COMBAT DR-TB

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Innovation Isn't Enough: Why TB Technology Must Be Matched with Systems Change

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Tuberculosis (TB) remains one of the world's deadliest infectious diseases despite being both preventable and curable. In 2023 alone, over 10 million people developed TB, yet millions were never diagnosed or treated. These are often referred to as the *"missing cases"* which refers to individuals who either never access diagnostic services or experience significant delays in getting a diagnosis.

For many people, the challenge is not just the disease itself, but the systems meant to detect it.

This is where near point-of-care (NPOC) testing becomes increasingly relevant.

NPOC diagnostic tools are designed to be performed close to the patient, at local clinics or peripheral health facilities, rather than centralized laboratories. Unlike conventional lab-based testing, which can take days or weeks due to sample transport and processing delays, NPOC tests can deliver results within minutes to hours. In theory, this should reduce diagnostic delays, minimize loss to follow-up, and enable earlier treatment initiation.

I had the opportunity to participate in a community dialogue convened by *Nairobi County TB Champions* on 30th April 2026 at Bethlehem Community Centre in Embakasi West. The dialogue convened under the Unitaid-funded, *Combat DR-TB project,* brought together patients, healthcare workers, county officials, and advocates to identify gaps across the TB care cascade and strengthen community–health system collaboration.

The discussions highlighted a critical reality: diagnostics, no matter how innovative, do not operate in isolation from the health system around them.

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TB care is a pathway, not a single test

TB care spans multiple stages: from initial suspicion, to diagnosis, drug resistance testing, treatment initiation, monitoring, and prevention of infection. At each stage, different tools are used, each with their own strengths and limitations.

Screening often begins with symptom-based assessment including looking for persistent cough, fever, weight loss, or night sweats. While low-cost and easy to implement, symptom screening misses a significant proportion of cases.

Chest X-rays can improve detection and, increasingly, computer-aided detection (CAD) technologies are being used to support interpretation in settings with limited radiology expertise. However, imaging alone cannot confirm TB and may flag individuals without the disease.

Diagnosis then requires bacteriological confirmation through tests such as nucleic acid amplification tests (NAATs), including rapid molecular platforms, or urine-based lateral flow assays like LAM in specific high-risk groups. Culture remains the gold standard but is slow, often taking weeks.

If TB is confirmed, drug resistance testing becomes critical. Rapid molecular diagnostics can identify resistance to key drugs such as rifampicin, while more advanced testing methods help guide treatment for drug-resistant TB.

Near point-of-care diagnostics offer a practical solution, bringing testing closer to patients, reducing delays, and enabling faster, more effective care across the TB pathway.

What community dialogue reveals that data alone cannot

At the *Nairobi County DR-TB Community Dialogue*, these system gaps were not abstract, they were lived realities shared directly by patients and healthcare workers.

Participants highlighted delays in diagnosis, limited access to drug resistance testing, stockouts of TB Preventive Therapy (TPT), and weak follow-up systems that compromise adherence and continuity of care. There were also powerful reminders of how stigma continues to shape TB experiences in both community and healthcare settings.

Just as importantly, the dialogue surfaced misconceptions that continue to influence health-seeking behaviour and treatment outcomes:

- *"TB is only a disease of the poor"*
- *"TB is inherited within families"*
- *"TB can be spread through shared utensils"*
- *"Once symptoms improve, treatment can be stopped"*

Each of these beliefs carries real consequences, from delayed care-seeking to poor treatment adherence and reduced uptake of preventive therapy among household contacts.

These insights underscore a critical point: **even the best diagnostic tools cannot achieve impact in the presence of misinformation, stigma, and weak health system support.**

Where innovation fits and where it falls short

Near point-of-care testing, along with innovations such as CAD-enabled chest X-rays and rapid molecular diagnostics, represents an important step forward. These tools can bring testing closer to patients, reduce turnaround times, and improve early detection.

But their effectiveness depends on the systems in which they are embedded. **This includes the availability of trained healthcare workers, reliable supply chains, effective referral pathways, and patient follow-up mechanisms that ensure individuals are not lost along the care cascade.**

Without these foundational elements, even the most advanced diagnostic tools will fail to reach their full potential.

A systems problem, not just a technical one

In March 2026, the WHO introduced updated guidance aimed at making TB diagnostics faster, more affordable, and more accessible. As WHO Director-General Dr. Tedros Adhanom Ghebreyesus noted, these tools "could be truly transformative for TB by bringing fast, accurate diagnosis closer to the people, saving lives, curbing transmission, and reducing costs."

In countries like Kenya, ranked among the top 20 high TB burden countries globally, these recommendations are especially relevant. Yet they arrive at a time when nearly 30% of TB cases are still undetected, and domestic and donor funding pressures threaten the stability of TB programs.

This raises an important question: **how do we ensure that innovation translates into impact?**

Conclusion

TB is not a failure of diagnostics alone, it is a reflection of broader system weaknesses.

Near point-of-care testing, molecular diagnostics, and AI-assisted imaging all hold enormous promise. But without addressing the underlying challenges of access, equity, human rights, supply chains, and patient support systems, their impact will remain limited.

Ultimately, ending TB will require more than better tools. It will require stronger systems that ensure those tools actually reach the people who need them, and are used effectively once they do.

Innovation matters. But it is our systems that determine impact.