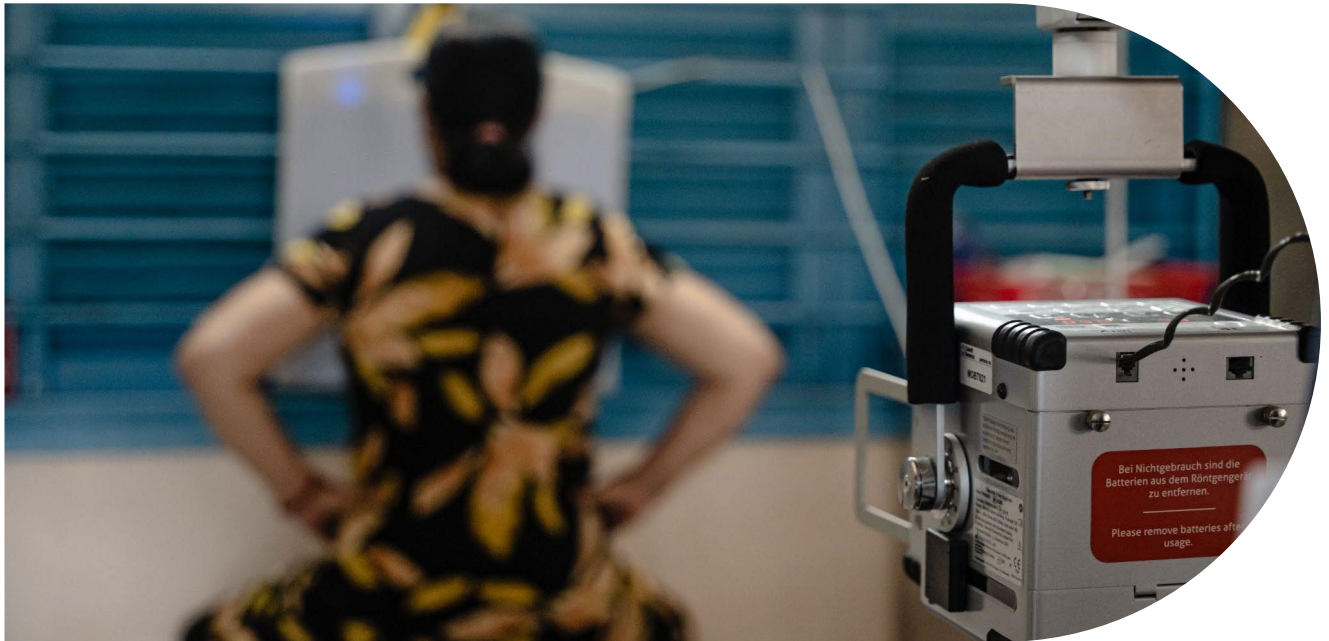**Country in Focus: Vietnam**

THE INTRODUCING NEW TOOLS PROJECT (iNTP)

# Increasing Access to TB Screening and Detection in Vietnam through Ultra-portable Digital X-ray and Computer-aided Detection Software



## Background

TB is a major public health concern in Vietnam, with an estimated 172,000 people falling ill each year with TB; however, only 103,804 are diagnosed and notified, leaving about 68,196 (39.6%) not accounted for or treated within the national healthcare system in 2022.[1]

The country is among the 30 high-burden TB countries in the world, and although the country has made progress in TB detection over the past decade, TB remains a significant public health challenge.

Vietnam's national algorithm used for TB screening and triage is called the Double X strategy (X-ray followed by Xpert). Decreases in TB notifications resulting from a national focus on COVID-19 led to a renewed effort to find more people with undiagnosed TB. To help further increase notifications, ultra-portable digital X-ray systems with software for computer-aided detection (CAD) of TB have been incorporated into the Double X strategy, in line with recommendations to utilise innovative tools in the Stop TB Partnership's Global Plan to End TB.

[1] World Health Organization. Global TB Report 2023. Country profiles available from: https://worldhealthorg.shinyapps.io/tb_profiles/?_inputs_&entity_type=%22country%22&iso2=%22VN%22&lan=%22EN%22

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CAD software utilises artificial intelligence (AI) to analyse chest X-rays and detect signs suggestive of TB. When paired with ultra-portable X-ray systems, it has the potential to identify individuals who may have otherwise remained undiagnosed, particularly in areas with limited access to healthcare services. By improving TB detection and screening in remote and hard-to-reach areas, these innovations can help to address the challenges of TB in Vietnam and continue to accelerate progress made in the fight against TB.[2]

The Stop TB Partnership, in collaboration with the United States Agency for International Development (USAID), initiated the introducing New Tools Project (iNTP) in Vietnam in 2022 to help increase access to TB screening and detection. Through the project, ten Delft Light ultra-portable digital X-ray systems with CAD4TB software (Delft Imaging, the Netherlands) were distributed by the National Tuberculosis Control Program (NTP) under the Ministry of Health (MoH). The Vietnam NTP, along with support from USAID partners, has been rolling out these innovative tools to ten facility and community-based settings in these provinces: Hanoi, Hai Duong, Hai Phong, Nam Dinh, Nghe An, Thai Binh, Tien Giang, Dong Thap, An Giang and Can Tho.

## Implementation Experience

With the support of USAID partners, the NTP has initiated the use of digital X-ray with CAD technology as a screening tool consistent with the national TB guidelines. The products were selected by the Vietnam NTP from the Stop TB Partnership Global Drug Facility (GDF) catalogue inclusive of a perpetual software licence, training, and support package and provided at a GDF-negotiated rate.

The training was delivered on-site by the manufacturer, Delft Imaging, in collaboration with the Digital Health Specialist from the Stop TB Partnership between February and March 2022. To utilise the equipment, country regulations required a special licence to operate, for which each site applied. Implementation began at the facility and community-based settings at ten sites in April 2022, and by June, all ten X-ray systems were being utilised across Vietnam. As part of the Double X strategy, confirmatory GeneXpert testing was carried out for individuals with symptoms and chest X-ray abnormalities, as well as for those with symptoms and normal chest X-rays. The screening activities specifically focused on high-risk groups, including household (HH) contacts of people living with TB and other vulnerable populations.

## Project Impact

Vietnam has been carrying out both facility and community-based activities to bring care to hard-to-reach areas and high-risk populations. The iNTP has successfully reached hundreds of individuals with TB who would have otherwise gone undetected without this project, potentially resulting in some losing their lives to TB and/or transmitting the infection to others. By detecting people with TB early, the iNTP project has allowed these individuals to access vital care, thus preserving lives and diminishing the likelihood of TB spreading within the community. As of March 2023, the NTP, with support from USAID Partners, has successfully screened more than 32,000 individuals. Over 3,500 individuals had abnormal chest X-ray results, and over 450 individuals were diagnosed with TB, of which 279 were bacteriologically confirmed.

| | | |
|---|---|---|
| **32,000+** | **~11%** | **450** |
| total individuals successfully screened | displayed abnormal chest X-ray results | individuals were diagnosed with TB |

[2.] Stop TB Partnership. The Global Plan to End TB 2023-2030. Available from: https://www.stoptb.org/global-plan-to-end-tb/global-plan-to-end-tb-2023-2030

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## Lessons Learnt

The iNTP implementation marked the first countrywide roll-out of ultra-portable X-ray and CAD across multiple provinces in Vietnam, representing a significant stride in demonstrating the potential of these groundbreaking tools on a large scale. Through this effort, several valuable lessons have been observed. The initial phase presented opportunities for learning as hurdles were overcome; navigating through intricate documentation requirements resulted in procedural insights; securing special licences, despite prolonged approval processes, fostered a deeper understanding of regulatory landscapes; deviations from the Double X strategy at the facility level unveiled the importance of following the screening and diagnostic algorithm. Additionally, several minor equipment malfunctions and software connectivity issues served as instructive moments, promptly addressed by Delft's local agent. In collaboration with USAID Partners, Delft, and Stop TB, the NTP not only surmounted these challenges but assimilated crucial lessons that propelled the seamless progression of implementation.

## Looking Forward

Vietnam continues to implement these digital tools in ten provinces under the iNTP, and the NTP is developing sustainability plans to help ensure future utilisation. The lessons learnt from these provinces are being used by other provinces to implement these new technologies as part of the broader TB response in Vietnam. The NTP, supported by USAID Partners, is conducting additional supervisory visits and training sessions to help ensure the successful scale-up of digital X-ray and CAD.

*Disclaimer: The findings in this publication are those of the authors and do not necessarily represent the views of the U.S. Agency for International Development or the U.S. Government.*

*For more information on the introducing New Tools Project, visit:*

https://www.stoptb.org/accelerate-tb-innovations/introducing-new-tools-project