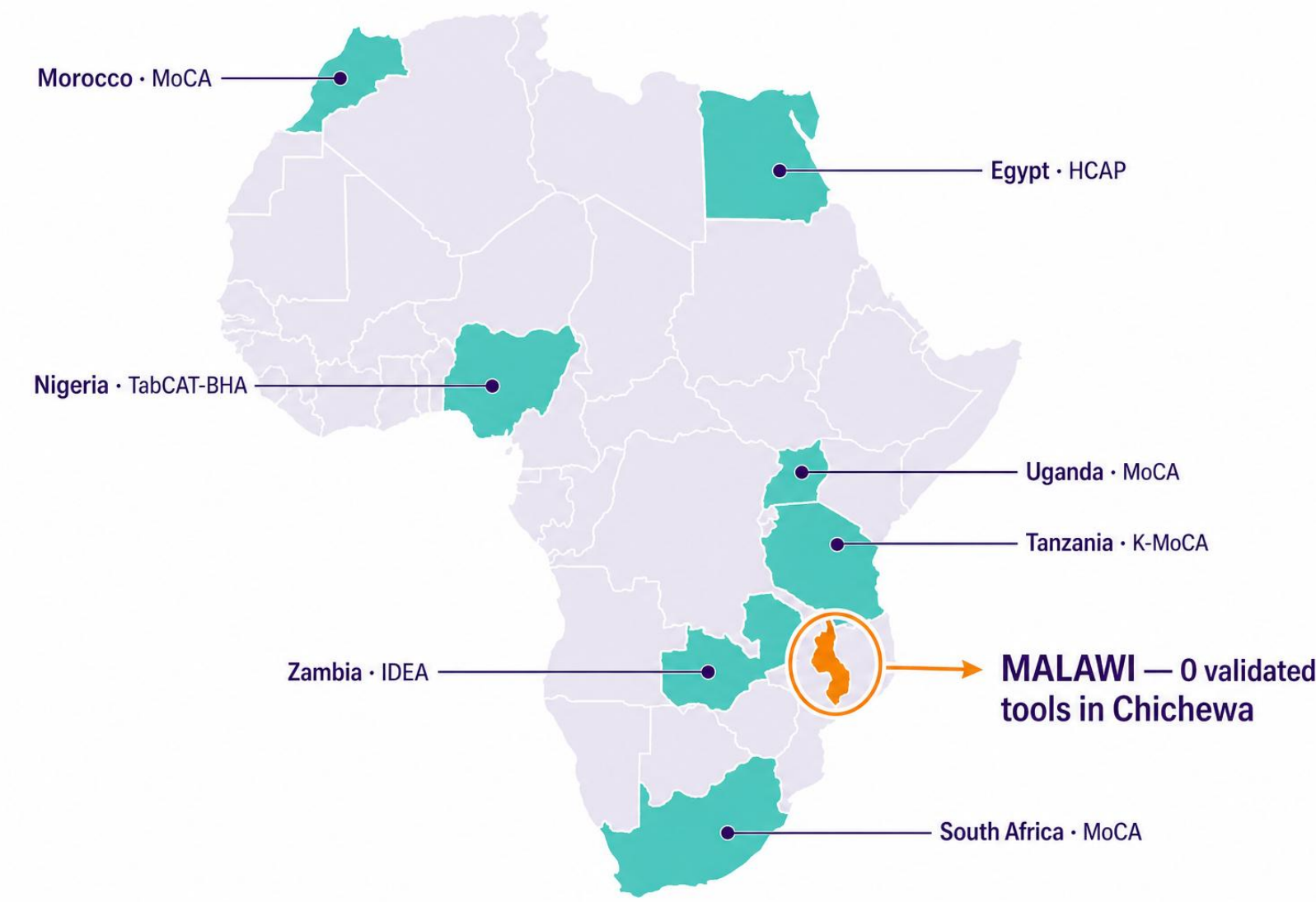


FIGURE 2 · African Validation Landscape



METHODS

We systematically reviewed PubMed for dementia and cognitive screening instruments validated in sub-Saharan Africa, extracting language, administration model, education bias, and feasibility in low-resource settings. Findings shaped a digital, role-based screening platform: items adapted from IDEA, MoCA, and HCAP, translated into Chichewa via forward–backward protocols, delivered through three modes with dynamic question routing, domain scoring, and offline-first mobile deployment.

FIGURE 3 · Study Selection Funnel

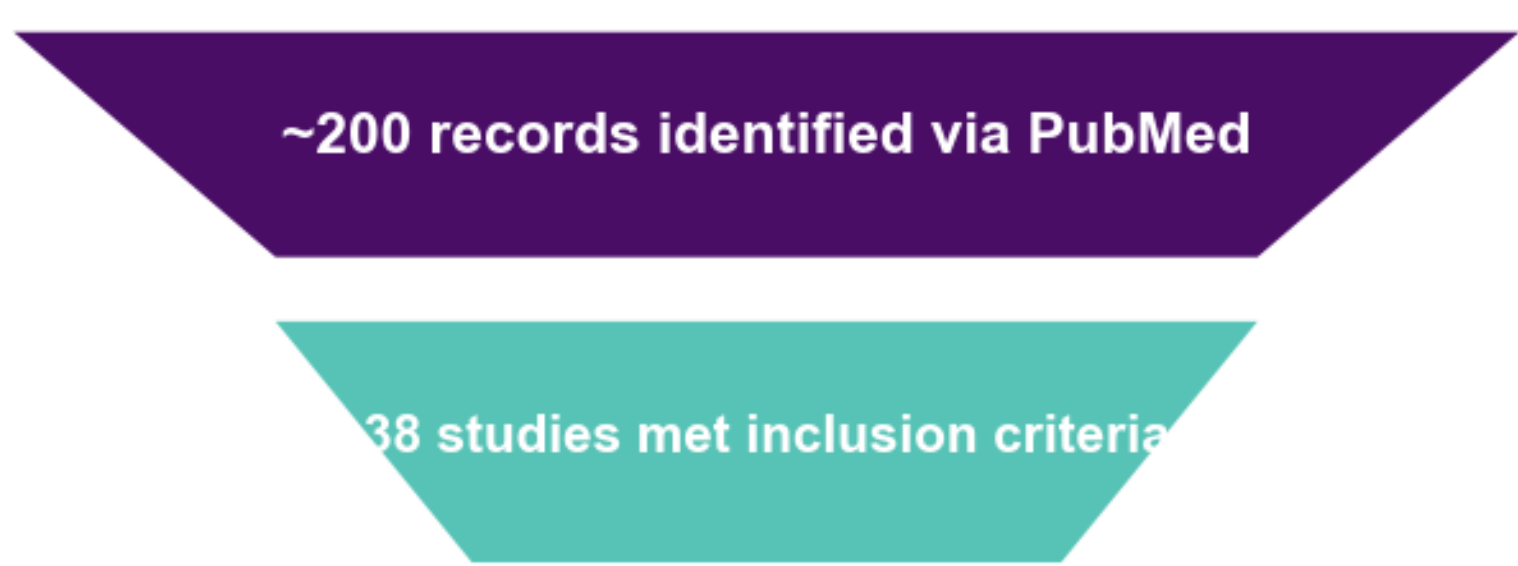
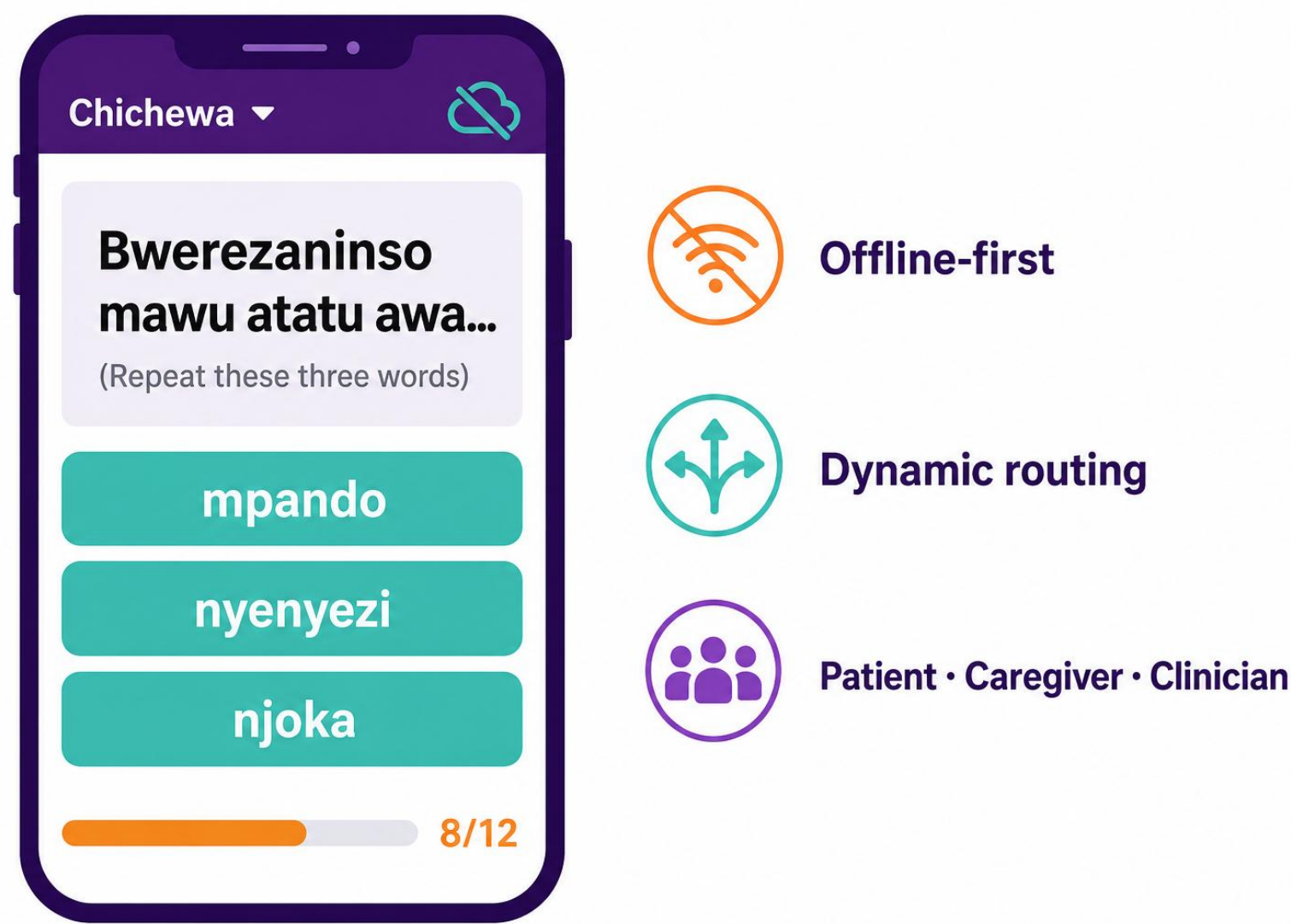


FIGURE 4 · Prototype: Role-Based Screening App



RESULTS

Of ~200 records identified, 38 studies met inclusion criteria across 13 countries. Screening tools showed moderate-to-high sensitivity (75–95%) but variable specificity, strongly shaped by education, language, and testing context. Informant-based and functional assessments consistently improved accuracy. No validated dementia screening tool exists in Chichewa. Pilot development confirms feasibility of offline assessment, role-adaptive workflows, and real-time risk stratification for low-resource settings.

FIGURE 5 · Included Studies by Country (n=38)

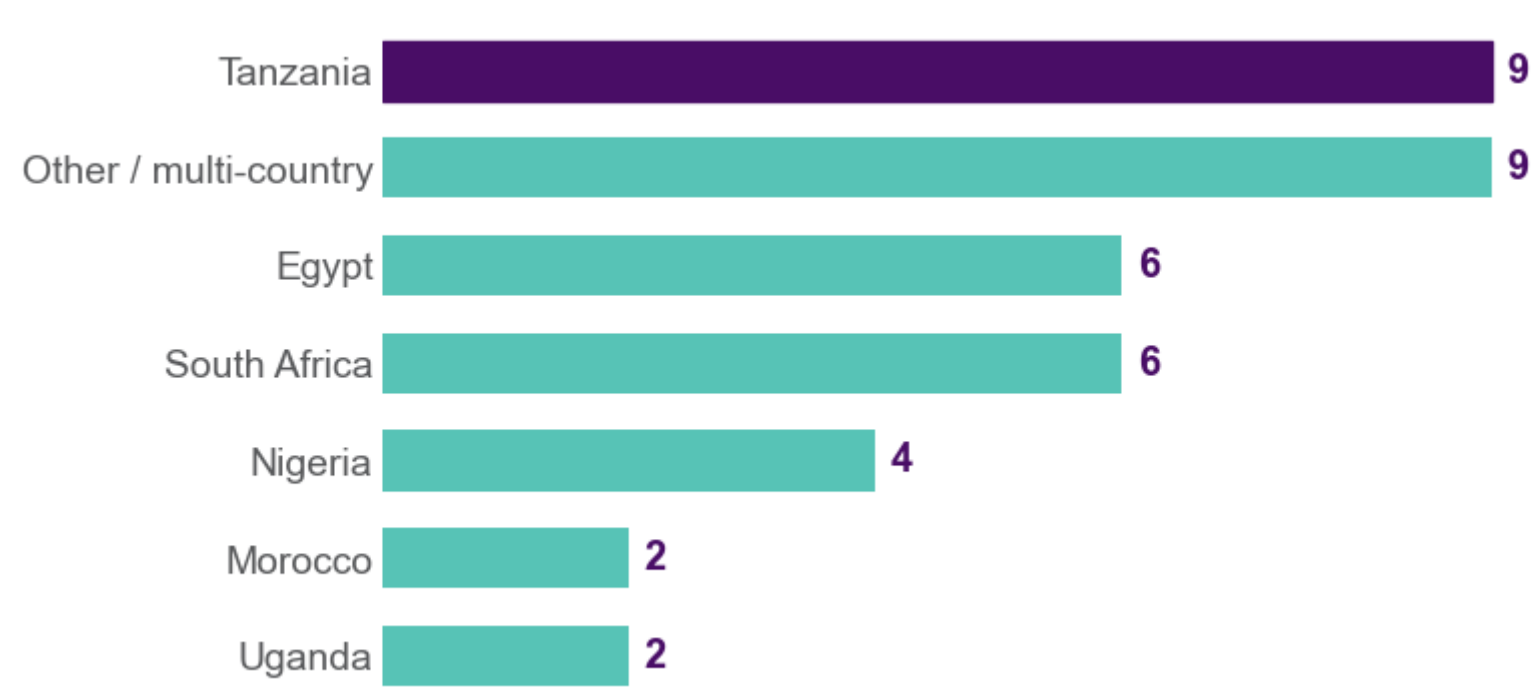
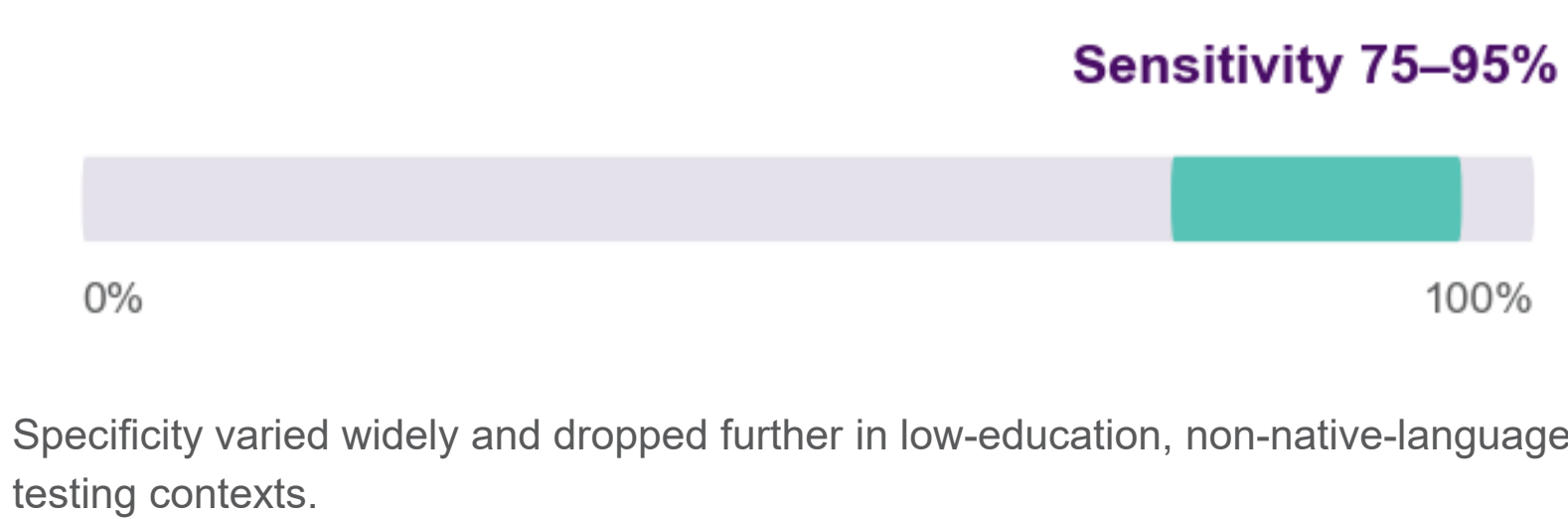


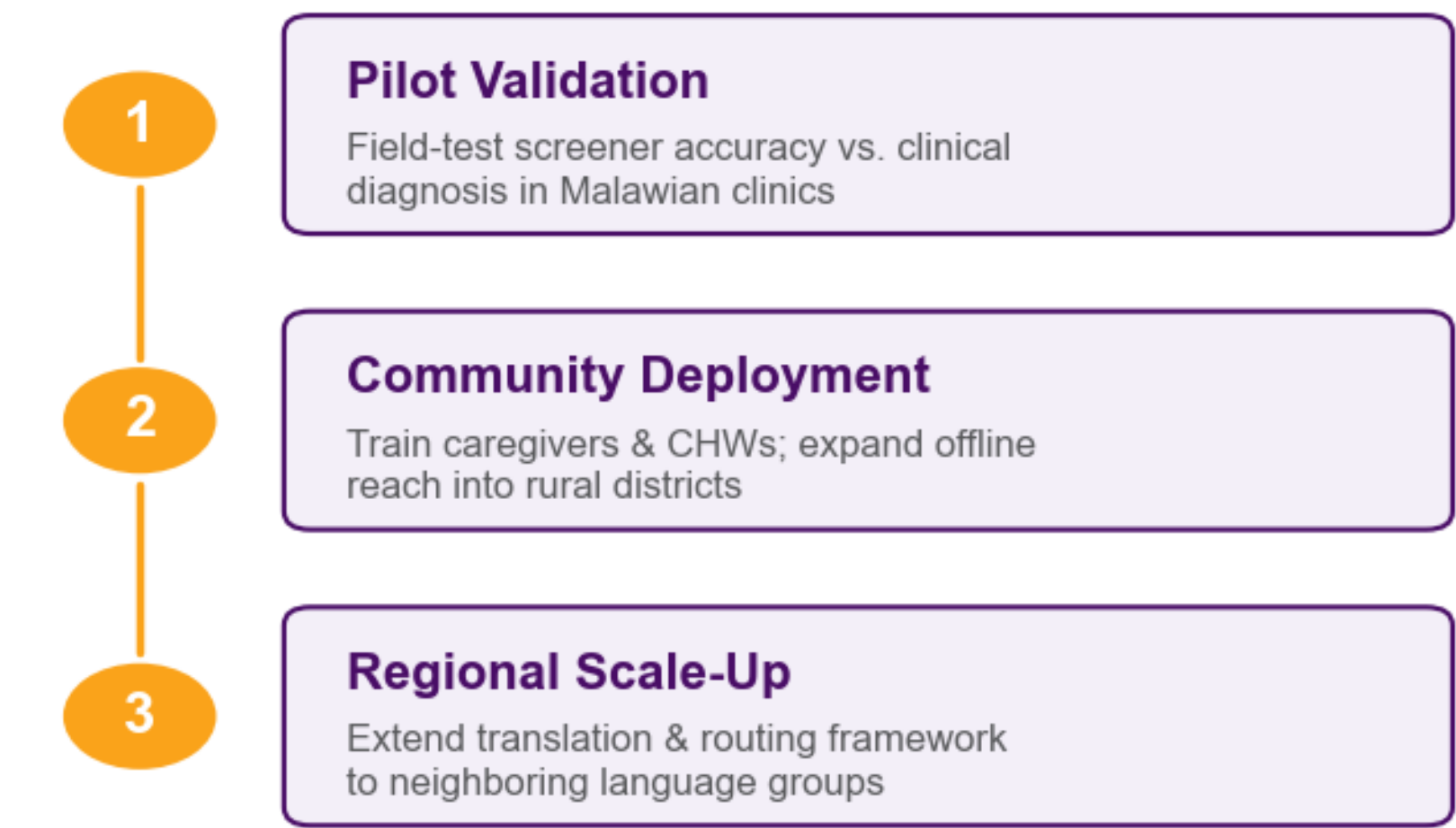
FIGURE 6 · Diagnostic Accuracy Across Tools



CONCLUSIONS

Evidence-informed digital tools can strengthen early dementia detection and epidemiological preparedness in low-income settings. By combining validated cognitive domains, Chichewa-language adaptation, caregiver integration, and offline-first design, this platform offers a scalable public-health approach to Malawi's emerging dementia burden — and a template for similar under-resourced contexts across the region.

FIGURE 7 · Path to Scale



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CONTACT

Dennis Makwakwa
dennismaqua@gmail.com
Victoria McCray
victoriapmccray@gmail.com