



In many cases, the machines are taken directly into communities, set up in trading centres, health camps, or rural facilities where access to advanced diagnostics was once limited. PHOTO/COURTESY.

# Uganda turns to AI for earlier TB diagnosis

From remote villages to regional hospitals, artificial intelligence is transforming how Tuberculosis is detected in Uganda, helping health workers spot cases sooner, start treatment faster, and close a dangerous gap in diagnosis.

BY GEOFFREY OYET OKWERA

When James Draku from Yumbe District developed a persistent cough, he assumed it was something ordinary. It lingered for weeks, refusing to respond to simple remedies. But when he finally sought medical attention, the diagnosis was clear: tuberculosis.

At Arua Regional Referral Hospital, Draku underwent a chest X-ray supported by artificial intelligence. Within minutes, health workers had a clearer picture of what they were dealing with, allowing them to quickly place him on the right treatment plan.

"I did not know it was TB," he says. "But now I am getting help early."

Draku's story is not unique, but his early diagnosis is.

Across Uganda, thousands of people with tuberculosis remain undiagnosed, often mistaking the disease for a stubborn cough. For others, distance, cost, or fear delays the decision to seek care.

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**Impact. Artificial intelligence is helping us close one of the biggest gaps in tuberculosis control—late diagnosis. By analysing chest X-rays quickly and accurately, these systems are enabling health workers to identify suspected cases much earlier than before, especially in areas where specialists are not available. This means patients can be tested, confirmed, and started on treatment faster, reducing transmission in the community, says Dr Henry Luzze, National TB and Leprosy Programme, Uganda**

Joseph Acidri knows this too well. He initially chose to self-medicate when his cough persisted. By the time he visited Jinja Hospital, his condition had worsened. He was eventually diagnosed with tuberculosis and enrolled on treatment, but only after weeks of uncertainty.

Stories such as these highlight a persistent challenge: finding TB cases early enough to stop the disease from spreading.

## A quiet shift in detection

In recent years, Uganda has begun deploying AI-powered digital X-ray units, particularly in underserved and hard-to-reach communities. These portable machines use computer-aided detection software to automatically analyse chest images and flag abnormalities linked to TB.

In places where radiologists are scarce, the technology is proving transformative.

Instead of waiting days or even weeks for expert interpretation, frontline health workers can now identify suspected TB cases on the spot and refer patients for confirmatory testing almost immediately.

Between 2021 and 2025, AI-supported systems screened more than 190,000 people across the country. Nearly 30 percent showed abnormalities, leading to about 6,000 confirmed TB diagnoses after further testing.

Behind these numbers are lives that might otherwise have been missed.

## Bringing diagnosis closer

Uganda currently has 95 mobile dig-

## KNOW THE SIGNS

- A cough lasting two weeks or more. Chest pain or discomfort when breathing or coughing.
- Difficulty breathing. Coughing up blood or blood-stained sputum.
- Unexplained weight loss.
- Persistent fever. Night sweats. Ongoing fatigue or weakness that does not improve with rest.

## Why early testing matters

- TB spreads easily through the air when an infected person coughs or sneezes.
- Early testing helps protect family, friends, and the community.
- TB is treatable and curable when detected early.

ther testing and treatment much earlier. The impact is especially significant in high-burden areas, where delayed diagnosis has long fuelled transmission.

## The scale of the challenge

Despite these gains, tuberculosis remains a major public health threat in Uganda. An estimated 96,000 people develop the disease each year, yet about 30,000 cases go undiagnosed or unreported.

This gap allows the disease to spread silently within communities.

In 2024 alone, around 88,000 cases were officially registered, against an estimated 99,000 infections. The difference represents thousands of people living, unknowingly, passing on the disease.

Health experts say the reasons are complex: long travel distances to health facilities, stigma, low awareness, and limited diagnostic capacity at lower-level centres.

## Technology meets community care

While AI is improving screening, experts caution that it is only part of the solution. Dr Kasonde Mwinga, the World Health Organisation Country Representative in Uganda, emphasises the need for integrated approaches that combine technology with community-based care.

In 2024, integrated outreach programmes reached more than 1.2 million people with TB, HIV, and malaria services. Thousands of TB cases were identified through these efforts, alongside other critical health interventions.

The approach recognises that diseases do not exist in isolation and neither should their solutions.

At the same time, Uganda's digital transformation in healthcare is expanding beyond diagnostics. Tools such as electronic medical records and community health information systems are improving how patient data is captured, tracked, and used to guide decisions.

Together, these innovations are helping build a more responsive and connected health system.

## The road ahead

Uganda's National TB and Leprosy Strategic Plan (2020 to 2025) places strong emphasis on decentralising services, ensuring that screening, diagnosis, and treatment are available closer to where people live.

Dr Diana Atwine, the Permanent Secretary at the Ministry of Health, says expanding access to diagnostic services is critical.

"When testing is brought closer to communities, people are diagnosed earlier and start treatment sooner," she explains. "This not only saves lives but also reduces transmission."

Still, challenges remain. Drug-resistant TB, gaps in access to care, and delayed health-seeking behaviour continue to slow progress.

And while AI-powered imaging is accelerating detection, it cannot work in isolation. Diagnosis must be linked to treatment, follow-up, and sustained community engagement.

## Finding cases before they spread

Back in Yumbe, James Draku is now on treatment, a step that came sooner than it might have just a few years ago.

His diagnosis is part of a broader shift taking place across Uganda, where technology is quietly changing how tuberculosis is found and fought.

For a disease that spreads easily and often hides in plain sight, timing is everything. And with the help of artificial intelligence, Uganda is beginning to find cases not just faster, but earlier, when it matters most.