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Harnessing Artificial Intelligence-Powered Computer-Aided Detection to Improve Implementation Efficiency of TB Case Finding and Enhance Access to TB Services in the Philippines

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INTRODUCTION

Tuberculosis (TB) persists as a public health challenge globally and in the Philippines. In 2022, the country's **TB Treatment Coverage Rate** remained low at **54%**, underscoring the need for innovative strategies to improve detection.

Current country *guidelines recommend the use of chest X-rays (CXR); however, its widespread adoption faces obstacles, including accessibility and a lack of onsite radiologists for immediate image interpretation*.

Traditional case finding (CF) utilizes digital X-ray, where images are sent to a radiologist for reading, and results are delivered 3-5 days after the event.

AIM

USAID's TB Platforms adapted the **use of computer-aided detection (CAD)** technology to enable **CXR screening** feasible in diverse settings.

The study aimed to determine the *applicability of CAD in diverse settings* for improving implementation efficiency and increasing TB case detection.

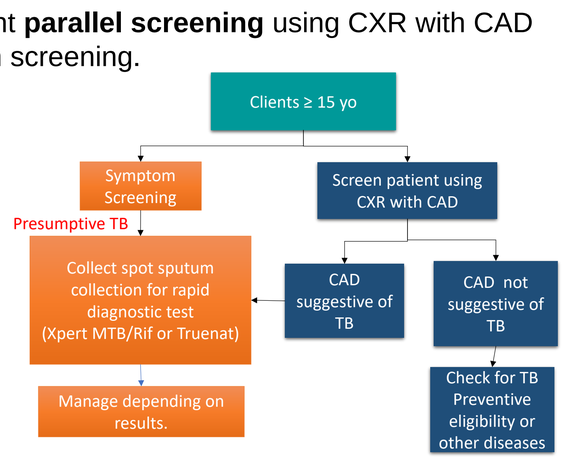
METHOD

- The project utilized 3 types of CAD in/among:
  - *Community and facility-based settings*
  - *Urban, rural, and remote areas*
  - *High TB burden sites*
  - *High TB-risk and vulnerable populations*

Type of CAD	Threshold Score Used
Delft CAD4TB	0.5
Lunit Insight CXR	0.6
Qure.AI	0.6

- Clients underwent **parallel screening** using CXR with CAD and TB symptom screening.

Use of CXR/CAD enabled onsite sputum collection since CXR results are released in 1-2 minutes.



RESULTS

Figure 1. Cascade of Care for Traditional TB Case Finding, 2019-2023

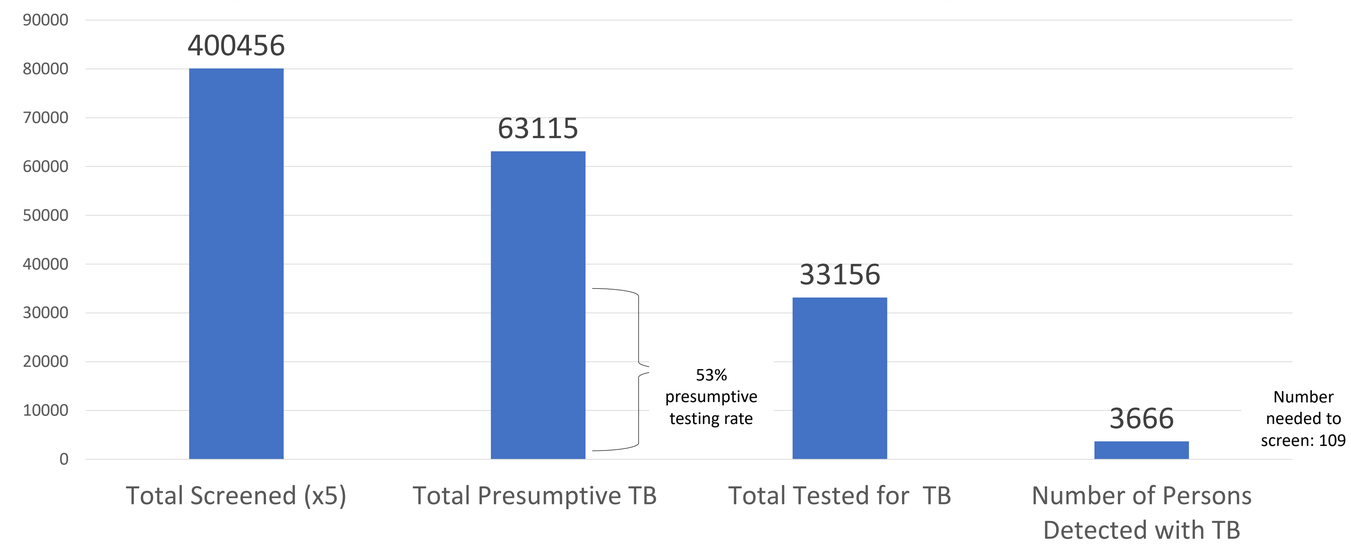
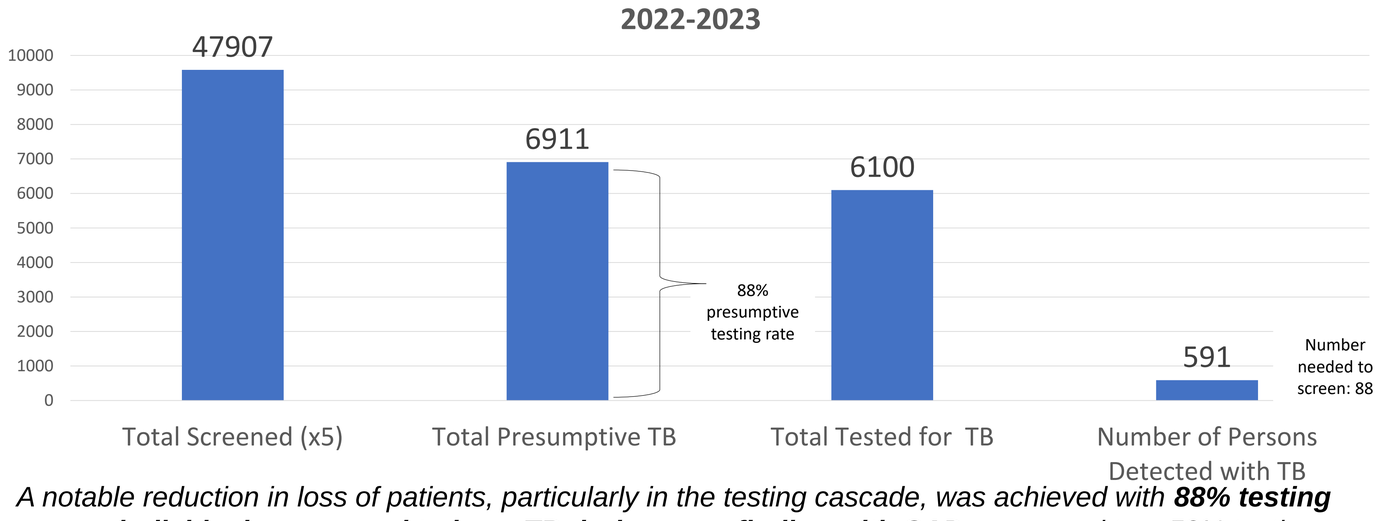


Figure 2. Cascade of Care for TB Case Finding Using Computer-Aided Detection, 2022-2023



*A notable reduction in loss of patients, particularly in the testing cascade, was achieved with **88% testing among individuals presumed to have TB during case finding with CAD,** compared to a 53% testing rate during the traditional CF. molecular test using Xpert MTB/RIF or Truenat.*

Number needed to screen is also lower when using CAD.

***Turnaround time from screening to diagnosis decreased** from 7-30 days in traditional CF to 4.5 in CF with CAD.*

CONCLUSIONS

The use of CAD yields substantial results in TB case detection. It demonstrates versatility across various settings in the country, highlighting its potential to enhance healthcare accessibility among high-risk populations and those with limited healthcare access.

CAD aids in expediting the testing and diagnostic process and in reducing patient drop off across the TB care continuum.

CAD supports healthcare providers by optimizing their workflow, diminishing necessity for additional patient follow-up.

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