



AI4D

Helping identify Tuberculosis in people with HIV in Tanzania

The Hidden Health Threat

- Screening high-risk groups is crucial for eliminating tuberculosis (TB).
- Due to the shortage of diagnosticians, the WHO recommended the use of AI with chest X-rays to help diagnose TB.
- However, one of the groups at highest risk, people living with HIV (PLHIV), presents a diagnostic challenge: their chest X-rays have different features.

"The other challenge... was to get [consent from] people living with HIV. Many people here tend to hide their condition. They don't want everyone to know."

Dr. Deogratias Mzurikwao



An Innovative Solution



An AI algorithm that uses deep learning to detect specific TB markers on chest X-rays from PLHIV.

The Story

Dr. Deogratias Mzurikwao heads Muhimbili University's research and development lab for emerging healthcare technologies in Tanzania. Using deep learning, his team developed an algorithm for detecting TB on chest X-rays.

But the team also wanted to identify the specific TB characteristics of people living with HIV, thus ensuring this particularly vulnerable group would receive special attention. So they trained the algorithm on data specific to people with HIV, driving their van all over the country to persuade people with HIV to share their health records.

The Result

- The algorithm has a success rate of over 90% in laboratory trials, and has been formulated to train health workers by showing process.

"Our model showed us the features which [it] was focusing on when it makes the decision"

Dr. Deogratias Mzurikwao

- The team is now working with Tanzania's official tuberculosis program to get the model validated for national screenings.

Learning

Tanzania is short of diagnosticians, including radiologists and radiographers. However, the team found healthworkers were often uncomfortable with AI, afraid it might substitute for human responsibility. The team helped to address these fears by involving healthworkers all through, showing that AI would support their work rather than replacing it.

"There are people in healthcare that... resist when it comes to artificial intelligence... Involving them from the very early stages helped us a lot. They started trusting the process."

Dr. Deogratias Mzurikwao

Community Engagement

To ensure the project was ethically sound and locally relevant, the team:

- worked closely throughout with local health authorities and the National Tuberculosis Program of Tanzania;
- visited clinics throughout the country to identify HIV patients willing to share their data for the trial, as well as ensuring strong regional representation;
- "We need to see this in the community, being used to screen people with HIV," says Dr. Deogratias Mzurikwao

User Story

Dr Lulu Sakafu, says,

"AI will make our job easier. Instead of me looking at 50 X-rays in a day, we (will) do about 80 X-rays in a day. Then I'll have maybe 20 X-rays to concentrate and the 60 will be taken care of with AI... I (will) have more concentration on my few X-rays rather than right now... sometimes you get fatigue."

Moving Forward

The team is further seeking support that will help them to:

- Run clinical trials in four sites in Tanzania. Seek regulatory approval following clinical validation.
- Deploy the model in Tanzanian settings.
- Explore taking the model to other African countries.

LEARN MORE

- AI4D: <https://www.ai4d.ai>
- HASH: <https://hash.theacademy.co.ug>
- University of Muhimbili: muhas.ac.tz
- The Global Health Network: <https://ai-globalhealthresearch.tghn.org/>