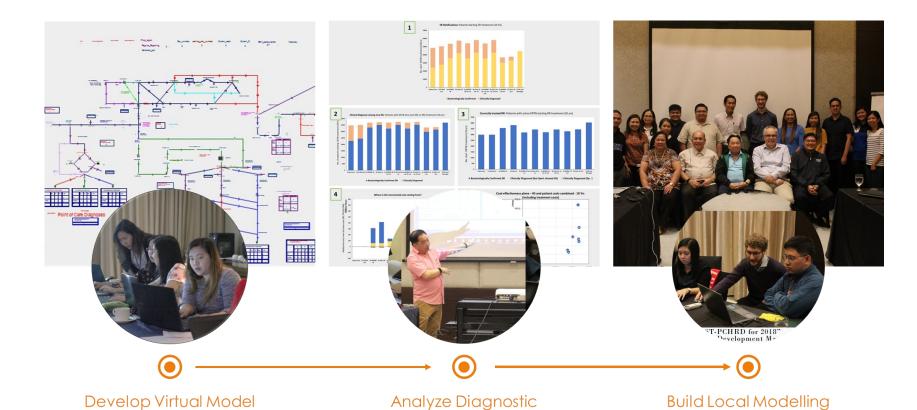# Impact Assessment of Diagnostic Tools and Algorithms for Multi Drug Resistant (MDR-TB) and Drug Sensitive Tuberculosis (TB) in the Philippines (TB-FIT Project)

Yu, CY[1]; Langley, I[2]; Dalay, VD[1]; Abong, JA[1]; Mendoza, VM[1]; Tomeny, E[2]; Squire, SB[2]

[1] De La Salle Medical and Health Sciences Institute
[2] Liverpool School of Tropical Medicine

Correspondence: cyyu@dlshsi.edu.ph

Develop Virtual Model → Analyze Diagnostic Strategies → Build Local Modelling Capacity

The TB-FIT project is a 3-year long project which ran from 2016-2019, primarily with collaboration between LSTM and DLSHSI and further links with and support from the Department of Health. Project has been funded by the MRC Newton Fund and the Department of Science and Technology – Philippine Council for Health Research and Development.

TB-FIT project aims to **equip Filipino researchers** and the National TB Program of the Philippines with a **modelling approach** that can be used to project the **impact of new diagnostic** tools and algorithms for **MDR-TB and TB**, firstly in Cavite province and then beyond.

Key Project Activities

Activities that were fundamental in the project implementation:

- TB Diagnostic Pathway mapping and Data Collection on process indicators in Cavite, and select provinces & regions in the Philippines

- Virtual Model development for ten diagnostic strategies

- Capacity Building of stakeholders at different data levels/ management (local, provincial, and regional)

- Training Workshops & Focus Group Discussions were highly interactive

- Multi-level stakeholder meetings with DOH - NTP representatives

Model Inputs

- TB Diagnostic Pathway – central to Virtual Health System Modelling

- Diagnostic accuracies (sensitivities and specificities of algorithms, physicians clinical diagnosis)

- Patient characteristics
    * Volumes
    * Types
    * Proportions sent to diagnostic committee
    * Lost to Follow up

- Patient Cost

- Health System Cost

- Disability Weights

- Diagnostic outcomes

Result Highlights

- Xpert MTB/RIF as a cost effective replacement for microscopy
- DRUG SENSITIVE TB CASES correctly treated
    * Bacteriologically Confirmed would rise by 35-45%
    * Clinically diagnosed TB cases are likely to fall by 67-77%
    * Overall projected change not significant
- MDR-TB CASES correctly treated
    * Would rise by 43-53%
    * Highly cost-effective
    * Overall numbers on drug sensitive TB treatment would fall due to reduced clinical diagnosis
    * ULTRA cartridge provides a further improvement (MDR-TB +5%
- OMNI with ULTRA cartridge
    * When available as Point of Care test would be the best option as is likely to reduce lost to follow up and will therefore increase case detection for DS-TB and MDR-TB.)

"TB-FIT is NTP's first subnational modelling exercise. Unlike other TB models which focuses at the country level, this model may be applied at facility, province, or regional level. Through the TB-FIT project, not only did I develop my modelling knowledge but also skills in new technology (Witness)." - Department of Health -National TB Program

Key Impacts

- GeneXpert rollout projections would see: an increase in Bacteriologically Confirmed cases, a likely decrease in Clinically Diagnosed, and a substantial increase in Multi Drug Resistant-Tuberculosis cases
- Genexpert replacing microscopy is cost effective however policymakers should be wary of taking a one-size-fits-all approach.
- Cost survey findings was used to improve the existing cost survey by the World Health Organization.
- Department of Health—National TB Program utilized the insights gathered from the results through across different core levels of the NTP and in their respective region.

Publications

Tomeny EM, Mendoza VL, Marcelo DB, Barrameda AJD, Langley I, Abong JM, Dalay VB, Yu CY, Squire SB. Patient-cost survey for tuberculosis in the context of patient-pathway modelling. Int J Tuberc Lung Dis. 2020 Apr 1;24(4):420-427. doi: 10.5588/ijtld.19.0206. PMID: 32317067.

Abong J, Dalay V, Langley I, Tomeny E, Marcelo D, et al. (2019) Use of GeneXpert and the role of an expert panel in improving clinical diagnosis of smear-negative tuberculosis cases. PLOS ONE 14(12): e0227093. https://doi.org/10.1371/journal.pone.0227093