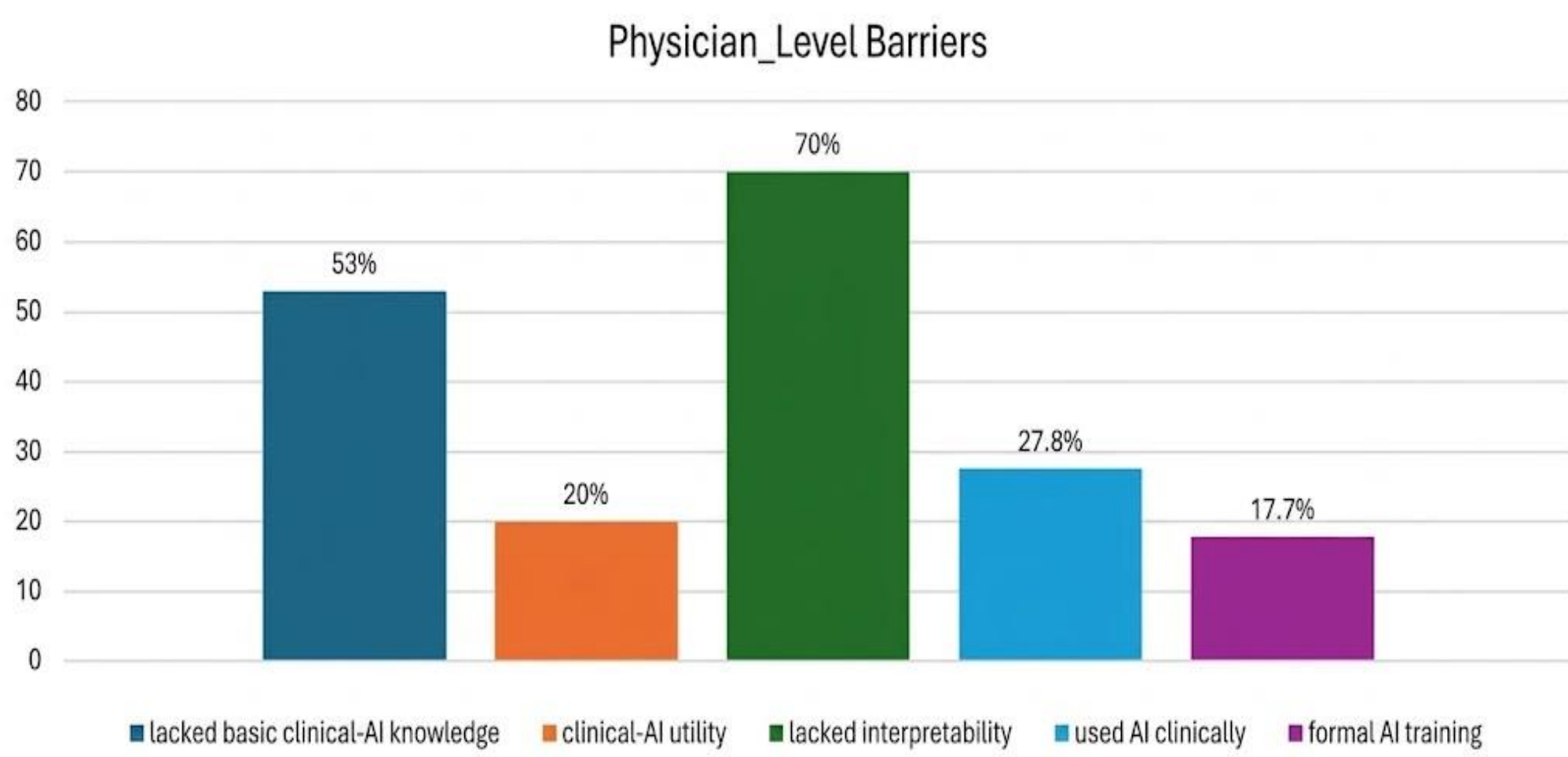


INTRODUCTION

Artificial intelligence (AI) is increasingly transforming oncology, particularly in lung cancer, through advances in imaging, early detection, treatment planning, and prognostication. However, adoption in low- and middle-income countries (LMICs) remains limited. Approximately 24% of internet users in high-income countries utilize AI tools, compared to 5.8% in upper-middle-income, 4.7% in lower-middle-income, and 0.7% in low-income countries. In Bangladesh, physician readiness is suboptimal, with 78.39% demonstrating poor knowledge and 65.58% poor practice, while attitudes remain divided (48.74% negative vs. 51.26% positive). Female physicians showed higher odds of good knowledge (AOR 3.56) and practice (AOR 2.89). Addressing these gaps is critical for integrating AI into lung cancer care pathways.

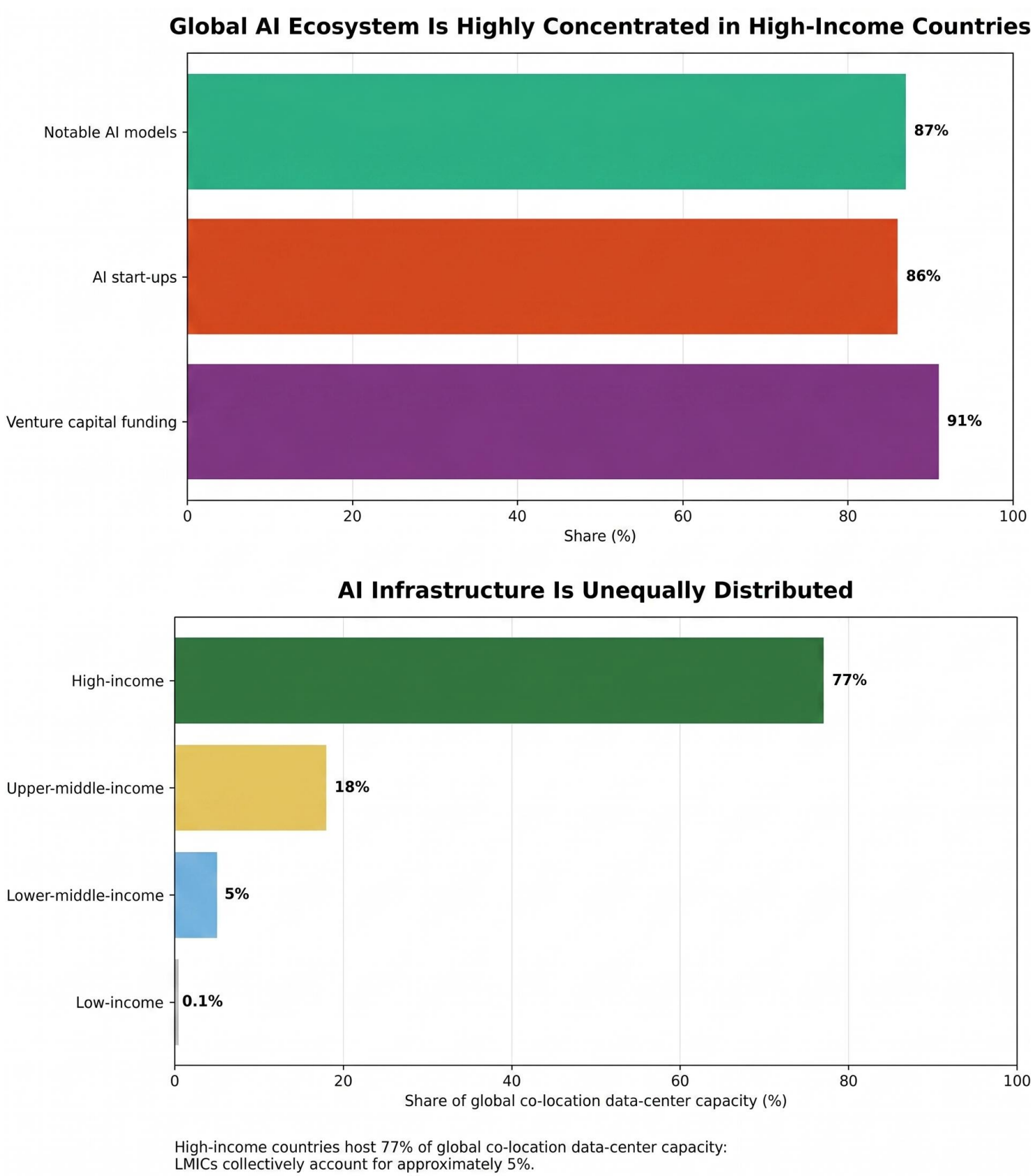
REAL-TIME SCENARIO

AI applications in lung cancer—such as radiologic nodule detection, risk stratification, and treatment response assessment—are largely confined to pilot and research settings in LMICs. High-income countries dominate the AI ecosystem, accounting for 87% of notable models, 86% of start-ups, and 91% of venture capital funding, despite representing only 17% of the global population. They also host 77% of global co-location data center capacity, compared to 18% in upper-middle-income, 5% in lower-middle-income, and <0.1% in low-income countries. While open-source platforms are expanding access, clinical implementation remains limited.



DISCUSSION

AI can improve lung cancer care in LMICs, but adoption is constrained by digital access, infrastructure, trust, and data representation. Smartphone penetration remains limited (45% among women; 57% among men), restricting digital-health reach (5). Globally, ~90–95% of notable foundational AI models are concentrated in technologically advanced settings, while ≥90% of training data for mainstream generative AI is estimated to be English- and Western-centric, creating risks of representation bias. Current healthcare AI is also concentrated on Early Detection & Diagnostics (~76–80%), with relatively fewer applications addressing Treatment Response & Management (~15–20%) and Surveillance/Post-Market Monitoring (<10%). Importantly, community voices remain largely absent: only 0.2% of published AI healthcare/public-health studies report active community or stakeholder involvement, and only 15% of health-equity AI tools incorporate community engagement into core development. Mitigation requires local validation, representative datasets, explainable AI, clinician training, interoperable infrastructure, community engagement, and sustainable governance. AI should be developed with LMIC populations—not simply deployed in LMICs.

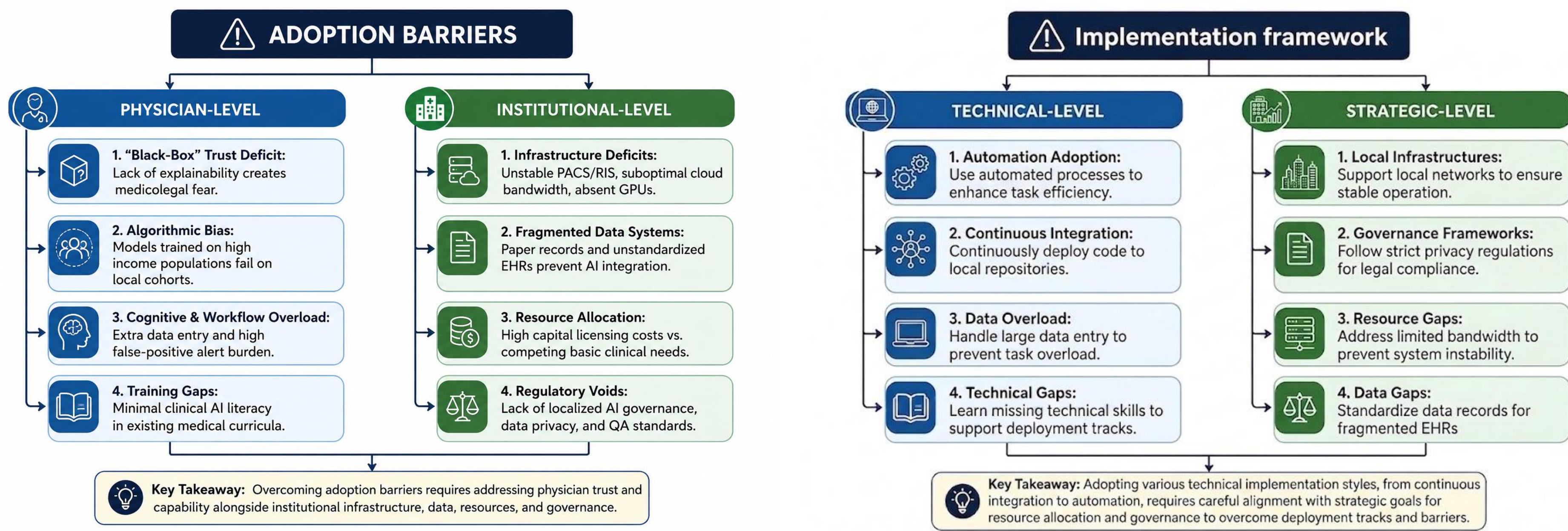


KEY MESSAGES

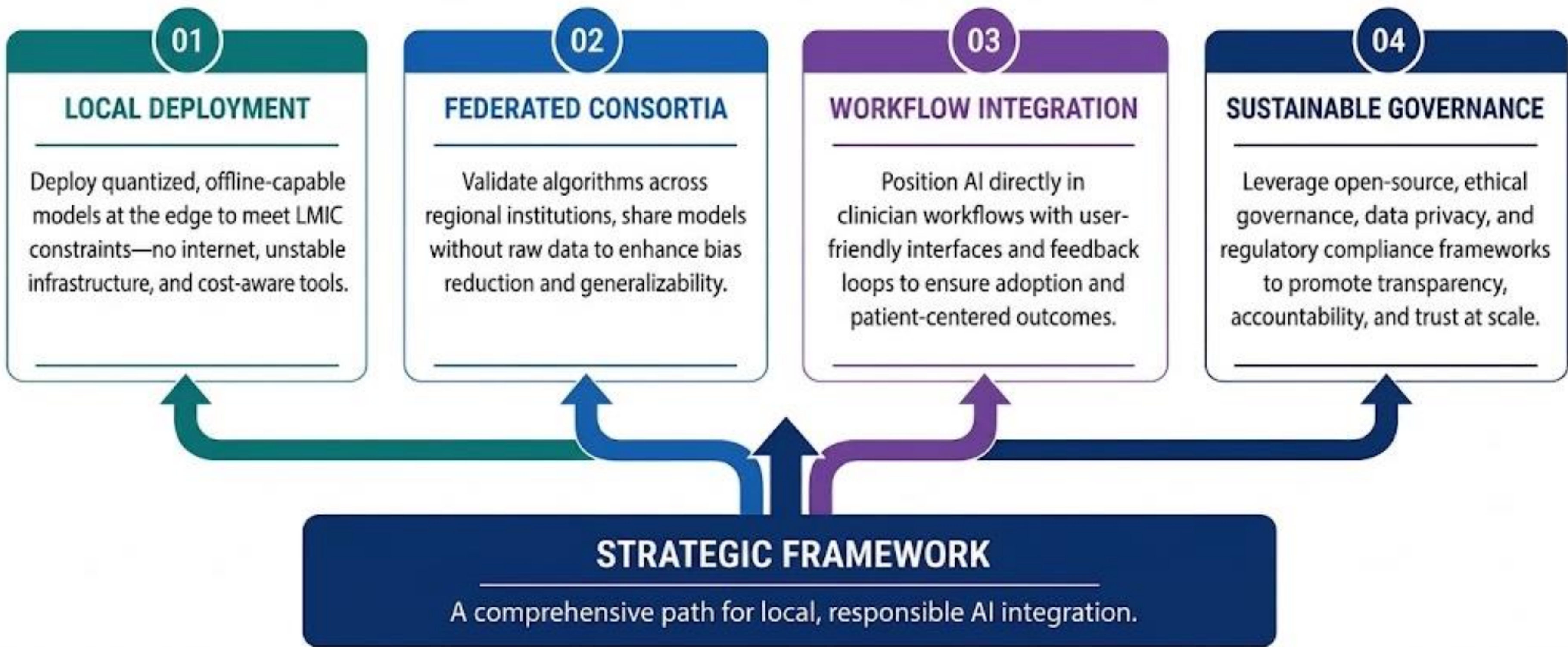
- Build trust through transparency
- Validate locally
- Integrate—not add—AI
- Design for equity
- Favor affordable, accessible, scalable solutions

CHALLENGES

Physician-level barriers include limited digital literacy, inadequate AI training, high workload, and concerns regarding reliability, interpretability, and medico-legal accountability in lung cancer decision-making. Institutional barriers include insufficient imaging and digital infrastructure, fragmented oncology data systems, lack of high-quality annotated datasets, limited regulatory and ethical frameworks, and financial constraints. Algorithmic bias and lack of local validation further hinder trust and applicability in diverse LMIC populations. A coordinated strategy is required, including integration of AI and digital oncology training into medical education and continuing professional development. Investment in imaging infrastructure, interoperable cancer registries, and data systems is essential. Establishing robust regulatory, ethical, and data governance frameworks will support safe implementation. Public-private partnerships, the development of locally validated AI models using indigenous lung cancer datasets, and the promotion of multicenter collaboration and knowledge exchange are critical to ensuring scalability and sustainability.



STRATEGIES



Conclusions: Bridging physician- and institutional-level barriers is essential to enable equitable AI integration in lung cancer care in LMICs. Strategic efforts in education, infrastructure, policy, and context-specific innovation will be key to improving early detection, treatment outcomes, and overall cancer care delivery in resource-constrained settings.