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Practical training on TB diagnostics. Photo Credit: Kirubel Eshetu

TECHNICAL BRIEF

HARNESSING INNOVATIVE AND FEASIBLE STRATEGIES TO OPTIMIZE TB CASE FINDING: HIGH-LOAD HEALTH FACILITIES INITIATIVE IN ETHIOPIA

December 2023

BACKGROUND

According to the World Health Organization (WHO) Global TB reports, there has been a progressive decline in TB incidence in Ethiopia from 192 per 100,000 population in 2015 to 119 per 100,000 in 2022. National TB treatment coverage reached about 82% in 2022, indicating that about one-fifth of people with TB are still undetected (WHO Global TB report, 2016 and 2022). The national TB prevalence survey of 2010/2011 reported >50% of confirmed TB cases without chronic cough but identified by chest X-ray (CXR) screening. A national-level TB program-specific review in March 2023 found that these undetected TB patients are missed along the patient care pathway at health facilities (HFs). In each region of the country, high-load HFs (HL HFs) serve more than 5,000 patients per month. Factors at these HFs that have contributed to a low yield of TB cases include lack of awareness and training on new TB screening and diagnostic approaches among clinicians. An innovative, feasible, and cost-efficient approach to find the missed TB cases within HFs was needed and led to the design of the HL HFs initiative. This initiative introduced a more sensitive screening tool—CXR—at 10 HL HFs supported by the US Agency for International Development (USAID) Eliminate TB Project, contributing at least 40% of zonal TB case finding in a quarter. The selected hospitals had only been using clinical screening and had suboptimal recording of TB screening activities; these areas needed to be strengthened to identify the missed TB cases at these HFs. Ethiopia has recently started to introduce both digital and artificial intelligence-mounted X-rays to assist with the interpretation of CXRs.The five-year US Agency for International Development (USAID) Eliminate TB (ETB) Project implemented by Management Science for Health (MSH) aims to support the National TB and Leprosy Program, Government of Ethiopia, and other stakeholders in building, through targeted investment, programmatic and leadership capabilities to reduce the incidence and mortality of TB and eliminate catastrophic costs for patients.

PROBLEM STATEMENT

FORMATIVE ASSESSMENT OF HL HFS

CXR had not been widely used as a TB screening tool in Ethiopia, and not all people with presumed TB were being tested using highly-sensitive rapid molecular diagnostics. The USAID Eliminate TB Project conducted an assessment from January to March 2021 to identify missed screening opportunities at six HL HFs. The assessment found optimal referral linkages in catchment HFs and within the community, but HFs lacked registers to register patients referred with presumed TB. There was no standardized registration book for patients referred to the HF coming with referral papers, which resulted in loss of patients between these two points. The TB care pathway from entry to exit within HFs was confusing and not standardized, and people with presumed TB were often missed at various service delivery points within HFs. In addition, the intra- and inter-facility referral systems were sub-optimal, and there was no specific register to record and track the number of self-referred patients.

The assessment also indicated that the persons with presumed TB referred from triage to outpatient departments (OPDs) were not properly documented as there was no register. Some of those with presumed TB identified at OPDs could not be traced at lab registers. Specifically, when patients could not produce sputum for an Acid-Fast Bacillus (AFB) or GeneXpert evaluation, they might be instructed to come back the next day, but there was no mechanism for follow-up if they did not show up as per the appointment.

All people with presumed TB identified at triage were expected to be registered at the OPD, and those who were registered at triage and the OPD could be sent for lab investigation. However, at the HL HFs with comprehensive triage registers, 31.7% more people with presumed TB were registered at triage than in OPDs (1,387 vs 948). Likewise, there was a 10.7% difference between the number of people with presumed TB detected at OPDs (948) and the number examined in the laboratory register (847) (table 1). The differences could be because of missed or unregistered people with presumed TB. It is essential to standardize the TB care pathway at HFs to properly track people with presumed TB so that missed TB cases can be minimized.

Table 1: Results from formative assessment: Missed opportunity of TB service delivery at six HL HFs, January–March 2021

Variables	Frequency or percent
# people with presumed TB registered at triage	1,387
# people with presumed TB from triage and registered at general OPD	948
% people with presumed TB from triage and registered at general OPD	68.3
# sent for investigation (AFB/GeneXpert, CXR, other) from those registered at general OPD	847
% sent for investigation (AFB/GeneXpert, CXR, other) from those registered at general OPD	89.3
# with the investigation result from sent for investigation	840
% with the investigation result from sent for investigation	99.2
# diagnosed with TB	183
% of diagnosed TB patients linked to treatment	100.0

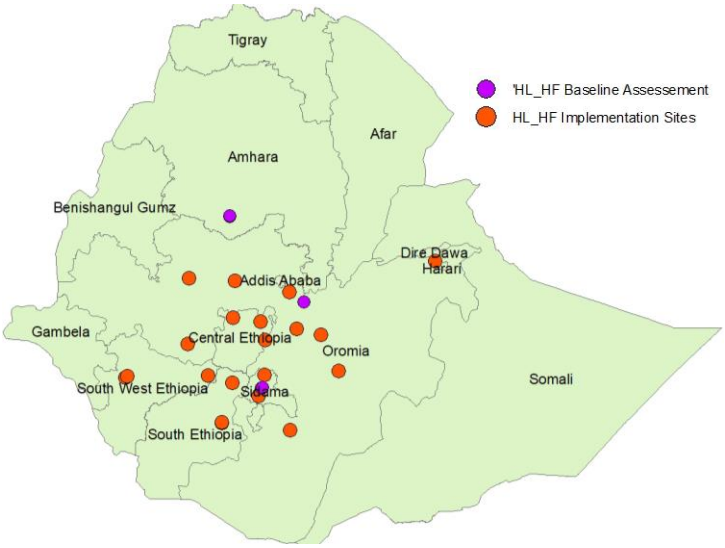

Figure 1. Map of health facilities that participated in the assessment, HL HFs initiative, and introduction of CXR as a primary TB screening tool

Orientation of clinicians from HL HFs, October 2022. Photo credit: Tilay Tasew

INTERVENTIONS

STAKEHOLDER ENGAGEMENT

In line with the National Strategic Plan, the project collaborated with regional health bureaus and HF management teams to implement the HL HFs initiative, focusing on the following interventions:

1. Standardizing the TB Care Pathway

In October 2022, the USAID Eliminate TB Project, in collaboration with stakeholders, began to orient the management teams and clinicians of the selected 20 HL HFs on:

- Standardizing the TB care pathway within an HF
- Proactive TB screening at each service delivery point to avoid missing people with presumed TB
- Proper registration of people with presumed TB at service delivery points
- Maximize the use of GeneXpert as a point-of-care testing tool
- Proper linkage to treatment and quality recording and reporting

This created the opportunity to enhance screening at OPDs (figure 2).

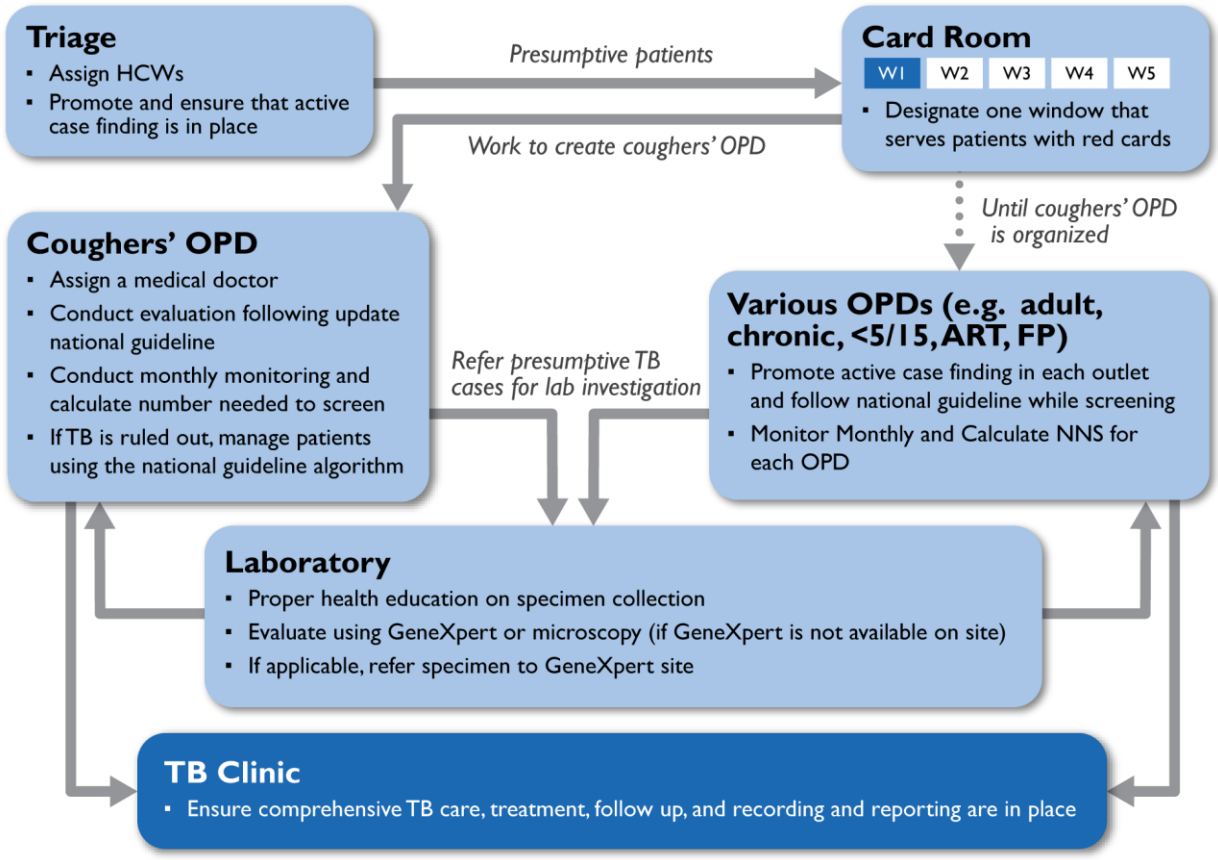

Figure 2: Standardizing the TB care pathway

Steps in the standardized TB Care Pathway (figure 2)

- **Triage:** Health care workers (HCWs) are assigned at triage, where they should proactively screen clients for TB symptoms irrespective of the presenting illness and send any person with presumed TB with a colored piece of paper to a designated window at the card room.
- **Card room attendants:** A designated window for persons with presumed TB will facilitate fast tracking.
- **Coughers OPD:** A medical doctor is assigned to the coughers OPD, where they attend to patients while taking the required precautions when evaluating a person with presumed TB. People with presumed TB are evaluated as per the National Guideline and sent for GeneXpert and/or CXR evaluation. When TB is ruled out, the clinician can manage the patient. When a person is diagnosed with TB, they are sent to the TB clinic.
- **Other OPDs:** In situations where the coughers OPD is not yet set up or functioning in an HF, all clinicians at any OPD should actively screen for symptoms of TB, irrespective of the presenting illness, and manage presumptive TB cases as indicated in the National Guideline. People with presumed TB should be screened with GeneXpert and/or CXR evaluation. Individuals diagnosed with TB are sent to the TB clinic.
- **Laboratory:** The lab technologist should guide the person with presumed TB on how to produce sputum for analysis, conduct the GeneXpert evaluation, and send the results to the clinician at coughers or other OPD.
- **TB clinic:** A trained clinician should ensure proper TB care, treatment, or linkage/referral to a directly observed therapy clinic and/or record and report the TB case.

2. Introducing the use of CXR for TB screening in high-risk populations

The National Guideline indicates that asymptomatic HRGs should undergo CXR evaluation. However CXR is not yet a free service in the country. The USAID Eliminate TB Project covered the cost of CXR for presumptive HRGs, which is a crucial step to reducing catastrophic costs to TB patients. HRGs eligible for CXR screening included immigrants or displaced

people, prisoners, homeless people, people living with diabetes, people living with or at risk of HIV, mining workers, contacts to a TB index case, residents of congregate settings, and chronic renal failure patients. As part of intensive case finding among HRGs, the project piloted the provision of free CXR screening in 10 HL hospitals across the projects' supported regions at the time (Oromia, Amhara, Sidama, Central Ethiopia, and South West Ethiopia) and provided additional training on TB screening to 186 clinicians. The project also carried out monthly supportive supervision and mentoring visits, and convened cluster-based review meetings to monitor and improve the implementation of the HL HFs initiative, including CXR screening.

RESULTS AND ACHIEVEMENTS

Between October and December 2022, the HL HFs initiative showed promising results at the 20 selected HL HFs compared to all other HFs supported by the project (1,344 HFs, including hospitals and health centers). When we compared the results of HFs where the HL HFs initiative was implemented against project-supported HFs without the initiative:

- More visitors were screened at HFs with the initiative (92.8% vs. 88.3%—a 4.8% increase)
- Presumptive TB case identification was much higher at the HFs with the initiative (4.8% vs. 1.4%—a 71% increase)
- TB case diagnosis was much higher at HFs with the initiative (0.57% vs. 0.1%—an 82% increase)
- TB case notification rate per 100,000 OPD visitors was much higher at HFs with the initiative (525.8 vs. 85.4—an 84% increase) (figure 3)

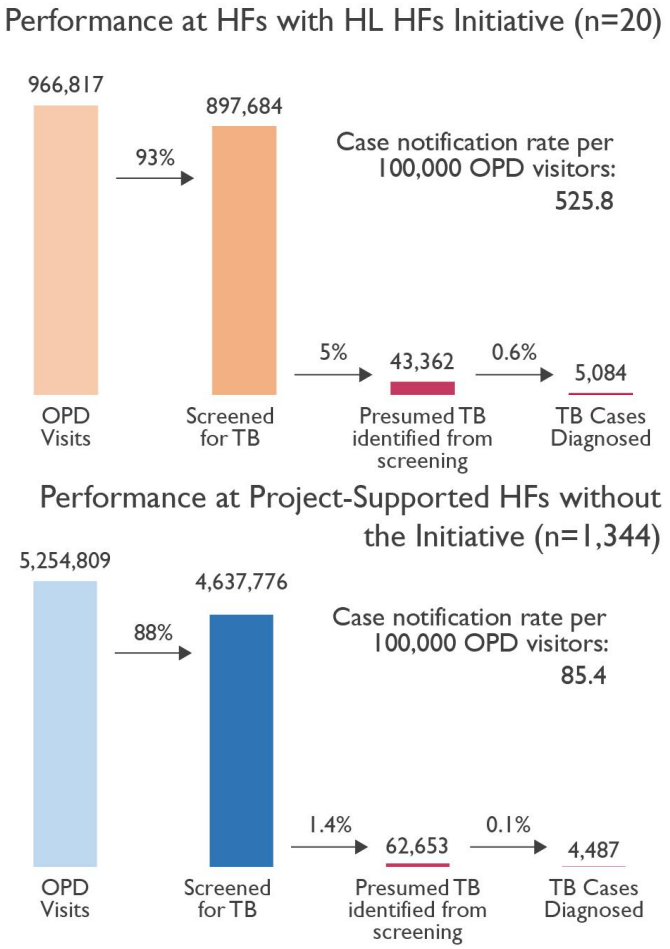

Figure 3. Performance of HFs with the HL HFs initiative compared to project-supported HFs without the initiative, October–December 2022

The 10 selected HL HFs implementing CXR for TB screening identified 2,252 asymptomatic TB cases among HRGs, of whom 11.3% (254) had abnormal CXR and 8.8% (198) were diagnosed with TB. Most of these were clinically diagnosed pulmonary TB (PTB) at 78.8% (156) (table 2).

Table 1: Results from formative assessment: Missed opportunity of TB service delivery at six HL HFs, January–March 2021

				TB diagnosed					
Regions	# CXR requested	# CXR suggestive of TB	% CXR suggestive of TB	Bacteriologically diagnosed PTB	Clinically diagnosed PTB	Extrapulmonary TB (EPTB)	DR-TB	# total TB cases	% total TB cases
SNNP	1,914	163	8.5	15	140	8	0	163	8.5
Amhara	215	24	11.2	11	5	2	0	18	8.4
Oromia	123	67	54.5	5	11	0	1	17	13.8
Total	**2,252**	**254**	**11.3**	**31**	**156**	**10**	**1**	**198**	**8.8**

CHALLENGES

The absence of registers in all service outlets at the selected HL HFs resulted in failure to capture TB screening activities in some units such as IPDs. In addition, competing priorities made it difficult for the busy HCWs to complete the data entry of CXR screening and diagnosis.

LESSONS LEARNED AND WAY FORWARD

The HL HFs initiative, including the piloting of CXR to improve the quality of screening, contributed to the decrease in missed TB cases and reduced transmission within the community. This initiative has also contributed to the additional 10–15% of identified TB cases at the HL HFs participating in the initiative, where CXR identified 16% of infectious TB cases. Therefore, the success of this initiative could lead to a meaningful increase in TB case identification if implemented on a broader scale.

Engaging stakeholders from the outset, focusing the intervention in HL HFs, sensitizing management and HCWs on how to enhance TB case detection, standardizing the TB care pathway, integrating TB services at each service delivery point, and using more sensitive tools like CXR have significantly enhanced TB case detection. The feasibility of using CXR as a screening tool to detect TB among asymptomatic HRGs is fundamental for policy makers to warrant free CXR services as per the National Guideline.

We therefore recommend that the National TB, Leprosy, and Other Lung Diseases Desk (NTBLLD) cascade the HL HFs initiative to all regions. Based on the above findings, we also recommend that the NTBLLD, in collaboration with partners, develop a policy brief and guidance on how to ensure free CXR services for HRGs as indicated in the National Guideline. However, cost-effectiveness and commitment to these initiates need to be investigated.

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