



TECHNICAL BRIEF



credit: Dai Tran

Integrating Service Delivery for TB and Diabetes Mellitus – An Innovative and Scalable Approach in Ethiopia

PROJECT CONTEXT

The burden of non-communicable diseases (NCDs) in low-income countries is expected to rise from 47% in 1990 to 69% in 2030, and diabetes mellitus (DM) accounts for a significant proportion of this increase.¹ Recent global estimates show that close to 300 million people were living with DM in 2010, of which, about 7 million developed the disease during that year alone. The projected number of DM cases for 2030 is more than 400 million with about 30% of the prevalent cases expected to occur in low and middle income countries (LMIC). Simultaneously, both tuberculosis (TB) and human immunodeficiency virus (HIV) epidemics continue to be major public health problems in those same settings. As DM and TB share similar risk factors, it is believed that the slightest interaction between the two diseases could result in devastating consequences. Several studies revealed higher rates of TB among patients with DM compared to those without. Moreover, patients with DM present with atypical clinical features of TB, which poses diagnostic challenges for clinicians. Also, TB treatment failure and relapse appear to be higher in diabetic patients. Similarly, there is some evidence that people living with HIV (PLHIV) are at increased risk of various NCDs including DM.

Ethiopia, with a population of about 90 million, is on the World Health Organization (WHO) list of high TB burden countries. According to estimates by the International Diabetes Federation (IDF) in 2013, about 1.8 million adult people between the ages of 20 to 79 live with diabetes in Ethiopia, an estimated prevalence of 4.36%.

As part of the effort to address these challenges, the WHO, in collaboration with the International Union against Tuberculosis and Lung Disease (IUATLD) has developed a global framework for collaborative activities against the two diseases. This guidance represents a major step in fostering collaboration between disease control programs for NCDs and communicable diseases (CDs). However, there is limited progress with the translation of the global guidance into action. Part of the reason for the delay in implementation of the global recommendations is lack of experience in delivering integrated services. Our objective was to demonstrate the feasibility of providing integrated clinical care for DM, TB, and HIV in general public hospitals in Ethiopia.

ETHIOPIA

STRATEGIC APPROACH

This project was implemented as part of Management Sciences for Health’s (MSH’s) Innovation Challenge Fund (INCH)² initiative designed to encourage innovative interventions across MSH supported projects. MSH used the ExpandNet Framework³ to scale up the innovation.

To ensure the creation of the right environment for scale up of the innovation, the team worked with the Ministry of Health and local health authorities to establish a scale up working group. A key role of the working group was to

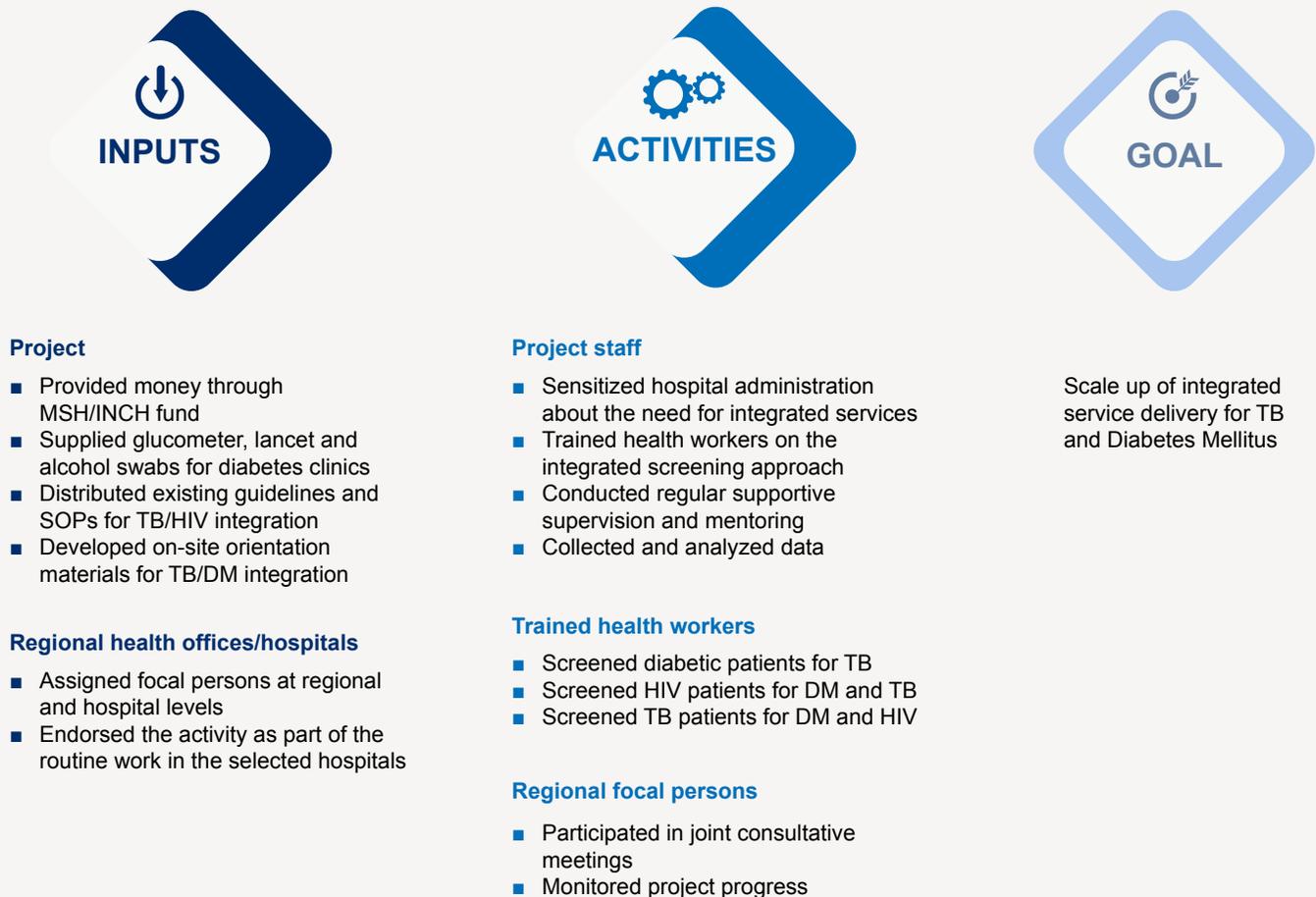
Summary attributes of a successful innovative project according to the ExpandNet framework. According to this framework, a successful innovative project should exhibit the following attributes: (a) Credible - it will be accompanied by evidence that the integrated approach improved the intended outcome; (b) Observable - potential users can see the result; (c) Relevant - the innovation sharply addresses the felt problem; (d) Has relative advantage over alternative approaches; (e) Easy to understand; (f) Compatible with local policy context; and (g) Testable in other settings before further scale up.

ensure that integrated services were being delivered at the sites through regular review and monitoring of site activities (Figure 1). At the same time, the team supported the expansion of the innovation to more sites (horizontal expansion), and added

other components (e.g., screening for other NCDs such as hypertension).

The working group made sure that integrated services were happening at the sites through regular review and monitoring of site level activities.

FIGURE I. Integrated service delivery for TB and Diabetes Mellitus



PROJECT IMPLEMENTATION

We implemented the pilot phase of this project from February - June 2015. Based on the actual caseload and need for integrated services, we selected four hospitals – two from the Amhara region (Debreberhan and Debre Tabor) and two from the Oromia (Bishoftu and Shashemene) region. At each hospital, we provided on-site orientation on how to identify and manage/refer clients for the three diseases to one focal person who was responsible for site level coordination, and three clinicians working in TB, antiretroviral therapy (ART), and diabetes clinics in the two regions. Clinicians in ART clinics screened patients both for DM and TB. Those in TB clinics screened patients for HIV and TB, and patients attending diabetes clinics were screened for TB. We provided minor supplies, mentoring support and monitored the progress during monthly visits to the hospitals using standardized checklists.

For TB screening in DM and HIV clinics, we adapted and used the screening checklist for PLHIV. Symptomatic patients were offered further diagnostic tests based on the symptoms and availability. Sputum microscopy was the preferred method of diagnosis for patients with productive cough. Chest radiography was available for patients upon clinician's recommendation.

We used two symptom-based screening tools for initial screening followed by a blood test. The first step involved using risk scoring

system adapted from a published literature (Table 1). Age, family history, hypertension, waist circumference, alcohol intake, and smoking were used to build a scoring system. Scores for the individual variable ranged from 0-3 with the cut-off point of the total score being 5. Patients with a score of 5 or more were considered “high risk” groups.⁴ Regardless of the risk scoring value, the clinic nurse administered a checklist of clinical symptoms developed by our team,

and categorized the patients as being “symptomatic” or “asymptomatic.” The clinic staff also administered either a Fasting Plasma Glucose (FPG) or Random Plasma Glucose (RPG) test using a glucometer. Patients in DM clinics received FPG tests because they take their anti-TB medications before eating breakfast, while those in ART clinics received RPG tests. An FPG of greater than or equal to 126 mg/l or RPG of 200 mg/dl was considered suggestive of DM.

TABLE I. Diabetes Risk Scoring System

DIABETES RISK SCORING		
Family history of diabetes (any of parents or siblings)		Score
No	1 []	0
Yes	2 []	1
Age group		
<35 yr	1 []	0
35-44 yr	2 []	2
>=45 yr	3 []	3
Hypertension (currently on medication or bp>=140/90)		
No	1 []	0
Yes	2 []	1
Waist circumference in CM (taken below ribs, usually at umbilicus)		
(Men/women)		
<84/77	1 []	0
85-89.9/77-83.9	2 []	2
>=90/84	3 []	3
Current smoking		
Never or ex-smoker	1 []	0
Current smoker	2 []	1
Alcohol on a daily basis (irrespective of the type)		
Never or <1 drink per day	1 []	0
1-4.9 drinks per day	2 []	1
>=5 drinks per day	3 []	2
Total score == _____ [add values for 19 thru 24]		
>=5 points	1 []	
<5 points	2 []	

RESULTS AND ACHIEVEMENTS

A total of 3,439 patients were screened and treated, including 888 from DM clinics, 439 patients with TB, and 2,112 patients in HIV clinics (Table 2). The results show that the yield of TB among patients with DM was about three times the estimated prevalence in the general population of Ethiopia, but over 83% of these were already detected and managed by the existing health system. In contrast, about a third of TB patients had abnormal blood sugar, which is suggestive of DM, but the existing health system detected only 3.5% of these cases.

Given the achievements of this work, a stakeholder consultative meeting was held in May 2015 in Adama to review the project’s implementation progress. Participants included clinicians from participating hospitals, representatives of

TABLE 2. Summary Information about the Project Beneficiaries

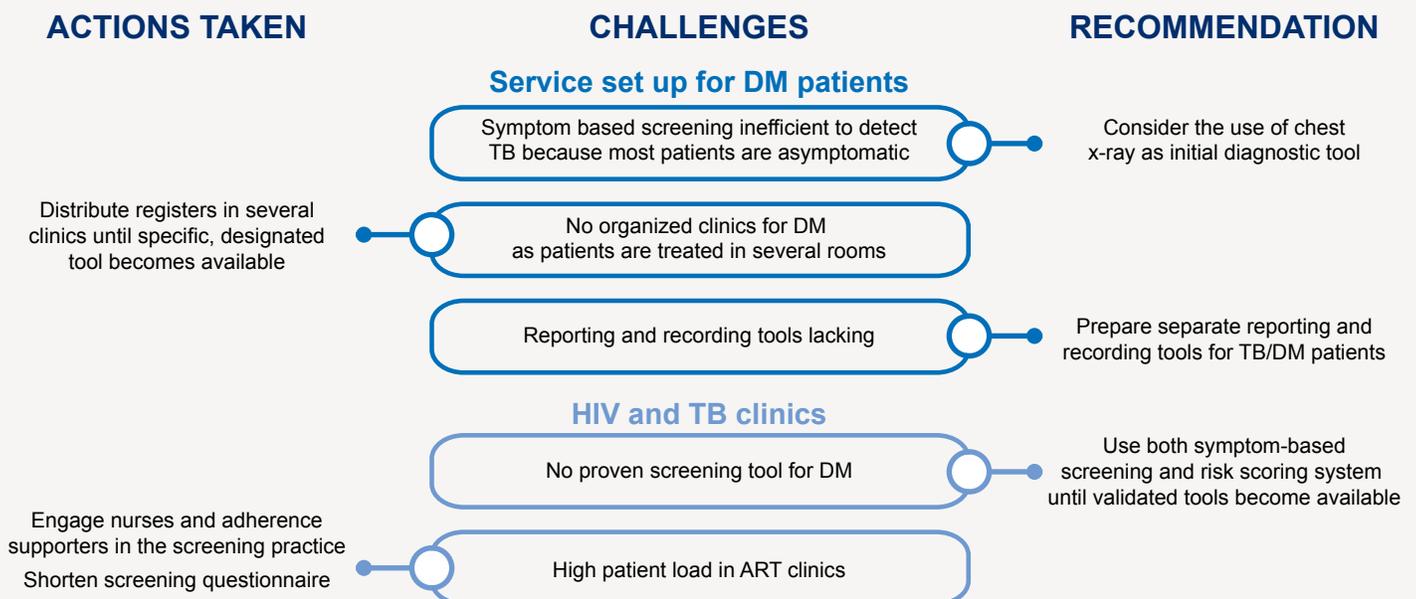
DM clinic	
Total screened for TB	888
Number (%) diagnosed with active TB	6 (0.7)
TB clinic	
Total screened for DM	439
Number (%) with FPG \geq 126 mg/dl	141 (32.4)
Co-infected with HIV	49 (12.5) ^a
HIV clinic	
Total screened for DM	2112
Number (%) with RPG \geq 200mg/dl	31 (1.5) ^b
Number (%) co-infected with TB	316 (15.8) ^c

^a Out of 392 who received HIV test; ^b Data were missing for 37; ^c Data were missing for 114

regional health bureaus and MSH technical teams. A strong sense of local ownership, provision of minor supplies (glucometer, lancet, anti-septic swabs, etc.), regular mentoring and supervision, and clinicians’ interest in gaining new

knowledge and experience were key factors contributing to successful implementation of the innovation. However, several challenges were identified with suggested recommendations or corrective actions were taken (Table 3).

FIGURE 2. Actions and recommendations to further integration of TB-DM services



Acknowledgements

Thank you to all of the staff from Challenge TB Ethiopia for their support in the development of this technical brief.

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WAY FORWARD

Lessons from this project have been shared at several other national and international conferences including a roundtable discussion at the 46th Union World Conference on Lung Health in Cape Town, South Africa, in 2016, an MSH-organized symposium at the same conference a year later in Liverpool, England, and in 2017 at the annual conference of the Ethiopian Medical Association under the theme “Tuberculosis and Diabetes: A Looming Co-Epidemic and Lessons Learned from TB/HIV Collaboration in Ethiopia.” Additional lessons on the nationwide scale up strategies will be shared in 2017 at the 48th Union World Conference on Lung Health in Guadalajara, Mexico.⁵

Through the catalytic role that MSH plays both in Ethiopia and globally,

TB/DM integration is a top priority for the national TB program in Ethiopia. The activities initiated under the MSH/INCH are now fully integrated within the activities of the national TB program and adequate budget is allocated through the USAID/Challenge TB project. Clinician orientation materials have been more standardized and clinicians from more than 42 hospitals have been trained. More results are expected in the coming years.

Integrated delivery of TB/HIV and DM services is feasible in settings with limited resources. The approach should be scaled up in settings with dual or triple burden of these diseases. Lessons from the scaled up implementation of the approach should be shared widely.

References

- 1 Marais, B. J., et al. (2013). “Tuberculosis comorbidity with communicable and non-communicable diseases: integrating health services and control efforts.” *Lancet Infect Dis* 13(5): 436-448.
- 2 The MSH Innovation Challenge (INCH) Fund seeks to identify promising innovations in field projects that have the potential to improve health outcomes, and help replicate and scale tools, models and approaches that have proven successful.
- 3 WHO/ExpandNet. Nine steps for developing a scaling up strategy. WHO 2010. Available at: http://www.who.int/immunization/hpv/deliver/nine_steps_for_developing_a_scalingup_strategy_who_2010.pdf?ua=1
- 4 Lee YH, Bang H, Kim HC et al. A simple screening score for diabetes for the Korean population: development, validation, and comparison with other scores. *Diabetes Care* 2012;35:1723–30.
- 5 TB and diabetes mellitus in high burden settings: implementation and research experiences from Asian, African, Caribbean and Latin American countries. Available at <https://www.professionalabstracts.com/theunion2017/programme-theunion2017.pdf>

The Global Health Bureau, Office of Health, Infectious Disease and Nutrition (HIDN), US Agency for International Development, financially supports this publication through Challenge TB under the terms of Agreement No. AID-OAA-A-14-00029 This publication is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of Challenge TB and do not necessarily reflect the views of USAID or the United States Government.