DEPLOYING ARTIFICIAL INTELLIGENCE FOR TB SCREENING FOR THE FIRST TIME IN NEPAL

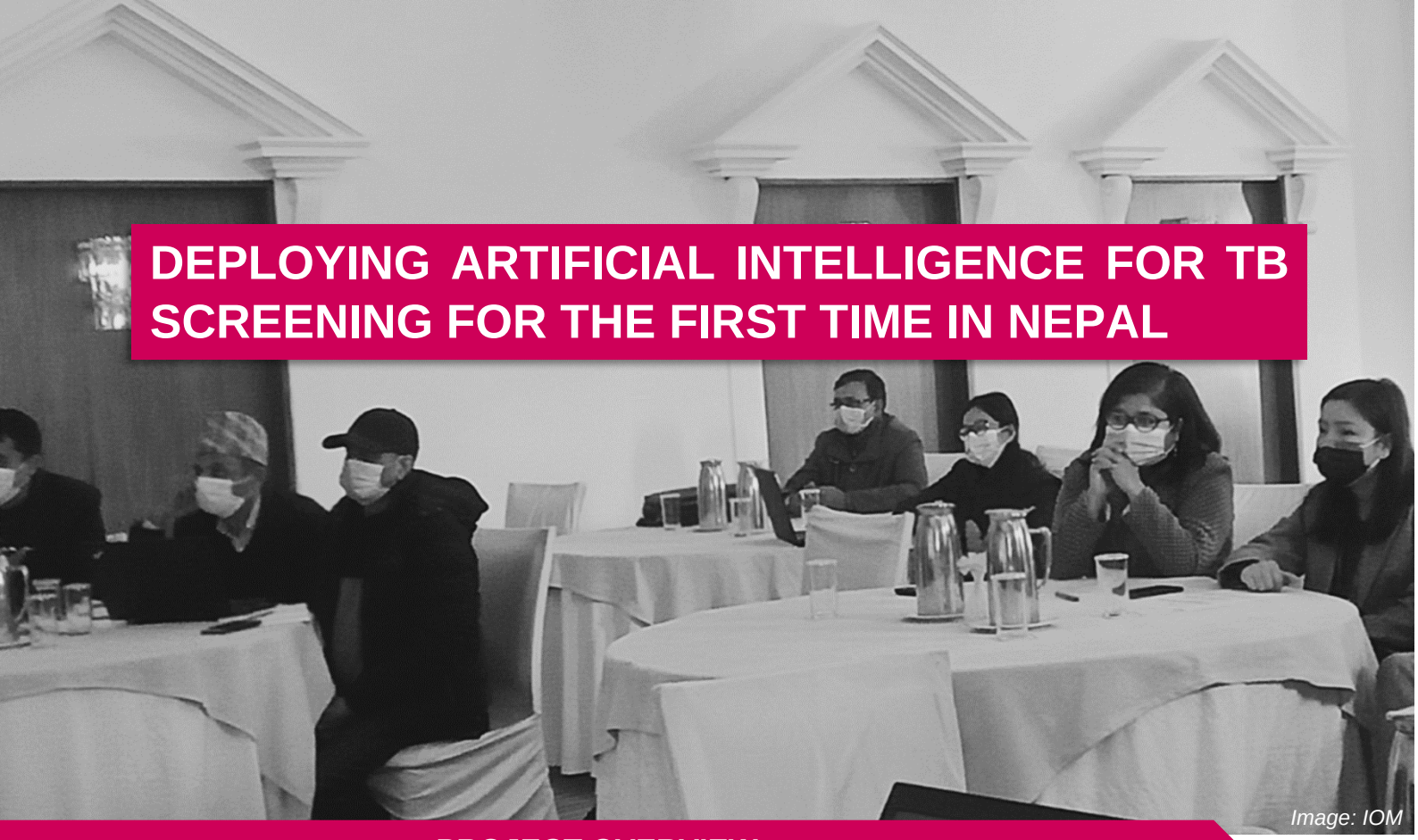

Image: IOM

PROJECT OVERVIEW

Provinces 1 and 3, Nepal

August 2021 - present

qXR (Qure.ai)

International Organization for Migration (IOM)

AI INTERVENTION

With an estimated 69,000 cases in 2020, Nepal has a high tuberculosis (TB) burden, aggravated by one of the highest rates of drug resistant disease in the world.[1,2] Fewer than half of these people have been diagnosed and notified.[1] In 2020, TB REACH supported the International Organization for Migration (IOM) to improve access to TB services in Nepal for migrant populations underserved by the current health system. However, the pandemic soon brought project activities to a standstill. It was in response to this challenge that IOM adapted its programme to explore using artificial intelligence (AI) for TB screening, with its potential to modernize case detection while mitigating the effect of COVID-19 on services.

In August 2021, IOM worked with the National TB Control Center (NTCC) to deploy the cutting-edge AI tool (qXR) **in two large Kathmandu University-affiliated research hospitals in Provinces 1 and 3,** serving a combined population of more than two million Nepalese people.

Under the project, anyone attending the inpatient or outpatient facilities at either hospital is screened first for a cough, then for other TB symptoms, and referred for assessment by a clinician. Under the clinician's direction, a high-quality digital chest X-ray is then offered, which is read by trained hospital radiologists alongside the AI software. If a person has symptoms of TB, or if their chest X-ray is indicative of the disease, they are provided with a

sensitive molecular diagnostic test (Xpert). A proportion of people without signs of TB are also given the diagnostic test to see if AI can correctly identify individuals **without** disease. **The results of all tests are documented by the project and will be used to examine the overall accuracy of AI, particularly comparing its performance to that of trained human readers.**

Image: IOM

> ***WITH AI, WE BELIEVE WE WILL BE ABLE TO CUT COSTS AND REDUCE FALSE NEGATIVES AND FALSE POSITIVES AT THE HOSPITAL AND FACILITY LEVEL. THAT WILL SAVE A LOT OF EXPENSE IN A RESOURCE-POOR SETTING LIKE NEPAL.***
>
> **– SALEENA SHAHI,**
> PROJECT ASSISTANT,
> IOM NEPAL

This project marks a turning point: it is **the first time AI has been used to detect TB in Nepal**. Given the high disease burden in the country, AI has enormous potential to **reduce costs and improve TB detection in regions where there are no radiologists**. Any future application of AI in Nepal hinges on the results of this study – and if AI fulfils its promise, this will set the precedent for AI's use to improve access to TB services nationwide.

REFERENCES

1. WHO TB profile – Nepal. Accessed November 25, 2021. https://worldhealthorg.shinyapps.io/tb_profiles/?_inputs_&entity_type=%22country%22&lan=%22EN%22&iso2=%22NP%22

2. Stop TB Partnership – High Burden Countries. Accessed April 7, 2021. http://www.stoptb.org/countries/tbdata.asp

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.