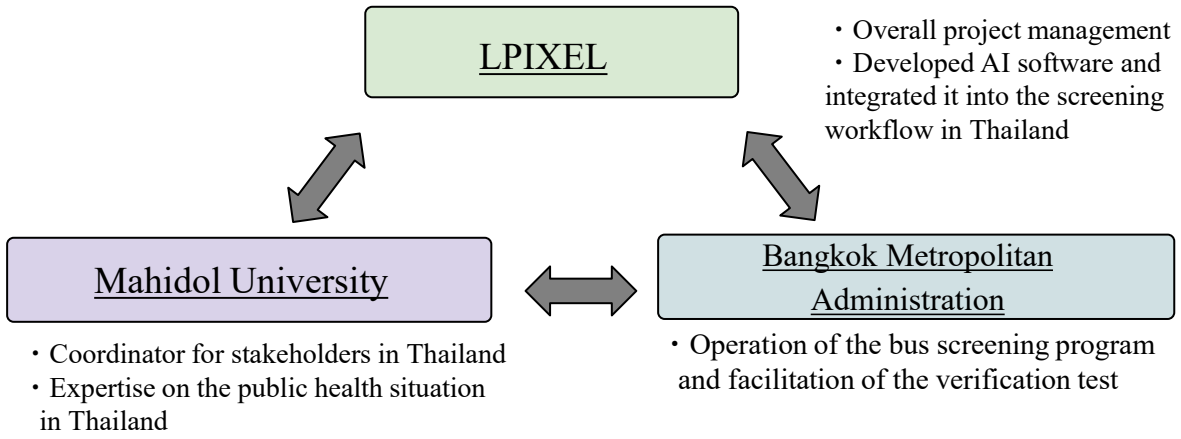
LPIXEL Inc.

Demonstration of the use of diagnostic imaging AI to enhance mobile tuberculosis screening programs in Thailand

Objective of the project

This project aims to address tuberculosis (TB)—a major public health challenge in Thailand and several other Asian countries—by reducing the time required to initiate treatment following routine chest X-ray screening. Specifically, we assessed whether deploying EIRL Chest TB, an AI-powered diagnostic support system developed by LPIXEL, in mobile X-ray screening buses operating in Bangkok could facilitate the rapid identification of individuals requiring further testing by analyzing images immediately after acquisition. By streamlining the diagnostic process, this initiative seeks to enhance TB detection rates and contribute to the global effort to eliminate the disease.

Cooperation with local companies/governments



Targeted economic/social issues

Tuberculosis remains the world's deadliest infectious disease, with an estimated 10.8 million new cases and 1.25 million deaths globally in 2023. The COVID-19 pandemic also severely impacted global TB control, leading to an estimated 500,000 excess TB deaths between 2020 and 2022 due to disruptions in diagnosis and treatment.

Thailand is a designated "high TB burden country," with an estimated 143 cases per 100,000 population in 2021. A significant challenge in TB control is the estimated 30% of TB patients that remain undiagnosed and untreated, making the reduction of "missing cases" an urgent priority. This is exacerbated by regional disparities in medical access, including a shortage of specialists, particularly experienced radiologists, who tend to be concentrated in urban areas. Furthermore, the pandemic-induced disruptions in TB testing and treatment services led to a significant drop in new case notifications between 2020 and 2021, reportedly setting back progress by 12 years.

These issues collectively contribute to a fragile diagnostic system, a stalled TB service, and a large number of undetected patients, particularly in vulnerable regions and among marginalized populations.

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Demonstration period

April 2024 – May 2025

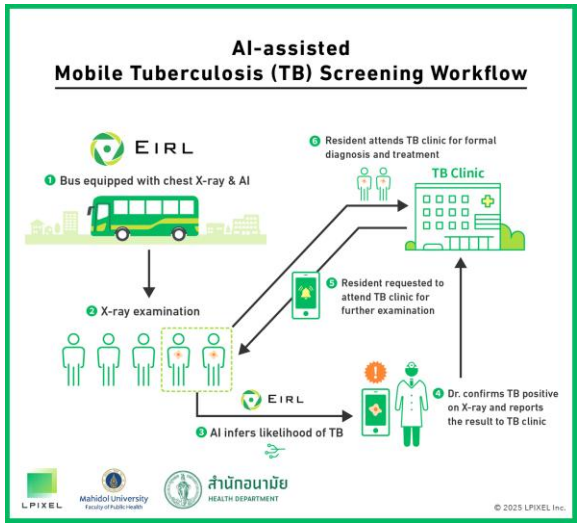
Details of demonstration

This demonstration project integrated LPIXEL's TB detection AI, EIRL Chest TB, into mobile chest X-ray screening workflows conducted via medical buses in Thailand. Under the existing system, it typically took around three weeks from the time of screening to notify individuals with suspected TB, which is a delay believed to contribute to low follow-up rates.

This project aimed to improve follow-up by analyzing X-ray images on-site so that suspected positive cases could be prioritized for immediate physician review, allowing health workers to inform individuals while they were still at the screening location.

During the demonstration period, EIRL Chest TB was deployed on two mobile screening buses operated by the Bangkok Metropolitan Administration. The evaluation focused on three components: 1. A prospective study assessing the performance of AI-integrated mobile screening, 2. A retrospective study comparing with conventional mobile screening workflows without AI, and 3. Supplementary data collection to further improve the AI software's performance.

Project outcome / future plans



This project was highly significant in that it successfully demonstrated the effectiveness of a novel workflow for mobile X-ray screening operations in Thailand using not-yet-commercialized unmarketed AI software. During the demonstration period, the system effectively analyzed up to 500 X-ray images per day across two separate screening buses in Bangkok and successfully implemented a mechanism for prioritized notification to radiologists.

It was confirmed that the system has the potential to reduce the patient notification period from around three weeks to same-day reporting. However, several challenges to routine implementation were identified, including the risk of increased radiologist workload due to a high false-positive rate from conservative AI settings, the need for multilingual system optimization, and the issue of managing operational costs. Moving forward, we plan to leverage the data and experience gained to further invest in developing medical imaging AI that is better suited for real-world use. Our goal is to help address healthcare challenges in Southeast Asia—such as tuberculosis and other diseases—using Japan-developed technology.

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