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HEALTB CURING TB, SAVING LIVES

HELP ETHIOPIA ADDRESS LOW TB PERFORMANCE (HEAL TB) PROJECT 2011-2016

THE HELP ETHIOPIA ADDRESS LOW TB PERFORMANCE (HEAL TB) Project,

funded by the U.S. Agency for International Development (USAID) and led by Management Sciences for Health (MSH), strengthened TB services in **28 zones in Amhara and Oromia Regions.** The U.S. President's Emergency Plan for AIDS Relief (PEPFAR) also contributed funds.

HEALTB's other implementing partners were PATH, All Africa Leprosy Tuberculosis and Rehabilitation Training Center (ALERT), and Kenya Association for the Prevention of Tuberculosis and Lung Diseases (KAPTLD).

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USAID/HEAL TB EXCEEDED EXPECTATIONS TO BRING TB SERVICES TO 55 MILLION PEOPLE IN THE AMHARA AND OROMIA REGIONS. HERE ARE THE NUMBERS.

rom 2011–16, the HEAL TB project supported Ethiopia's Federal Ministry of Health (FMOH) in Amhara and Oromia regions to improve comprehensive TB services, including finding and treating TB in children, adults, and special populations; expanding multidrug-resistant TB (MDR-TB) diagnosis and treatment; integrating TB and HIV services; improving laboratory diagnostics and reporting; and strengthening the expertise, leadership, and management of the health system.

The project far exceeded virtually all initial targets. Begun in 10 zones, HEAL TB increased in scope to 28 zones—covering all of Amhara and Oromia regions. The dramatic scale-up brought high-quality, comprehensive TB services to nearly 55 million people—more than half the country's population.

All numbers in this report refer to project-supported work in Amhara and Oromia Regions unless otherwise indicated.

INNOVATIVE STRATEGY LEADS TO EXTRAORDINARY RESULTS

The FMOH and project partners, with additional guidance from USAID/Ethiopia, achieved this scale-up thanks to an innovative model of technical assistance. Rather than work with health facilities directly, HEAL-TB's technical experts relocated to zonal health department offices, where they trained and closely mentored zonal and *woreda* TB experts and officials, who in turn trained and monitored the facilities. This cascade of expertise not only ensured substantial local expertise, but also saved US\$ 6.4 million in staff, travel, and administrative costs. The strategy and its cost-effectiveness enabled more than 2,200 health facilities to upgrade their TB services, more than double the initial target of 1,000.

HEAL TB also introduced a Standards of Care qualitymeasurement system to guide government health officers on their supervisory visits. Supervisors rate facilities according to standard criteria—so that improvements, and areas needing improvements, are easy to discern.

TARGET NUMBER OF HEALTH FACILITIES TO RECEIVE EQUIPMENT, TRAINING, SUPERVISION, AND MENTORING UNDER HEAL TB

ACTUAL NUMBER OF FACILITIES THAT RECEIVED THE SUPPORT, THANKS TO HEAL TB'S COST-EFFECTIVE TECHNICAL ASSISTANCE MODEL





FINDING TB DISEASE: SCREENING ON AN UNPRECEDENTED SCALE

With the leadership of Amhara and Oromia Regional Health Bureaus, HEAL TB was the first project in Ethiopia to organize systematic TB screening on a large scale. Health providers in project areas now screen for TB every woman, man and child who enters any health facility, no matter the reason. Every new inmate in a prison is screened as well; although not originally envisioned, HEAL TB also trained prison health officials in TB.

The project also trained more than 20,000 health extension workers to bring TB screening and treatment into the community. And members of "health development armies," who report to the extension workers, bring detection and treatment services right to the home.

Also at the community level, HEAL TB worked with FMOH to expand Directly Observed Treatment, short course (DOTS) at health posts, so patients need not travel long distances for treatment. By the end of the project, 41 percent of health posts were offering DOTS, up from 12 percent at baseline.

In hard-to-reach, pastoralist areas, HEAL TB trained HEWs to make sputum smears and transport the slides to health centers—so the slides make the difficult journey, rather than the people. In half a year, health workers transported slides for nearly 900 presumptive TB cases among pastoralists. Of the 900 people, 10 percent were diagnosed and treated—10 times the average in non-pastoralist areas.

Health workers perform contact screening for every patient detected. Of more than 100,000 contacts screened, nearly 1200 were diagnosed with TB and put on treatment—six times the estimated national prevalence.

250,000 PEOPLE WITH TB IDENTIFIED AND PUT ON TREATMENT

W OVERALL TREATMENT SUCCESS RATE

6 MILLION PEOPLE SCREENED FOR TB



TREATING AND CURING TB: EXCEEDING INTERNATIONAL NORMS

The key to treatment success is to make sure patients start DOTS immediately after diagnosis—and stay on it until completion. Much depends on the skill of TB health workers. HEAL TB trained more than 5,000 TB focal persons in comprehensive management of TB, including DOTS, counseling for patients, contact screening, and reporting. In addition to formal training, all focal persons benefited from ongoing support and coaching by zonal and *woreda* TB experts. The overall project level treatment success rate (TSR) was 95 percent. The overall project cure rate reached 91 percent; both figures exceed national and international targets.

The project increased treatment success rates by phases, starting with a cure rate as low as 55 percent, as shown in the figure below.



9% OVERALL CURE RATE

AT HEALTH FACILITIES SUPPORTED BY HEAL TB

OFTEN OVERLOOKED PATIENTS: TB IN CHILDREN

The HEAL TB project trained health workers in the more ambiguous symptoms of childhood TB. Intensive screening, contact screening, and improved diagnostics contributed to the fact that children under 15 years represented over 12.5 percent of all detected TB patients—a proportion exceeding international rates (10.4 percent according to the WHO, 2015).

HEAL TB also assisted the FMOH to integrate TB screening in pediatric wards and maternal and child health clinics. In addition, the project piloted gastric aspiration for GeneXpert diagnosis of children. Out of 86 children with presumptive TB who had gastric aspiration performed to get a good sample, 29 percent were diagnosed with TB— a high diagnostic yield.

Contact screening proved a useful entry to finding children under five with presumptive TB, who could then be diagnosed. According to international best practice, contacted under-fives without signs of TB should be immediately placed on preventive therapy (IPT). The proportion of eligible under-fives on preventive treatment in project areas jumped from none at baseline to over 50 percent in year five, and continues to climb.

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2.5% TB PATIENTS WERE UNDER 15 YEARS OLD

UNDER-FIVE CONTACTS SCREENED



IMPROVING TB DIAGNOSIS BY STRENGTHENING LABORATORIES

With its cost-effective strategy of placing HEAL TB experts in zonal health departments instead of their traveling to individual health facilities, the project saved US\$ 6.4 million—some of which went to rehabilitating and procuring laboratory equipment.

HEAL TB also introduced large-scale, external quality assurance (EQA) of sputum smear microscopy through blind rechecking. At the project's start, only four specialized, regional laboratories offered sporadic quality control. HEAL TB helped implement the Ethiopian Public Health Institute's (EPHI) strategy for decentralized external quality assurance (EQA) to hospital labs to reach the fastexpanding health facilities. By 2016, over 100 hospital laboratories were able to provide external quality assurance. Now the 1,650 diagnostic facilities in the two regions receive EQA by random blind rechecking each quarter for Ziehl-Neelsen and LED microscopes—an extraordinary achievement. These checks show that false negative and positive results have dropped to 5 percent and 0.2 percent, respectively—comparable with leading labs internationally.

650 HEALTH FACILITIES PARTICIPATE IN QUARTERLY EXTERNAL QUALITY ASSURANCE FOR SPUTUM MICROSCOPY GENEXPERT CENTERS FOR DIAGNOSIS 20 GENEXPERT MACHINES PROVIDED

39, 16 SPUTUM SAMPLES TESTED BY GENEXPERT DIAGNOSTIC EQUIPMENT

LABORATORY TRANSPORTATION AND REPORTING

Transporting samples to distant labs and reporting results back in a timely manner have long been a challenge. To improve the sample-referral linkage in the two regions, US-AID/HEAL TB in consultation with FMOH, the EPHI and regional counterparts:

- purchased eight vehicles and installed custombuilt cold chain capacity, so that sputum for cultures and GeneXpert diagnosis, as well as other samples like plasma for viral load, can be transported swiftly and without loss of quality;
- developed an online e-Specimen system to track sample pick-up and delivery, and communicate results, so lab results can arrive instantly;
- employed and trained transporters to shepherd and track lab samples for both HIV and TB patients using the same cold-chain vehicles for efficiency. Implementation of the sample-transport system will be transitioned to the new USAID/Challenge TB activity for further implementation.

CONTROLLING MULTIDRUG-RESISTANT TB

When HEAL TB started, only one facility in Amhara and Oromia could treat MDR-TB, and only two labs could diagnose it (but with solid culture, which takes eight weeks). Hundreds of people languished on waiting lists for treatment.

Today 24 hospitals can treat and care for MDR-TB patients, including providing psychosocial and nutritional support. HEAL TB helped the FMOH build, furnish, and equip three of these centers and provided technical support to all.

The treatment success rate for MDR-TB patients in project areas increased to 75 percent, with cure rates at 65 percent.

Rigorous mentoring by experienced clinicians, engagement of hospital management in patient care and scrupulous follow-up of patients are key to this high success rate among MDR-TB patients. Staff at all 2,100 DOTS facilities can now identify presumptive MDR-TB. Health workers send sputum of those with presumptive MDR-TB for GeneXpert diagnosis, culture, and drug-sensitivity testing. If diagnosed with MDR-TB, patients are admitted to one of the 24 MDR-TB facilities for up to eight weeks before being discharged to the care of their local health center. If the patient lives close to an MDR-TB center, they can start with ambulatory care. Patients return to the MDR-TB hospitals for checkups and lab tests each month for a year—all coming on the same day for efficient use of staff time. Patients are counseled, provided with food supplies, and immediately reimbursed for transport. After the first year, they return regularly but less frequently for up to another 16 months.

Since contact screening is especially important for MDR-TB, the project assisted FMOH to expand the practice to the more than 300 follow-up centers. From 342 MDR-TB index cases treated in two years, the project enabled FMOH to screen nearly 1,000 contacts (95.3 percent). Of the contacts, two were found to have drug-susceptible TB—and 17 had MDR-TB. This yield represents an MDR-TB detection rate nine times the national prevalence estimate.



927 PATIENTS TREATED FOR MDR-TB, 2011 TO 2016

65% CURE RATE AND 75% TREATMENT SUCCESS RATE FOR MDR-TB

Through the combined efforts of the Ethiopian Federal Ministry of Health, USAID, and the HEAL TB partners

55 MILLON Ethiopians now have access to



high quality TB services in HEAL TB-supported regions





Health facilities with stock-outs of TB drugs 2011–2016

PHARMACEUTICAL MANAGEMENT GETTING AND TRACKING SUPPLIES

The massive screening program created hundreds of thousands of samples to diagnose, which required huge quantities of laboratory supplies. The 250,000 patients diagnosed with the disease then needed a large and reliable supply of drugs. To meet these and other challenges, the project provided intense capacity-building

and technical support to the Pharmaceutical Fund and Supply Agency and health officials at all levels, to improve the regions' Integrated Pharmaceutical Logistics System (IPLS).

It worked: Facilities that experienced one or more days of stock-out a quarter decreased from 22 percent at baseline to less than 2 percent by 2016 in project areas (see figure above).

TREATING PATIENTS WITH CO-INFECTION: TB/HIV COLLABORATION

HIV patients face significantly higher risk of developing TB. Integrating TB and HIV interventions means that those with known HIV get screening and if necessary treatment for TB, and vice versa. Through its comprehensive support package of training, mentorship, and monitoring, HEAL TB assisted FMOH to test all TB patients for HIV.

Those found to be HIV positive were immediately started on antiretroviral therapy (ART).

The rate of HIV testing for TB patients improved from baseline figures of 69 and 85 percent (in the first and second-phase zones, respectively) to more than 95 percent.

% TB PATIENTS TESTED FOR HIV IN THE PROJECT AREAS

TB PATIENTS FOUND TO HAVE HIV STARTED ON ART

IMPROVING LEADERSHIP, MANAGEMENT, AND TECHNICAL EXPERTISE

HEAL TB supported the training of 27,000 health workers in TB management, many of them in multiple technical skills. The project introduced a "blended learning" training system, which integrates reading material with short-duration classroom training. Operational research showed that the less-expensive blended training is equally as effective as longer-term classroom work, and it decreases the number of days for a trainee to be absent from work. In addition, HEAL TB provided ALERT with video-conferencing equipment to link 500 *woreda*-based facilities for blended trainings. The video-conferencing pilot showed similar results to traditional classroom training as well. HEAL TB staff also mentored district health officials so that they can offer effective supportive supervision and help practitioners continue to improve their skills.

In the interest of sustainability, HEAL TB trained 66 biomedical technicians in preventive maintenance and repair of laboratory and other equipment, and provided them with maintenance kits, so no equipment need be idled. As part of their training, technicians salvaged and repaired many older machines—from microscopes to X-ray equipment—saving the FMOH an estimated US\$ 1.2 million in equipment costs.



27,000 HEALTH WORKERS TRAINED IN TB SERVICES, MANY IN TWO OR MORE SKILL AREAS

2 MILLON US\$ SAVED BY SALVAGE OF EQUIPMENT BY BIOMEDICAL TECHNICIANS



HEALTH FACILITIES NOW HAVE AN ACTIVE INFECTION-CONTROL COMMITTEE



KEEPING OTHERS HEALTHY: INFECTION CONTROL IN HEALTH FACILITIES

Vigorous infection control is vital to protect both health staff and community members. As of the latest available quarterly report, 73 percent of all health facilities in project areas had organized a committee dedicated to TB infection control (from a baseline of 25–30 percent, depending upon the phase). And 70 percent had developed an infectioncontrol plan (baseline 19–22 percent). Even more— 72 percent of health facilities—were fast-tracking patients with a cough (performing triage) so they can be served and released as quickly as possible.

PRODUCING RELIABLE DATA

At baseline, nearly 20 percent of health facilities were either under- or over-reporting the number of people with TB. With HEAL TB's technical support, this number dropped to less than three percent, exceeding international standards. HEAL TB worked closely with regional, zonal and *woreda* TB focal persons as well as health facility staff to improve data quality.

72[%] HEALTH FACILITIES THAT PRIORITIZE COUGHING PATIENTS



SHARING THE WEALTH OF EXPERTISE: INNOVATING AND RESEARCHING FOR CONTINUOUS IMPROVEMENT

Perhaps the most important of HEAL TB's many innovations is its technical assistance model based on a cascade of expertise. Project experts intensively coached zonal and local TB experts and officials, who then passed along their expertise to facility personnel, and continued monitoring and coaching. This extremely effective and efficient model not only allowed the project to more than double its scope: it also ensured that TB expertise remains firmly rooted in the Ethiopian health system.

HEAL TB introduced a "Standards of Care" tool to guide government health officers on their monitoring visits. The Standards of Care indicators make it easy for both supervisors and facilities to discern areas needing improvements as well as progress made, forming a basis for coaching and correction as necessary. Supervisors now monitor all facilities each quarter, using the Standards of Care. Twenty peer-reviewed articles produced by HEAL TB staff have been published in international scientific journals or are in the process of publication as of mid-2016. These papers describe the project's operational research to evaluate methods and continually improve them. They form part of the project's contribution to global health knowledge.

In addition to peer-reviewed articles, HEAL TB personnel have presented more than 70 abstracts at national and international conferences, including the Ethiopian TB Research Advisory Committee (TRAC) conference, the African Society of Laboratory Medicine, and the international Union World Conference on Lung Health.

IN ALL, HEAL TB PARTNERS INTRODUCED OVER 15 INNOVATIONS IN CAPACITY BUILDING AND TB SERVICES, INCLUDING:

- Blended learning
- Health-facility supervision and mentorship by *woreda* and zonal TB focal persons
- Model DOTS centers
- MDR-TB clinic days
- Standard of Care tool
- Implementation of decentralized, external quality assurance

- Gastric aspiration for diagnosis of childhood TB, introduced in Ethiopia
- Slide referrals instead of person referrals in pastoral areas of Ethiopia
- Purpose-built, small vehicles with coldchain capability for sample transport
- A regular bulletin for heath extension workers, for continuing TB education
- Quarterly performance review of all health facilities by woreda TB officers and zonal health department managers

RESEARCH ARTICLES PUBLISHED OR SOON TO BE PUBLISHED



HEAL TB demonstrated many ways that technical assistance and capacity-building can provide measurable and lasting results.

CONCLUSION AND LESSONS LEARNED

HEAL TB demonstrated many ways that technical assistance and capacity-building can indeed "Help Ethiopia Address Low TB Performance"—as the project's full name requested. Above all, the model that HEAL TB developed for cascading expertise—from project technical advisor to zonal and woreda TB focal point, to health-facility staff—proved effective and economical. It is also likely to be sustained since the expertise now belongs to FMOH officers, as do the training manuals and Standards of Care tool the project created.

- The blended-learning approach to training that HEAL TB pioneered—using model DOTS centers as hands-on training sites, plus the project-developed video-conferencing facility, limiting participants' time away from work, and requiring participants to make headway with manuals on their own—proved as effective as traditional trainings, but less costly. The project worked with FMOH and the Ethiopian Food, Medicine and Health Care Administration and Control Authority to accredit all TB trainings, another indication that the blended learning approach will be used long-term.
- Contact screening has proved a useful entry point to identify children at risk of TB and get them treated or put on preventive therapy when appropriate. In addition, diversifying diagnostic techniques has improved the outlook for treating children. Using gastric and nasopharyngeal aspirates for GeneXpert and improved X-ray diagnostics should be an area of focused support. Introducing tele-radiology in Ethiopia, where there are few radiologists, would be a welcome addition to the country's TB program.
- The sample-transport system developed by the project will, when fully implemented, help the country create hub centers for major lab tests, while maintaining sample quality and timely delivery.

- Improved quantification and scheduled distribution of TB drugs has resulted in avoiding stock-outs of drugs, and the improvements in the Integrated Pharmaceutical Logistics System (IPLS), if maintained and expanded would be of benefit nationwide.
- Making TB treatment easier for the patient to start and maintain has contributed to the project's excellent treatment success rate. Many patients now receive medications at their local health post, eliminating the travel burden that might otherwise entice them to drop out of treatment. For MDR-TB patients, the mixed ambulatory and inpatient model of care, coupled with the monthly follow-up clinic day, has improved both access and quality of MDR-TB services.
- Integration between HIV and TB services ensured that TB patients receive vital ARVs, and HIV patients receive equally vital TB treatment—not only for the benefit of the patient but also to help reduce the prevalence of MDR-TB. Close monitoring of the *woreda* TB focal persons, using the Standards of Care, is one reason for the improvement in HIV/TB integration of services.

Finally, none of the extraordinary results of HEAL TB would have happened without the profound commitment, hard work, and productive collaboration of all parties. For going above and beyond expectations, HEAL TB would like to thank the Government of Ethiopia, particularly the FMOH and its sub-agencies, the Regional Health Bureaus, health facility and extension workers of Oromia and Amhara Regions, our collaborating partners, and USAID and the American people. Together, these stakeholders made the project a success and a model for the rest of Ethiopia and beyond. ◆



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