

ACCELERATING DIAGNOSIS IN RESIDENTS OF INFORMAL SETTLEMENTS USING ARTIFICIAL INTELLIGENCE

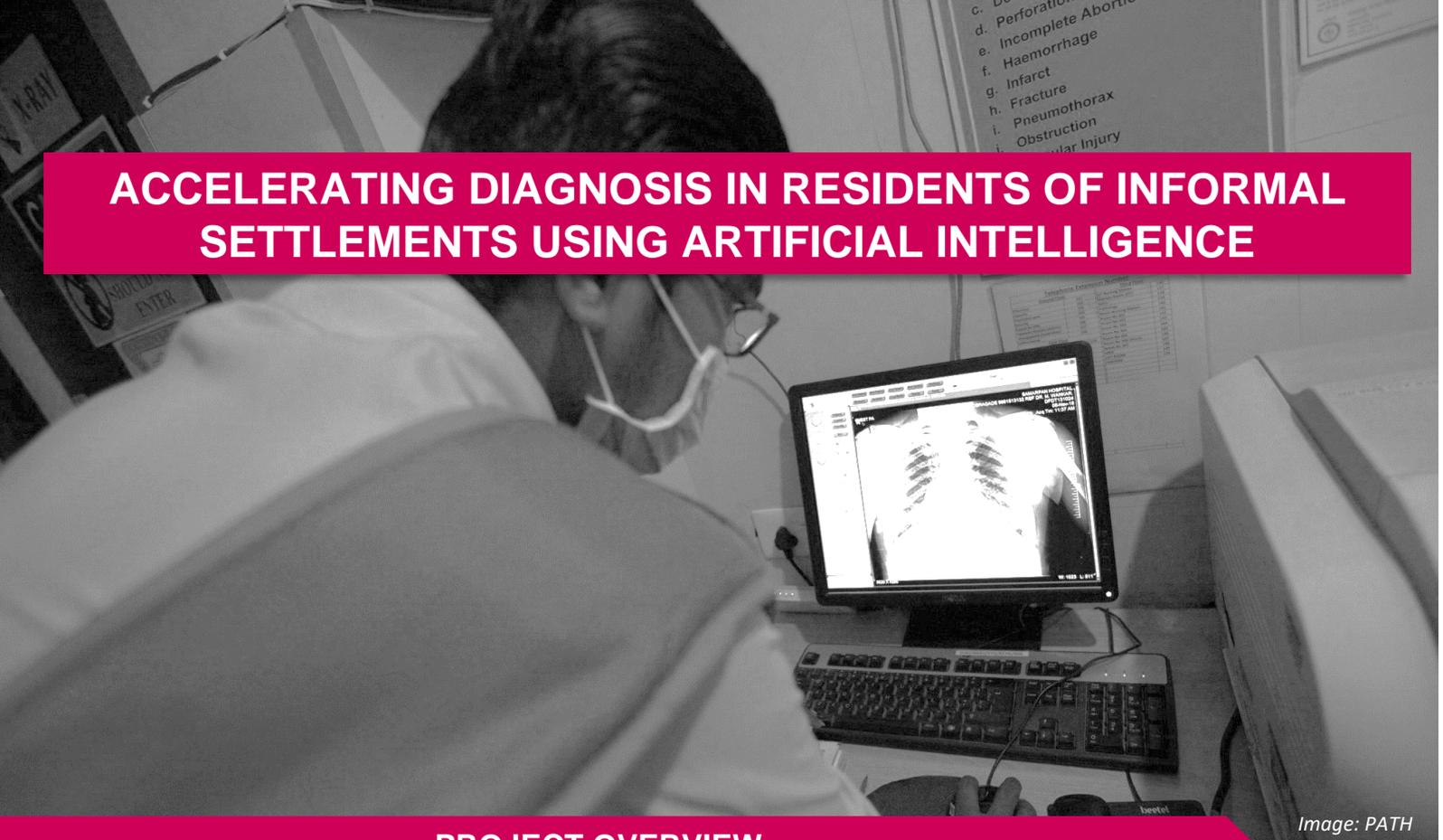


Image: PATH

PROJECT OVERVIEW



Nagpur, India



January 2019-
February 2020



qXR (Qure.ai)



PATH India

AI INTERVENTION

India has the highest tuberculosis (TB) burden in the world and Nagpur, a densely populated Indian city that is home to roughly three million people, has one of the highest TB burdens in the country.^{1,2} An estimated 36% of them live in informal settlements, where the most accessible and affordable health care is often from informal providers who lack a medical license and are very rarely able to use advanced diagnostic tools.³ The consequence for people with TB is a **slow and costly diagnostic process**. Against this backdrop, Stop TB Partnership's TB REACH initiative supported the introduction of a **package of cutting-edge TB screening and diagnostic technologies** from Indian innovators to accelerate the diagnosis of residents of informal settlements.

Free digital X-rays were provided to people with a cough attending private health facilities engaged by the project. The X-ray was then **read automatically by artificial intelligence (AI)** as well as radiologists. If the AI tool (qXR) indicated that a chest X-ray was suggestive of TB, health care workers received an SMS message reminding them to contact the person and offer them a state-of-the-art diagnostic test (Truenat). Anyone diagnosed with TB was treated at government facilities.

Running from January 2019 to February 2020, the project resulted in a **noticeable increase in the number of TB cases detected** demonstrating the combined effectiveness of the new screening and diagnostic tools.

PROJECT IMPACT

- ✓ **10,481** people referred for free chest X-ray read by AI
- ✓ **197** people diagnosed and treated for TB
- ✓ **13% increase** in case detection attributable to AI
- ✓ **50% increase** in number of TB cases notified by the private sector compared to 2018



Project healthcare worker supporting treatment. Photo: PATH India.

PATH worked closely with the local association of radiologists to earn their support, paving the way for the future application of this AI-powered computer assisted detection (CAD) technology – not only in Nagpur, but also in other parts of India that carry a similar burden of disease.

Overall, AI greatly assisted the project in its goal. Among those diagnosed with TB by the project **13% were missed by the human readers but identified by AI**. This demonstrated the huge potential for AI in TB screening, with project managers hoping to use it to screen rural communities that would not otherwise be able to access TB health care. PATH was a strong advocate for the inclusion of AI in India's National Strategic Plan (2020-2025) and it continues to use AI in a number of its projects internationally.

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I THINK AI IS A VERY GOOD TOOL, ESPECIALLY FOR TB. I AM COMPLETELY IN FAVOUR OF USING IT FOR TB DISEASE SCREENING. AFTER THIS EXPERIENCE, AND KNOWING THE EFFECTIVENESS OF AI, I THINK IT COULD REALLY MAKE A DIFFERENCE IN PERI-URBAN AND RURAL AREAS IN INDIA.

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**– VAISHNAVI JONDHALE,
PROJECT OPERATIONS MANAGER, PATH INDIA**



Hemant receiving care from a project health worker. Image: PATH India

Hemant drove an auto for a living to look after his child – the only family he has. One day, he fell ill with TB, and eventually his symptoms meant he could no longer work. After he had received a free chest X-ray which showed signs of disease, he rather hesitantly provided a diagnostic sample for testing. He was diagnosed with TB and jaundice.

Happily, after initiating treatment and following a better diet, Hemant began to feel better, put on weight, and was able to work again, finding a new job to provide for his family.

REFERENCES

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2. *India TB Report 2019 - Revised National TB Control Programme Annual Report*. Accessed December 17, 2021. <https://tbcindia.gov.in/WriteReadData/India%20TB%20Report%202019.pdf>
3. 36% population lives in 446 slums in city | Nagpur News - Times of India. Accessed December 17, 2021. <https://timesofindia.indiatimes.com/city/nagpur/36-population-lives-in-446-slums-in-city/articleshow/9005568.cms>

ABOUT THIS DOCUMENT

This document is one of a series spotlighting the experiences of these early implementers when using artificial intelligence (AI) / computer-aided detection (CAD), to highlight the added value of CAD for TB programmes and inspire prospective implementers to innovate. Funding of this project was provided by the Stop TB Partnership's TB REACH initiative, launched in 2010 by Global Affairs Canada. In 2012, TB REACH first worked with implementing partners to pilot CAD software. Since then, it has implemented 3 different CAD products in 13 different countries in Sub-Saharan Africa, Latin America, Eastern Europe, and South and South-East Asia.

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