

AI in Healthcare

AI Primer, Vamshi Lingampally

From Specialist AI That Helped a Few
To Generalist AI That Can Help Many
To the Hybrid System Africa Can Design, As AI isn't just about clinical technology



WHAT WAS

WHAT IS

WHAT COULD BE

What Was — Specialist AI Joins the Team

Powerful, but narrow. AI helped a few specialists. Most of the team never touched it.



Radiology AI

Reading imaging

AI trained on millions of X-rays and scans to detect TB, breast cancer, diabetic retinopathy. The radiologist got a second pair of eyes.

Africa: CAD4TB validated in South Africa and Kenya — 94.7% sensitivity in national TB screening.



Genomics AI

Analysing sequences

AI accelerated DNA sequencing analysis from weeks to hours. Geneticists could identify mutations faster than ever before.

Africa: H3ABioNet trained over 1,000 African researchers in bioinformatics and genomic analysis.



Epidemiology AI

Tracking outbreaks

AI models predicted disease spread, tracked patterns, and flagged emerging outbreaks before human analysts could.

Africa: Africa CDC used AI-powered monitoring during COVID-19, Mpox, and Ebola responses.

The limitation: Specialist AI was powerful but narrow. The radiologist got help. The geneticist got help. But the faculty member, nurse, the community health worker with paper-based reporting, the educator, the student — most of the team never interacted with AI.

What Was — A Single Workforce Under Extraordinary Pressure

3

per 10K

Physicians in sub-Saharan Africa (WHO recommends 10+)

73

days

Medical knowledge now doubles every 73 days

1:5
K

ratio

Pathologist-to-patient ratio in parts of East Africa

Had Specialist AI (Few roles)



Radiologists — Image recognition for TB, cancer, retinopathy



Pathologists — Tissue analysis, slide screening



Geneticists — Sequence analysis, variant detection



Epidemiologists — Outbreak tracking, disease modelling

No AI Access (Everyone else)

Community Health Workers: Paper-based, no decision support

Nurses & Midwives: Manual triage, handwritten notes

General Clinicians: Hours on documentation, limited tools

Pharmacists: Manual inventory, frequent stockouts

Educators & Faculty: Static curricula, 1:100+ ratios, no adaptive teaching tools

Students: Rote learning, limited case simulation, no AI tutoring, Outdated textbooks

Supply Chain: Last-mile failures, 3+ hour transport

Policymakers: Data gaps, delayed surveillance

But Africa has leapfrogged before. M-Pesa bypassed banks. Blockchain based payments are bypassing traditional payment rails. Telemedicine reached communities without clinics. 170+ leaders from 14 countries convened in Kigali (2025) on AI and health. DeepSeek usage in Africa is already 2–4x higher than other regions.

What Is — Generalist AI Has Arrived

AI that can communicate, adapt, and help **many across healthcare value chain.**

Specialist AI (What Was)

- One task, one domain, one user
- Needed technical expertise to operate
- Expensive, siloed, institution-dependent
- Reached ~5–10% of the healthcare team

Generalist AI (What Is)

- Communicates in natural language
- Adapts to any role, any workflow
- Open-source options: free, local, sovereign
- Can reach 100% of the healthcare team

The fundamental shift: Specialist AI needed you to be technical. Generalist AI meets you where you are — in your language, in your workflow, at your level. It's the difference between a tool for experts and a colleague for everyone.

The generalist AI platforms:

ChatGPT

OpenAI

Claude

Anthropic

Gemini

Google

DeepSeek

China

Mistral

France

Qwen

Alibaba



The First Workforce: Human

- Clinical judgement and empathy
- Lived experiences and reasoning skills
- Accountability and ethical reasoning
- Contextual understanding of patients
- Limited by time, fatigue, and volume



The Second Workforce: AI Agents

- Executes workflows end-to-end
- Information processing at superhuman speed
- No fatigue, infinitely scalable
- No empathy, no accountability, sometimes wrong
- Needs monitoring and management

The critical insight: AI agents don't just assist tasks — they execute workflows. They write clinical notes, analyse imaging, draft research, triage patients, and run operations. They are a workforce, a talent, and not a feature – To collaborate, you need to train professionals with a different competency

Adding AI to a unrefined system doesn't produce a more productive system. You get faster and more expensive chaos.

The Global AI Landscape

A tri-polar world: US leads breakthroughs, China dominates cost-efficient scaling, Europe sets ethical rules

ChatGPT

Proprietary

OpenAI (US)

Most widely used. Strong at explaining complex medical concepts. 98% on USMLE Step 3.

Claude

Proprietary

Anthropic (US)

Enterprise safety focus. Detailed reasoning. Strong compliance and data handling.

Gemini

Proprietary

Google (US)

Med-Gemini: 91.1% on medical benchmarks. Deep Google ecosystem integration.

DeepSeek

Open Source

DeepSeek (China)

Open-source, MIT license. Matches GPT-4 in clinical benchmarks. 2–4x higher Africa usage. Already in Chinese tertiary hospitals.

Mistral

Open Source

Mistral AI (France)

European 'sovereign AI.' Runs on your hardware, under your laws. Strong for privacy-first healthcare.

Qwen

Open Source

Alibaba (China)

480B-parameter open model. Apache 2.0 license. 30% of global open-source AI usage by early 2025.

For Africa: Open-source models can be deployed locally, fine-tuned on African medical data, and run without sending patient data to foreign servers. This changes the equation entirely.

Africa's Global AI Partnerships

Not waiting — It is actively participating to build AI. Major global AI companies are partnering directly with African governments and institutions.

CLINICAL AI

OpenAI + Gates Foundation

\$50M Horizon1000 initiative. AI for 1,000 primary clinics by 2028. Starting in Rwanda. Frontline health workers get clinical decision support, triage, record-keeping. Training health workers with curriculum, assessment, supervision tools

HEALTH + EDUCATION

Anthropic + Rwanda

First multi-sector government MoU in Africa. AI for health (eliminating cervical cancer, reducing malaria), education (2,000 Claude Pro licenses for educators, AI learning companion across 8 countries), and public sector.

TB + MATERNAL

Google Health + Africa

100,000 free AI-powered TB screenings across sub-Saharan Africa. Maternal health AI with Jacaranda Health in Kenya. Emergency obstetric care AI in Nigeria. MedGemma open-source model.

INFRASTRUCTURE

Huawei + Angola

R&D centre by 2027. Training 7,000 talents in AI and connectivity. Sovereign AI cloud infrastructure. Pangu models across 500+ healthcare scenarios.

OPEN SOURCE

DeepSeek (Open Source)

MIT licence. Matches proprietary models in clinical benchmarks. 2–4x higher usage in Africa than other regions. Can be deployed locally, fine-tuned on African data, under African jurisdiction.

Governance: AU Continental AI Strategy (2024–2030) | Kenya National AI Strategy (2025–2030) | Rwanda Vision 2050 | South Africa AI Institute

Generalist AI Reaches Many Roles

Shift from Tools to Talent

What specialist AI couldn't do — generalist AI can. Real deployments across Africa's full healthcare value chain.

COMMUNITY
HEALTH

Ubenytics (Kenya)

Malaria diagnosis in 90 seconds, 98.5% accuracy, 420+ facilities

CLINICIANS

Ubenwa (Nigeria)

Machine Learning analyses infant cry patterns to detect birth asphyxia within minutes

SPECIALISTS

Chestify AI (Ghana)

AI TB X-ray reading, 25 facilities, 40% faster where no radiologist exists

PHARMACISTS

mPharma (Ghana)

AI inventory management: 45% drop in stockouts, 37% cost reduction

SUPPLY CHAIN

Zipline (Rwanda)

Drone delivery to 84% of hospitals, 3 hours → 15 minutes, \$150M expansion

EDUCATORS

Anthropic + Rwanda

2,000 Claude Pro licences for educators, AI companion across 8 countries

FRONTLINE

Horizon1000 (Rwanda)

OpenAI + Gates: AI for 1,000 clinics, decision support, triage, multilingual

What Could Be — The Hybrid System

The future is not choosing between tools or platforms. An African hybrid health system where, specialist AI, generalist AI, and human professionals work side by side.



Specialist AI

Deep expertise

- Reads imaging with 94%+ accuracy
- Analyses genomic sequences
- Detects patterns in pathology
- Predicts disease outbreaks



Generalist AI

Broad reach

- Writes clinical notes in seconds
- Creates adaptive curricula
- Manages inventory and supply
- Supports any role, any language



Human Professionals

Judgement + empathy

- Clinical decision-making
- Ethical reasoning and accountability
- Patient relationships and trust
- Teaching, mentoring, leading

The vision: Every health worker has AI support. Every student has an AI tutor. Every institution controls its own data. Every patient benefits.

Where to Start: Practical Applications for Africa

Concrete ways AI can serve African health systems today — across four domains. All grounded in what's already working or is feasible (Not comprehensive)

Clinical Practice

AI Triage

Prioritise patients in high-volume outpatient clinics. Reduce 4-hour waits.

Multilingual History

Patient intake in 200+ African languages. Voice-to-structured-data.

Diagnostic Support

AI flags TB, malaria, cervical cancer where no specialist exists.

Drug Interactions

Real-time checking for HIV/TB/NCDs polypharmacy — common in Africa.



Health Education

AI Tutors

Adaptive learning for each student. Socratic questioning in local languages.

Case Generation

Clinical vignettes using African disease profiles, not US/EU defaults.

Virtual Simulation

AI-powered clinical scenarios without expensive simulation labs.

Faculty Support

Curriculum design, assessment creation, feedback at scale for 1:100+ ratios.



Public Health

Community Health Worker Decision Tools

Malaria, maternal health, nutrition protocols for community workers.

Outbreak Prediction

Early warning from syndromic surveillance, climate, and mobility data.

Health Literacy

AI-generated campaigns in local languages, culturally adapted.

Mental Health

AI companions where no psychologist exists. Prevention-first (SoZoAi).



System Operations

Supply Chain

Predict stockouts before they happen. Optimise last-mile delivery.

Patient Flow

Bed management, discharge planning, referral coordination.

Workforce Planning

AI-assisted scheduling, skill-gap analysis, training allocation.

Policy Dashboards

Real-time data for evidence-based decisions. End delayed surveillance.

Designing the Operating Model

It's not about who has more AI. It's about who has designed the right operating model for a hybrid world.



01 Govern Well

Build the rules before you scale the tools

Establish institutional AI policies. Follow the AU AI Strategy 2024–2030. Define what data enters AI, which decisions need human sign-off, how outputs are audited.



02 Hire for Judgement

The human skill that becomes more valuable

Train professionals and students to evaluate AI critically. When knowledge doubles every 73 days, judgement — not recall — becomes the premium skill. Enhanced clinical reasoning skills, when AI handles the information processing



03 Get Specific

Map every role: which AI, which task, which guardrails

For each role, decide: where does specialist AI execute? Where does generalist AI assist? Where must humans lead? A dean designing curriculum differs from a clinician reading scans.



04 Design for Equity

Open-source is Africa's strategic advantage

Deploy models locally. Fine-tune on African data, languages, and disease profiles. Ensure connectivity-limited environments — rural clinics and training sites — are included.

What to Watch Out For



Hallucinations

AI produces confident, well-structured answers that are factually wrong. Generalist AI is especially prone to this. **Every clinical output requires human verification.**



Data Sovereignty

Proprietary models send data to US/China servers. **Open-source deployed locally keeps it under your jurisdiction.** Know where your data goes.



Algorithmic Bias

Models trained on high-income country data may miss conditions prevalent in African populations. **Fine-tuning on African data is essential, not optional.**



Clinical Deskilling

When generalist AI handles everything, the risk of deskilling grows. **Design for augmentation, not replacement.** Protect the reasoning that defines expertise.



Digital Colonisation

Who builds the tools and workflows? Whose data trains them? Ubenytics, Ubenwa, Chestify AI show Africa can build its own. **Be a contributor, not just a consumer.**

The Collapse of Average

The second workforce and the collapse of average aren't separate trends — they're the same trend. AI agents amplify whoever is holding them well.

Institutions that design well:

Clean governance + trained faculty + specific AI deployment mapped to value chain= compounding advantage

Institutions that don't:

No governance + untrained faculty + vague AI adoption = faster chaos, wider gaps

What I Hope You Take Away

THE SHIFT

We've moved from **specialist AI that helped a few to generalist AI that can help everyone**. The nurse, the educator, the community health worker, the student now have access to AI for the first time.

REFRAME

AI is not a tool. It's a talent to manage, second workforce operating across your entire value chain — from community health workers to policymakers. Design for two workforces.

DESIGN, INNOVATE

It's not about who has more AI. Govern well, hire for judgement, get specific about which AI for which role, and design for equity using open-source.

ACT NOW

The gap between designed institutions and reactive ones' compounds. Map your value chain. Identify where each type of AI can serve. Start thinking and building your hybrid system today — the future is **specialist AI + generalist AI + human professionals working together**.



Thank You

*From specialist AI that helped a few,
to generalist AI that helps everyone,
to the hybrid system Africa can design.*

Vamshi Lingampally, Cofounder [SoZoAi](#)