

INNOVATION AT THE VILLAGE CLINICS

How can AI democratise rural healthcare in Bangladesh?

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In the near future, perhaps in a tin-roofed clinic in Kurigram, a 28-year-old health worker named Salma Begum might press a smartphone against a coughing toddler's chest. The device's screen could flicker, then display a message in Bangla:

"mæCve'wbD#gjwbqy(Possiblepneumonia detected). Seek care immediately."

She exhales in relief. There isn't a doctor for miles—the nearest physician is two hours away by bus—but this tiny Artificial Intelligence (AI)-assisted tool might just save the boy's life. Salma gently instructs the boy's mother to begin the journey to the district hospital.

A decade ago, Salma would have had to guess the child's illness. In this imagined future, an algorithm on her phone listens to the raspy breathing and guides her next steps.

This isn't happening yet—but it could. Salma's story represents the promise of a technology-led future where artificial intelligence becomes the new village health assistant, filling gaps in a rural healthcare system long in distress. Before exploring how such a transformation might unfold, we must first understand the scale of the challenge.

The scale of the problem — Numbers behind the crisis

Bangladesh's healthcare gap is daunting. The World Health



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A community health worker is measuring a baby as the mother is watching with a smile in a rural village. Such frontline workers form the backbone of Bangladesh's primary healthcare system — a system that, with the help of AI in the future, could reach even the most remote corners with timely diagnosis and care.

within seconds – crucial in a country with high TB rates and few radiologists. Studies show an AI system can identify TB on chest X-rays as accurately as an expert doctor. In practice, this means a community health worker could upload an X-ray via an app and get an instant result, instead of waiting days for a distant radiologist.

Pocket ultrasounds and smart sensors

Another breakthrough is portable AI-powered ultrasound. Not long ago, ultrasound machines were bulky and required a trained sonographer. Now, companies have developed handheld ultrasounds that pair with smartphones. In 2025, Bangladesh became the first country in Asia to adopt a portable AI-ultrasound device. "This device is designed to be portable and highly efficient, making high-quality diagnostics more accessible, even in remote areas. Doctors and nurses will soon use it like a stethoscope," said Yusuf Haque, the Bangladeshi-origin co-founder of the US company behind it. With such a tool, a midwife in a village can scan an expectant mother's belly and get an AI-guided reading – is the baby positioned correctly, is there distress – on the spot. Similarly, a health worker could detect heart abnormalities or organ issues using a handheld ultrasound probe in the field – something unimaginable a few years ago.

Smartphone apps and AI assistants

AI is also helping with everyday triage and decision support. AI-driven apps can analyse symptoms and vital signs to assist health workers. For example, a health worker might record a patient's cough or input symptoms in Bangla, and an algorithm will suggest likely causes and whether the case is urgent. Such apps, essentially an AI-driven checklist, can flag warning signs (say, if several dengue symptoms appear) and advise on next steps.

Fighting blindness and chronic disease

AI is tackling slower killers too. Diabetes is on the rise in Bangladesh, and a serious complication is diabetic retinopathy – which can cause blindness if not caught early. But eye specialists are rare outside big cities. Enter AI: Google has developed a system that analyses retinal photos to detect signs of diabetic eye disease. Thailand and India have already used such AI to screen hundreds of thousands of patients, and Bangladesh could follow suit by equipping diabetes clinics with automated eye-screening cameras. In trials, the AI was able to catch eye damage early, allowing patients to get treatment before losing vision.

A day in the life — Humanising the technology

How might this technological transformation feel on the ground? Let us return to the imagined day at Salma Begum's clinic.

Before she had AI tools, Salma's routine would have involved basic triage. With only a few weeks of formal training, she spent her days treating fevers, bandaging wounds,

and referring serious cases to distant hospitals. If a patient came in wheezing and short of breath, she had to make a judgement call—was it a common cold, asthma, or life-threatening pneumonia? Out of caution, she often referred them all. Many families, unable to afford transport, delayed seeking care.

In the imagined future, Salma's day looks different. Each morning, she checks a health dashboard on her tablet for alerts from nearby villages. When she opens the clinic, patients are already waiting on benches. She uses a tablet-based system that guides her through symptom checklists and flags danger signs. If a baby arrives with high fever and rash, Salma answers on-screen questions and the system suggests measles—prompting her to alert the district health office.

She still keeps handwritten notes, but now also enters patient data into

trust these new methods.

Data and bias: Another issue is data quality and bias. If an AI is trained mostly on foreign or urban hospital data, it might misdiagnose rural Bangladeshi patients. Indeed, the WHO has cautioned that AI tools could be "dangerous" in lower-income countries if not properly adapted. For example, an algorithm that works well in Europe might falter on a Bangladeshi population due to different genetics, diets, or disease patterns. Data privacy is also a concern; as health records go digital, strong safeguards will be needed to protect patient information.

Cost and sustainability: Finally, there's cost. Many of these technologies are expensive to deploy at first. A portable ultrasound or diagnostic AI subscription might be beyond the budget of a rural clinic. Scaling up AI will require strategic investment. The government and development partners

have offline modes. For example, a community clinic in a remote char area should be able to use an AI diagnostic app without needing 4G – the app can store data locally and sync when it gets a signal. Embracing this kind of "edge AI" (where computation happens on local devices) will ensure no village is left behind due to connectivity issues.

Integrate into primary care: AI tools should be woven into existing public health programmes, not operate in isolation. The vast network of community clinics is a ready platform. Imagine each of the 18,000 planned clinics equipped with a standard digital kit: a tablet loaded with diagnostic software in Bangla, a few portable devices (such as an AI-supported ultrasound and a digital stethoscope), and basic training for the health provider. These clinics already serve as the first contact for rural patients; with AI support, they can resolve more cases on-site and make smarter referrals for severe cases. Integration also means connecting the data – linking clinic systems with upazila hospitals and national dashboards – so information flows seamlessly.

Public-private partnerships: Scaling AI in healthcare will require funds and expertise. The government can partner with private telecom and tech companies to sponsor telehealth and AI initiatives. (For instance, mobile operators might provide free data for clinic connectivity, or local start-ups could receive grants to develop Bangla-language health apps.) Bangladesh's development partners (UN agencies and donor countries) are also keen to support digital health as part of achieving universal health coverage. By setting clear national guidelines on digital health – covering data privacy, quality control, and liability – the government can encourage innovation while protecting patients.

A human touch in a digital future

As the imagined sun sets over Kurigram, Salma receives a message on her phone: the little boy with pneumonia has reached the hospital in time and is recovering. She smiles, relieved. Not long ago, that child's fate might have been different.

Technology doesn't replace Salma—it empowers her. Bangladesh's healthcare future will not be about robots replacing doctors, but about people and technology working together. We may never have a doctor in every village, but perhaps we can have digital tools in every clinic—bringing a doctor's guidance to every doorstep.

If implemented wisely, AI could help Bangladesh achieve something transformative: ensuring that whether you live in a Dhaka apartment or on a remote river island, you have an equal chance to live a healthy life. It is a future where the village health worker and the AI platform form a team—offering millions of Bangladeshis hope that quality healthcare is, at last, within reach.

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To truly harness AI's potential, Bangladesh will need to localise and scale these innovations across the country.

Imagine a future where a tablet or phone in a village clinic can perform the work of expensive lab tests and specialists. That future is starting now. Artificial intelligence, often associated with self-driving cars or chatbots, is being applied in Bangladesh and similar countries to deliver healthcare in revolutionary ways.

Organization recommends about 23 doctors per 10,000 people, but Bangladesh has only around seven doctors per 10,000 citizens. In practical terms, that's roughly one doctor for every 1,400 people – four times worse than in many developed countries. Nurses are even scarcer: there are only about 0.6 registered nurses per 1,000 people. In some rural upazilas, a single doctor oversees tens of thousands of residents. Most medical professionals cluster in cities, leaving villages chronically underserved. (In 2006, about 35% of Bangladesh's doctors were working in just four major cities, where less than 20% of the population lived.)

This imbalance means rural families often travel long distances or rely on unlicensed "village doctors" for care. The strain on the system is evident. Patients crowd the corridors of district hospitals; many end up lying on floors for lack of beds. Preventable illnesses go untreated until they become serious. And Bangladesh shoulders an extra burden in places like Cox's Bazar, home to the world's largest refugee camp.

These realities set the stage for why innovators are turning to technology. Can AI help bridge this gap? Can machines extend the reach of the few doctors and nurses on the front line? Bangladesh is beginning to find out.

The promise of AI — Machines as the new village medics

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Digital diagnostics

One promising area is AI-powered medical imaging. For example, AI algorithms can read chest X-rays to detect tuberculosis or pneumonia



ILLUSTRATION: STAR

an app. That data travels faster than the illness. If several patients in her area show similar symptoms, health officials in Dhaka can see the pattern in real time.

For villagers, the change is visible. They see their daktar apa now has more tools. Trust in the clinic grows. It is no longer just a place for Panadol and bandages—it is a gateway to higher care. When Salma refers someone, families know it is truly necessary.

The barriers — Data, trust, and the digital divide

If AI in healthcare is so promising, why isn't it everywhere yet? The reality is that several hurdles stand in the way of scaling these solutions in Bangladesh.

Infrastructure: Patchy electricity and internet in villages mean high-tech solutions must be robust. As of 2024, only 36.5% of rural individuals use the internet, compared to 71.4% in urban areas. Connectivity cannot be assumed. Any AI tool must work offline or on low bandwidth, with backups (such as solar power in clinics) to keep devices running during outages.

Training and trust: The aim of AI is to assist, not replace, health workers – but this must be clearly communicated. Many staff need training to use new devices confidently. Patients, too, will need reassurance and education to

may need to subsidise critical devices or provide financial incentives for tech companies to focus on public health needs.

The future vision — Making AI truly Bangladeshi

To truly harness AI's potential, Bangladesh will need to localise and scale these innovations across the country:

Develop local data & talent: Building Bangladeshi health datasets (from our hospitals, clinics, and research institutions) is crucial so that AI models can be trained on local realities – from disease prevalence to Bangla-language nuances. Universities and tech start-ups can collaborate on this, ensuring algorithms know how a Bangladeshi patient might present symptoms, not just a Western patient. At the same time, we should cultivate local expertise: encourage young engineers and doctors to work on AI for health. Medical and nursing curricula can introduce basic digital health training, so the next generation of providers are comfortable using AI tools alongside stethoscopes.

Ensure connectivity & offline access: The government must improve rural internet and power infrastructure for digital health to thrive. Until then, new healthcare apps should