Advancing Tuberculosis Diagnosis in Vietnam: Implementation of Al-Integrated Chest X-Ray Interpretation in Health Facilities

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BACKGROUND

Vietnam at-a-glance



A home for 98.8 million people across 63 provinces¹



Among 30 high TB burden countries, with an estimated incidence of 182/100,000 population, 57% treatment coverage²

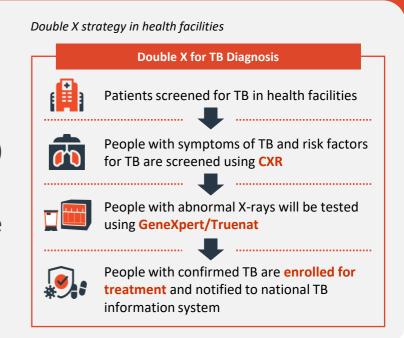
CAD-AI on demand



Quality of Chest X-ray (CXR) interpretation is critical for accurate triage for GeneXpert (Xpert) testing in the Double X model (2X)



Computer-aided Detection Artificial Intelligence (CAD-AI) was integrated programmatically into TB screening and triage 2X algorithms in health facilities in Vietnam



INTERVENTION

The USAID Support to End TB project integrated CAD-AI into the clinical workflow for TB diagnosis in priority provinces.



Analyzed **68,519 CXRs** in 2020-2021 to define thresholds and pilot two real-time models: Al-first and Al-parallel



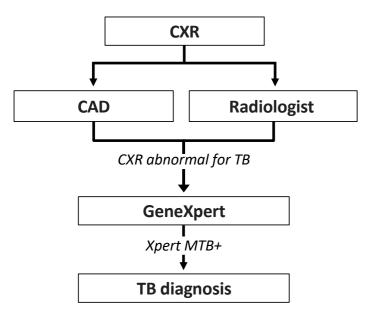
Since 2022, CAD-AI has been applied in selected health facilities based on TB burden, CXR volume, and leadership commitment



Evidence-based standard operating procedure, specifying CAD-AI threshold and integration model

FIGURE 1. CAD-Parallel Model

CAD-AI Parallel Model in health facilities







CAD-AI parallel, threshold ≥ **0.6:** software and human readers both interpret

RESULTS

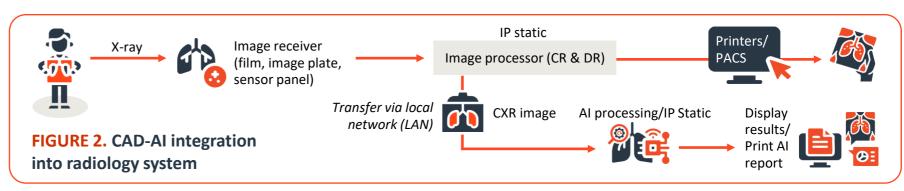


TABLE 1. TB detection results with CAD-AI integration

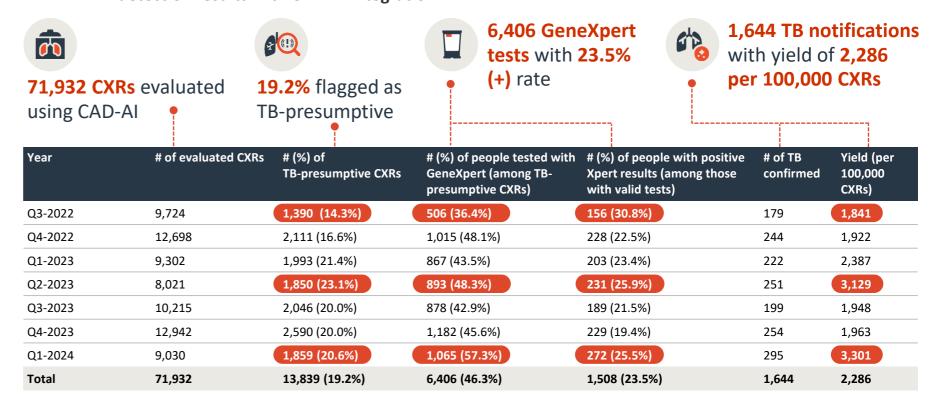
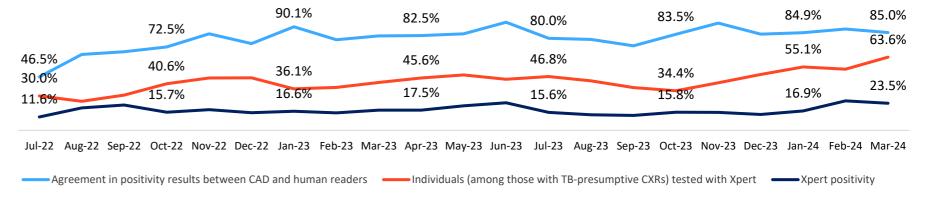


FIGURE 3. CAD-AI integration results over time



In health facilities, we observed improvements in key areas, including increased concordance between AI and human readers, suggesting better alignment in diagnostic interpretations. The number of individuals tested with Xpert also rose, indicating wider use of this tool. Additionally, the Xpert positivity rate increased, possibly reflecting more accurate detection

CONCLUSIONS



Leveraging CAD-AI for chest X-ray analysis has significantly enhanced the accuracy, efficiency, and scalability of TB detection.



CAD-AI plays a transformative role in the future of TB detection, revolutionizing the process by improving accessibility, speed, and accuracy.



By equipping district-level facilities with advanced AI tools, CAD-AI bridges healthcare gaps and promotes greater health equity for the people and communities.



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