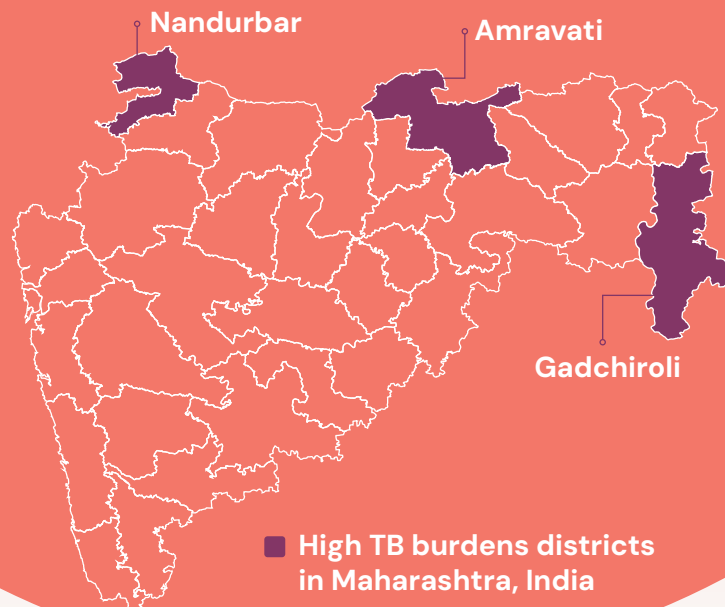# X-rays on Wheels

Case Study

Tuberculosis (TB) continues to impose a significant burden on tribal populations in India, a high-risk group for the disease. Despite its preventable and curable nature, TB remains a formidable health challenge for these communities.

Evidence indicates that the prevalence of pulmonary TB is alarmingly higher among tribal populations at 703 per 100,000 compared to the national average of 316 per 100,000.

Tribal Population per 100,000

**703**

National average per 100,000

**316**

0                                                                100,000
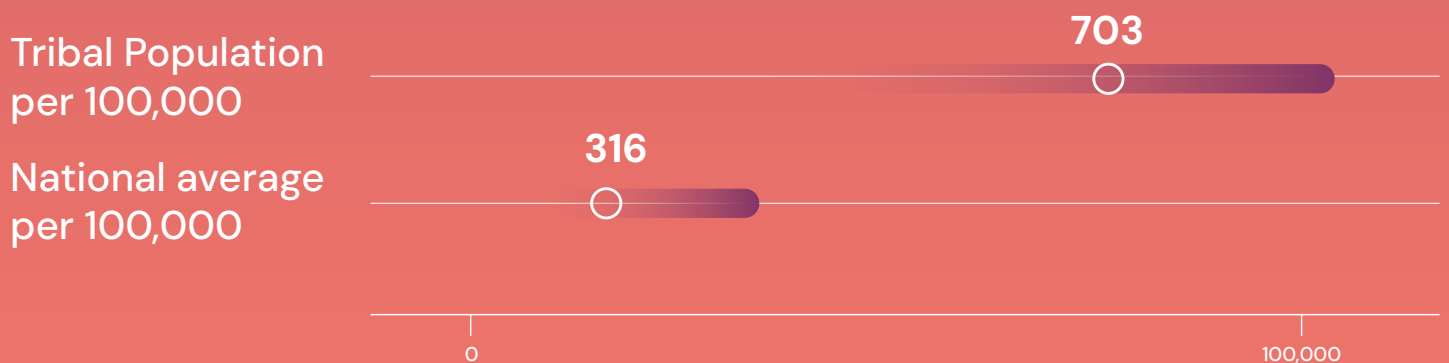
India bears the highest global burden of TB, and the disease exacts a heavy toll on the country's tribal communities.

In Maharashtra, 16 districts are mapped as tribal districts, either partially or wholly. According to the India TB Report 2023, a total of 18,456 TB cases from tribal communities were identified in the state that year. The tribal districts of Maharashtra, particularly Gadchiroli, Nandurbar, and Amravati, have consistently grappled with high TB burdens, underscoring the need for targeted interventions and innovative solutions to address the disproportionate impact of TB on these vulnerable populations.

Nandurbar

Amravati

Gadchiroli

■ High TB burdens districts in Maharashtra, India

# X-rays on Wheels

## An Initiative by STDC Nagpur

The State Tuberculosis Training and Demonstration Centre (STDC) Nagpur, is a key institution in the Nagpur region of Maharashtra, India. It plays a pivotal role in training healthcare professionals, disseminating knowledge, and promoting best practices in TB prevention, diagnosis, and treatment. Additionally, STDC Nagpur runs targeted initiatives to address TB challenges affecting tribal communities and other vulnerable populations.

One notable initiative aimed at identifying more TB cases in tribal communities of Maharashtra began in December 2019. This initiative involved deploying a medical van equipped with an X-ray machine, driven to various tribal communities across Maharashtra by Manish, the designated van driver for this project, for mass screening. The on-ground operations, led by the drivers, work in close coordination with District Tuberculosis Officers (DTOs), Senior Treatment Supervisors (STSs), and Asha workers across multiple districts.
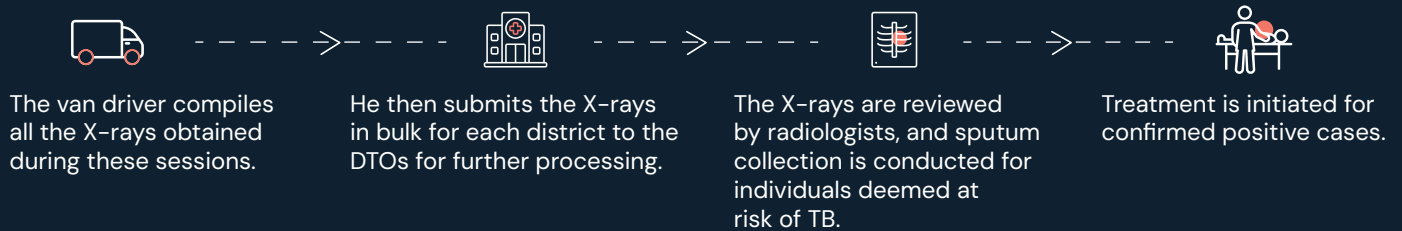
### STDC plans for the van to travel extensively

Covering up

**3,000 kilometres**
in a month

Conducting
X-ray screenings

**over 800 individuals**
from tribal communities.

# Initial Screening Process

Screening camps conducted in various locations within a district, typically span 15-20 days.

To comprehensively cover the area,

The van driver compiles all the X-rays obtained during these sessions.

He then submits the X-rays in bulk for each district to the DTOs for further processing.

The X-rays are reviewed by radiologists, and sputum collection is conducted for individuals deemed at risk of TB.

Treatment is initiated for confirmed positive cases.

**However, the turnaround time from screening to sputum collection for presumptive cases could take up to 1.5 months, highlighting a significant delay that impacted timely treatment initiation.**

## Challenges Faced

This initiative faced several challenges in tribal areas, including poor internet connectivity and limited amenities like proper accommodation for the van driver. Despite these obstacles, the initiative commendably provided X-ray screening in tribal areas lacking adequate facilities.

**However, the main challenge was the lengthy turnaround time for patients.**

Due to the absence of radiologists at screening camps, it used to take more than a month for tests to be done, and even longer for the treatment to get started. This delay led to late treatment initiation and potential oversight of TB cases.

To address these issues, STDC Nagpur collaborated with Qure.ai with funding support from India Health Fund aiming to improve TB detection and treatment in tribal communities.

## Collaboration with Qure and India Health Fund

With funding support from India Health Fund, collaboration between STDC Nagpur and Qure.ai began in January 2023, marking a significant advancement in tuberculosis (TB) detection and treatment initiatives. On January 12th and 13th, 2023, Qure staff conducted on-site deployment and provided training to over 10 personnel at STDC Nagpur, including the Chief Medical Officer (CMO).

After training, the van driver integrated qXR into the screening process, significantly altering his workflow. **Instead of submitting X-rays in bulk, he now uploads them to qXR everyday. qXR identifies individuals with presumptive or abnormal chest X-rays, allowing prompt sharing of details with the DTO for swift action by STSs and Asha workers for further testing and treatment. This collaboration reduced the turnaround time to sputum collection from 1.5 months to 1 week, improving TB detection and treatment efficiency in tribal communities.**

**Turn around time**

Qure ai last IHF intervention

**1.5** Months ------> **1** Week

# A Day in the Van

The van begins a visit after receiving a plan from STDC Nagpur, detailing the district to be covered and the dates for the screening camp. Covering one district could take up to 15–20 days. This plan is formulated based on prompts received from District Tuberculosis Officers (DTOs), who identify communities needing intervention to manage the TB burden. Once the plan is finalised, the van sets out for the designated location, aiming to arrive at the assigned Primary Health Centre (PHC) by 9 am.

## The day unfolds as follows

### Community Mobilisation

A day or two prior to the van's arrival, the ASHA workers would have already informed the community about the upcoming chest screening camp. Upon reaching the PHC, the van driver, along with Senior Treatment Supervisors (STSs), ASHA workers, and health assistants, sets up the camp.

### Screening Process

The screening process begins promptly with individuals from the community presenting themselves for chest X-rays. With the support of the on-site team and healthcare professionals, over 60 X-rays can be conducted in a day. The van driver simultaneously uploads each X-ray onto his pen drive.

### Data Management and Follow–up

By late afternoon, around 4–5 pm, the camp concludes its operations for the day. Later in the evening, all the X-rays are uploaded to qTrack from the pen drive. Using the app, the van driver identifies and informs the DTO about abnormal and presumptive cases detected during the day's screening.

### Coordination for Further Testing and Treatment

The DTO takes over from there, coordinating further testing and treatment for the presumptive and abnormal cases. This efficient flow ensures that identified cases receive prompt attention, reducing delays in the subsequent care process.

**This detailed account provides a snapshot of the daily operations within the initiative, highlighting the efficient use of technology and coordination to manage and improve TB screening in tribal areas.**

# Impact Created

During the one-year project from January 2023 to December 2023, the collaboration with Qure led to a significant increase in the average number of Chest X-rays conducted in one district.

**Chest X-rays done from January to December 2023**

Rising from
**800** - — →— — - **Close to 1,500**

**This significant escalation in screening efficiency can be directly attributed to the introduction of qXR technology.**

**A total of 6,581 X-Ray screenings were conducted across 16 districts during this project period, out of which 730 X-rays were marked as abnormal, and 728 individuals were marked as TB presumptive.**

**The notable outcome was the considerable decrease in turnaround time (TAT) from X-ray screening to sputum collection, dropping from 1.5 months to one week.**

This shortened TAT facilitated the initiation of treatment at an earlier stage as cases could now be identified significantly faster than previously.

The streamlined process also significantly increased the yield of TB-positive cases in 2023 compared to previous years. With qXR's assistance, not only are TB cases identified in tribal communities, but other abnormalities are also flagged, ensuring appropriate action. Additionally, qXR simplifies data management for DTOs by recording patient information and history on the app, eliminating manual record-keeping.

Overall, the collaboration with Qure and India Health Fund has been instrumental in enhancing TB detection and management in tribal communities in the region, marking a significant step forward in improving healthcare outcomes.

"Collaborating with Qure has revolutionised our screening process. With the integration of qXR, we've witnessed a remarkable increase in the number of X-rays conducted. Previously, the absence of radiologists in screening camps led to a prolonged turnaround time of 1.5 months for sputum collection, hindering timely treatment initiation. However, with qXR's instantaneous identification of presumptive and abnormal cases, we've slashed our turnaround time to just one week. This expedited process ensures that potential TB cases are promptly addressed, reducing the risk of transmission and complications.

In 2023 alone, our collaborative efforts with Qure yielded impressive results. We identified 730 abnormal X-rays and 728 TB presumptive individuals across 16 districts. This success underscores the effectiveness of our partnership. Furthermore, qXR's ability to flag abnormalities beyond TB has been invaluable in ensuring comprehensive healthcare for tribal communities."

**Manish**
*Van Driver*

## About IHF

Set up by Tata Trusts in 2017, India Health Fund is a not-for-profit company which funds and de-risks the development of science and technology-based innovations for communicable diseases, develops partnerships in India and other developing countries to scale these solutions and collaborates to develop financing mechanisms for their development and scale.

## About Qure.ai

Qure.ai is a health tech company that uses deep learning and Artificial Intelligence (AI) to make healthcare more accessible and equitable for patients worldwide. Our solutions power the efficient identification and management of Tuberculosis (TB), Lung Cancer and Stroke to support clinicians and propel developments in the pharmaceutical and medical device industries. We empower healthcare by helping to identify conditions fast, prioritize treatment planning and ultimately improve quality of patient life.