Evaluating the impact of computer-aided X-ray diagnosis to optimise Xpert-orientated community-based active case-finding for TB (XACT-19)

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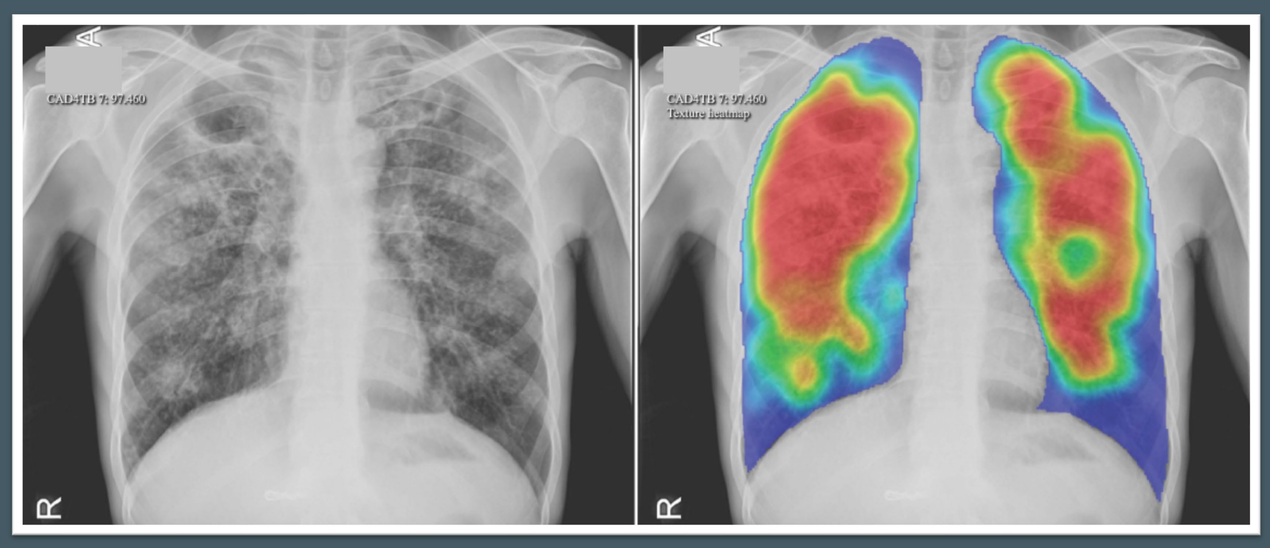
AI-driven computer-aided detection (CAD), used during community-based active case finding, **detects a high burden of tuberculosis**



1. Introduction

- Almost 30% of persons newly diagnosed with TB are undiagnosed or unreported.[1]
- Detecting cases in TB/HIV endemic communities have been restricted by inadequate point-of-care (POC) diagnostic tools.[2]
- Computer-aided detection (CAD) has been recommended by the WHO for screening for TB,[3] however, implementation of CAD in community-based active case finding (ACF) for TB is unclear.

2. Methods

- A validated Xpert-orientated ACF for TB (XACT) model,[4] with an ultra-portable X-ray and CAD software, is being used (Figure 1).
- In an ongoing ,open-labelled randomised controlled trial (RCT), high-risk persons with presumed TB (n=6 200) are being recruited from TB/HIV endemic communities (Figure 2).

Figure 1. Left: XACT model using a portable battery-operated genomic tool within a low-cost mobile clinic (Dheda et al. Lancet Respir Med, 2019). Right: ultra-portable x-ray with CAD software utilising texture heat map overlay to score and indicate the likelihood of active TB (Delft imaging).

3. Results

- A total of 3 300 participants have been enrolled, of which 1 544 (47.8%) were living with HIV (median CD4 601) and 2 006 (62.1% were asymptomatic).
- **TB positivity of 3.6% (118/3 300), of which 49/118 (41.5%) had asymptomatic TB.**
- Of all TB-positive participants, **40/118 (33.9%) were smear-positive (implying probable infectiousness).**

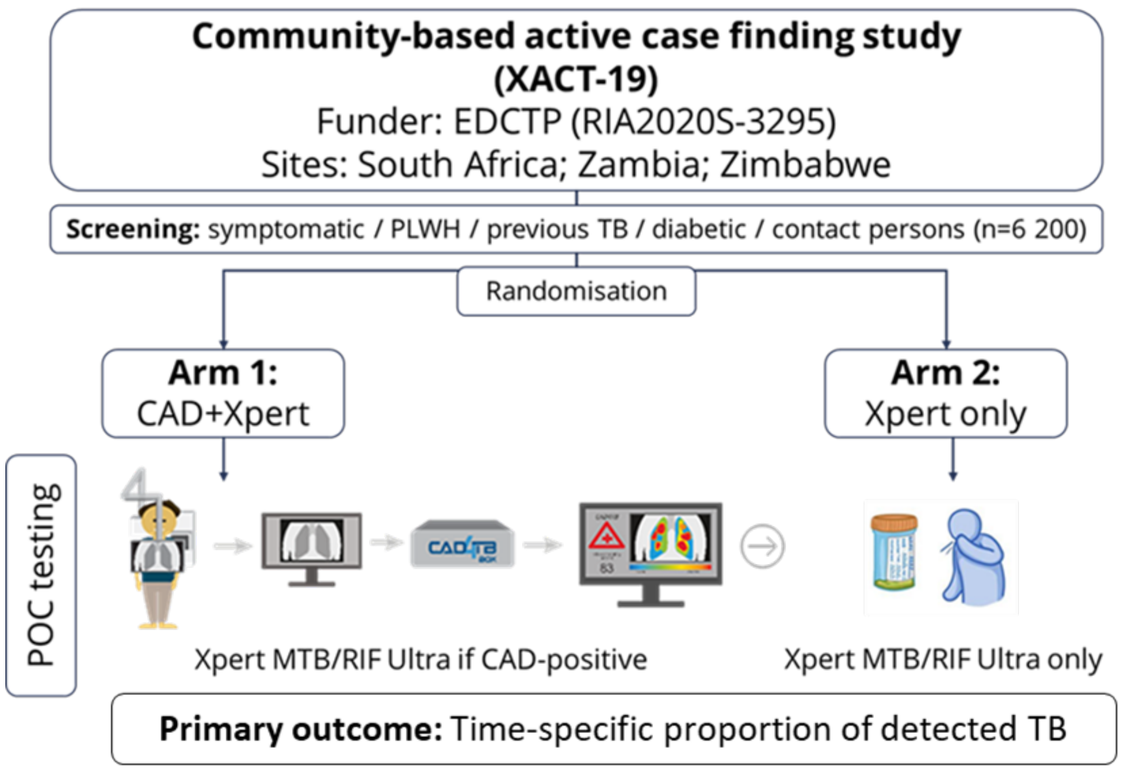


Figure 2. XACT-19 RCT overview (image adapted from Delft Imaging).

4. Conclusion

- Community-based ACF, using CAD, detected a high burden of TB, of which a significant minority (~30%) was probably infectious.
- These data have implications for ACF strategies in high burden settings.

Scan the QR code to visit the XACT-19 website

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References

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