

**SUPPLEMENT: THE ETHIOPIAN OR INITIATIVE****Poor symptomatic tuberculosis screening practices in a quarter of health centres in Amhara Region, Ethiopia**G. B. Gebregergs,^{1,2} M. Alemneh,³ D. N. Koye,⁴ Y. Kassie,⁵ M. Assefa,⁶ W. Ayalew,⁷ C. Temesgen,⁸ E. Klinkenberg,^{9,10} T. Tadesse⁴<http://dx.doi.org/10.5588/pha.14.0053>

Setting: In 2011, Ethiopia introduced a strategy of symptomatic tuberculosis (TB) screening for patients attending out-patient services to increase identification of presumptive TB.

Objective: To assess implementation and factors affecting symptomatic TB screening at out-patient departments in health centres in the Amhara Region, Ethiopia.

Design: Using a cross-sectional study design, 86 randomly selected public health centres providing DOTS were included in the study. Data were captured by reviewing TB registers and interviewing key informants at out-patient services.

Results: Of 86 health centres, 24 (28%) had poor symptomatic TB screening practices, defined as screening <80% of attending out-patients. Having an actively functioning multidisciplinary health centre team to assess TB services (aOR 2.29, 95%CI 1.23–30.80) and partner support for TB activities (aOR 4.84, 95%CI 1.05–22.40) were associated with higher TB screening rates, whereas availability of antiretroviral therapy was negatively associated. In all health centres combined, 1.6% of out-patient department attendees were identified as having presumptive TB.

Conclusion: A quarter of health centres had poor symptomatic TB screening practices in the out-patient services in this study. Strengthening multidisciplinary teams and expanding partner support are recommended to improve TB screening practices at out-patient services in Ethiopia.

In 2012, Ethiopia ranked eighth among the world's 22 high TB burden countries.¹ The Ethiopian TB case finding strategy for TB control consists of the detection of TB among all persons presenting to health services with symptoms indicative of TB.² By implementing the DOTS strategy, the country achieved a case detection rate of 64%.¹ The Amhara Region reports a case detection rate of 56%,³ which is below both the international target of 70% and the national average.

In 2011, Ethiopia introduced a strategy to implement symptomatic TB screening for all persons attending out-patient services. This coincided with the introduction of the reformed Health Management Information System out-patient department (OPD) register to capture data on the screening and identification of patients with presumed TB. This strategy was supplemented by the updated national comprehensive training manual for clinical and programmatic management of TB, leprosy and TB-HIV (human immuno-

deficiency virus), which also highlights the need to screen every person visiting a health facility for TB.⁴ There is no published information on the implementation of the strategy in the region or the country at large.

The objective of the present study was to assess the level of implementation and factors affecting symptomatic TB screening among out-patients attending public health centres in the Amhara Region.

STUDY POPULATION, DESIGN AND METHODS

An institution-based cross-sectional study was conducted from 30 September to 18 October 2013 in selected health centres in the Amhara Region, which has an estimated population of 18.9 million, of whom 87% live in rural areas.³ There are 801 health centres in the region; each health centre provides services for on average 25 000 people within a 10 km radius. TB diagnostic and treatment services are provided free of charge at all government facilities. Public health centres providing DOTS services in OPDs were included.

A sample size of 86 health centres was obtained using the single-population proportion formula for finite populations in Open-Epi software (Emory University, Atlanta, GA, USA). We assumed 50% of the health centres to have good TB screening practices on review, with a 10% margin of error and 95% confidence levels.

Of the 10 administrative zones (defined as a group of adjacent districts) in Amhara, five (North Gondar, South Wollo, West Gojam, Awi and Oromia) were purposively selected based on their geographical distribution in the region, population size and accessibility. The 86 health centres were allocated to the selected zones proportionate to the number of health centres. The number of health centres in each zone was then selected using simple random sampling.

Data were collected using interviews with OPD case managers, record reviews (OPD and laboratory registration books) and observation (availability of TB screening job aids). A pre-tested structured questionnaire was used to assess the profile of the health centres, health professionals and TB screening-related variables for the period from 1 April to 30 June 2013. Data collectors were experienced health professionals trained and supervised by the study team during data collection.

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KEY WORDS

case finding; implementation; out-patients

Received 24 May 2014
Accepted 19 August 2014

PHA 2014; 4(4): S8–S12
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TABLE 1 Operational definitions

The following definitions were used:

Functioning multidisciplinary team: clinic team composed of ART pharmacist, ART officer, ART nurse, TB focal person, laboratory personnel, OPD case team leader, counsellors, prevention of mother-to-child HIV transmission focal person, infection prevention officer, ART adherence case manager and head of health centre who meet every 2 weeks to discuss TB and HIV issues; minutes of meetings are kept
Infection prevention committee: team consisting of representatives from each service delivery unit that meets every 2 weeks to discuss overall infection prevention and control, including TB infection control, and keeps minutes of meetings
Patient overload: average number of patients per OPD room exceeds 24/day
Presumptive TB case: any person who presents with symptoms and/or signs suggestive of TB, in particular, cough of ≥ 2 weeks and/or constitutional symptoms (loss of appetite, weight loss, fever, night sweats and fatigue)
Regular supervision by <i>woreda</i> health office: at least monthly supervision visits to health centres by <i>woreda</i> health officers
Review meeting: a quarterly meeting conducted to evaluate performance against quarterly plan and recommendations made by health centres, <i>woreda</i> health office, the zonal health department and the regional health bureau, partners and other stakeholders
Symptomatic TB screening practice: considered good if a health centre screened $\geq 80\%$ of all OPD attendants for TB during the study period
TB training: training of OPD staff in the previous year on TB, TB-HIV, TB/leprosy or infection prevention
<i>Woreda</i> officers: health professionals assigned at <i>woreda</i> (district) level and responsible for planning, supervising and evaluating health centres in their territory
Written feedback from supervisors: reports outlining strengths and weaknesses of OPD services observed during supervision visits

ART = antiretroviral therapy; TB = tuberculosis; OPD = out-patient department; HIV = human immunodeficiency virus.

Each questionnaire was reviewed and checked for accuracy and completeness by the study team. Epi-Info™ version 3.5.1 (Centers for Disease Control and Prevention, Atlanta, GA, USA) was used for double data entry. STATA version 11.0 (Stata Corp, College Station, TX, USA) and SPSS version 16 (Statistical Package for the Social Sciences, Chicago, IL, USA) statistical packages were used for data analysis. The health centre was used as the unit of analysis, and descriptive statistics were used to determine the proportion of health centres with good screening practice (Table 1) and the yield of the screening. The mean was calculated for normally distributed data, while for skewed data the median was calculated. The association between response and explanatory variables was measured using odds ratios (OR) with 95% confidence intervals (CI) obtained from multivariate logistic regression analysis.

Ethics clearance was obtained from the Regional Ethical Review Committee of the Amhara Regional Health Bureau (Bahir Dar, Ethiopia). A letter of permission was obtained from each Zonal Health Department and the heads of health centres. Verbal consent was provided by study participants.

RESULTS

Characteristics of health centres

All 86 selected health centres were included in the study. The median number of out-patients seen per day and room was 15.8 (interquartile range 8.2). The median number of OPD rooms per health centre was 2.0, ranging from 1 (33.7% of the health centres) to 5 (2.3% of the health centres). Of the 83 health centres with sputum microscopy services, 13 (15.7%) experienced service interruptions of an average duration of 20 days during the study period.

Fifty-two (60.5%) health centres had an actively functioning multidisciplinary team (MDT) or infection prevention (IP) team, with existing documentation of meetings held. The mean number of meetings in a quarter was 2.7 (standard deviation ± 1.3). *Woreda* officers carried out supervisory visits to 79 (91.9%) of the health centres, and the number of visits ranged from 1 to 8 (median = 1). Supervision was monthly for a quarter of the health centres, while two thirds were irregularly supervised and nearly 10% were not supervised at all in 2012–2013 (Table 2). Seventy-four (86%) health centres had a partner organisation supporting TB activities in terms of supervision (94.6%), training (83.8%), provision of microscope (83.4%) and job aids (33.8%), furniture (28.4%) and other items, such as computers (14.9%). In the study facilities, 24.2% (89/368) of the health professionals had received training in TB or TB-HIV on at least one occasion during the previous year.

Proportion of health centres implementing symptomatic TB screening

Of the 86 health centres, three (3.5%) did not screen OPD patients for TB at all and two (2.3%) documented only bacteriologically confirmed TB patients and not presumptive TB cases; 24 (28%) screened $< 80\%$ of OPD patients. The overall yield of the symptomatic TB screening was 1.6%, i.e., 16 presumptive TB patients/1000 screened OPD patients. The yield differed in centres with good ($\geq 80\%$ screened) and poor ($< 80\%$ screened) screening rates (1.8% and 0.8%, respectively). This difference was significant ($P = 0.002$). Variations in screening practice across the zones were observed. All health centres in the North Gondar Zone screened at least 80% of OPD patients, while health centres in the Awi and West Gojjam Zones screened only about one third of patients (Figure).

ACKNOWLEDGEMENTS

The authors thank TB-CARE I/ US Agency for International Development (USAID, Washington DC, USA) and specifically, its partners KNCV Tuberculosis Foundation (The Hague, The Netherlands) and the International Union Against Tuberculosis and Lung Disease (Paris, France) as well as the Tuberculosis Research Advisory Committee (TRAC) of the Ethiopian Federal Ministry of Health (Addis Ababa, Ethiopia) for providing technical and financial support for the project. We are also grateful to the Amhara Regional Health Bureau (Bahir Dar, Ethiopia) for unreserved help during the data collection process, and the study participants and data collectors for their participation and commitment. The USAID Ethiopia through The Global Health Bureau, Office of Health, Infectious Disease and Nutrition (HIDN), USAID, financially supported this study as part of the Ethiopia operational research (OR) capacity building initiative through TB CARE I under the terms of Agreement No AID-OAA-A-10-00020. This study was made possible by the generous support of the American people through USAID (Ethiopia mission). The contents of this paper are the responsibility of the authors and do not necessarily reflect the views of the USAID or the United States Government. This manuscript is the result of an OR study conducted by the Amhara regional team during their OR training under the TB-CARE I/USAID funded initiative to build OR capacity in Ethiopia. Conflicts of interest: none declared.

TABLE 2 Frequency distribution of health centre characteristics, Amhara Region, Ethiopia, 2013

Variable	n (%)
Availability of job aids for symptomatic TB screening	
Yes	81 (94.2)
No	5 (5.8)
Sputum microscopy available	
Yes	83 (96.5)
No	3 (3.5)
Availability of ART service	
Yes	52 (60.5)
No	34 (39.5)
Functional MDT/IP team	
Yes	52 (60.5)
No	34 (39.5)
Supervision by <i>woreda</i> health officers	
Yes	79 (91.9)
No	7 (8.1)
Provision of supervision feedback	
Yes	69 (80.2)
No	17 (19.8)
Partner support for TB activities	
Yes	74 (86.0)
No	12 (14.0)
Conduct review meeting	
Yes	74 (86.0)
No	12 (14.0)

TB = tuberculosis; ART = antiretroviral therapy; MDT = multidisciplinary team; IP = infection prevention; *woreda* = district.

Factors associated with the implementation of symptomatic TB screening

TB training, availability of antiretroviral therapy (ART), partner support for TB activities, feedback from supervision, supervision, MDT/IP meetings, patient overload and conducting review meetings were investigated for association with good screening practice. In the bivariate logistic regression analysis, screening practice was only significantly associated with MDT/IP meetings. In multivariate logistic analysis, three independent variables (MDT/IP, $P = 0.002$; ART service, $P = 0.028$; and availability of partners, $P = 0.044$) were significantly associated with screening practice.

Health centres with an actively functioning MDT/IP team were 8.3 times more likely to screen $\geq 80\%$ of OPD patients than health centres without a team (Table 3). Health centres with partner support for TB activities were 4.8 times more likely to screen $\geq 80\%$ of OPD patients than health centres without partner support. Screening practice was significantly lower among health centres with ART services: centres without ART service were five times more likely to screen OPD patients for TB.

DISCUSSION

This study showed that 72.1% of the health centres screened $\geq 80\%$ of OPD patients for TB. This supports the finding of a study from Ghana that concluded that systematic active screening of OPD attendees is feasible under programme conditions.⁵ One of the factors significantly associated with good screening practice was holding regular MDT/IP meetings to monitor TB activities. In addition, availability of partners to support TB activities and not having an ART service were also significantly associated with good screening practice at the OPD.

Twenty-four (27.9%) of the health centres had unsatisfactory symptomatic TB screening of OPD patients. This is higher than the proportion (10.9%) reported earlier by Heal TB among the Management Sciences for Health supported health centres in four zones.⁶ This difference could be attributed to the continuous clinical mentorship, regular programme monitoring and other capacity building activities provided by the partner. In our study, in addition to Heal TB, other partners, such as the International Training and Education Centre for Health (I-TECH) and the Ethiopia Network for HIV/AIDS Treatment, Care & Support (ENHAT-CS), were active in the study zones. Although partner support differs in scope and content, all were providing support for TB activities. Health centres supported by partners focusing on TB were 4.8 times more likely to have good screening practice.

Having a functioning MDT/IP team was significantly associated with good TB screening practice, as health centres with teams were eight times more likely to screen $\geq 80\%$ of OPD patients. In these TB programme-specific facility level meetings, health professionals discuss case-finding efforts, such as symptomatic TB screening, community suspect referrals, contact screening, intensified case finding activities and the quality of DOTS provided. Health care workers (HCWs) working at different

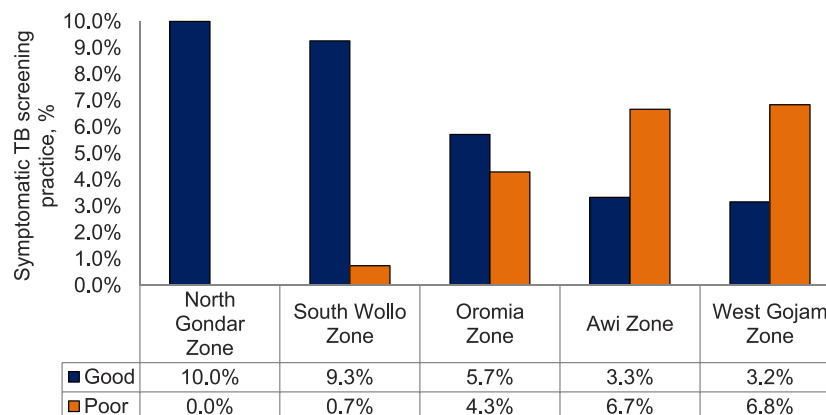


FIGURE Symptomatic TB screening practice at health centre out-patient departments by zone in the Amhara Region, Ethiopia, 2013. TB = tuberculosis.

TABLE 3 Bivariate and multivariate analysis of factors affecting screening practice, Amhara Region, Ethiopia, 2013

Variables	Screening practice		OR (95%CI)	aOR (95%CI)
	Good ($\geq 80\%$)	Poor ($< 80\%$)		
TB training				
Yes	36	15	0.83 (0.32–2.19)	0.49 (0.14–1.69)
No	26	9	1	1
Availability of ART service				
Yes	35	17	0.53 (0.19–1.47)	0.22 (0.06–0.85)*
No	27	7	1	1
Partner support for TB activities				
Yes	56	18	3.11 (0.89–10.86)	4.84 (1.05–22.4)*
No	6	6	1	1
Supervision by <i>woreda</i> health officers				
Yes	58	21	2.07 (0.43–10.04)	4.08 (0.69–24.12)
No	4	3	1	1
Functional MDT/IP team				
Yes	43	9	3.77 (1.41–10.12)*	8.29 (2.23–30.80)*
No	19	15	1	1
Patient overload				
Yes	10	3	0.74 (0.19–2.97)	0.53 (0.10–2.78)
No	52	21	1	1
Conduct review meeting				
Yes	52	22	0.47 (0.10–2.34)	0.18 (0.02–1.56)
No	10	2	1	1

*Statistically significant.

OR = odds ratio; CI = confidence interval; aOR = adjusted OR; TB = tuberculosis; ART = antiretroviral therapy; MDT = multidisciplinary team; IP = infection prevention; *woreda* = district.

entry points participate in these meetings.⁷ MDT/IP team meetings help HCWs to evaluate their performance every 2 weeks and identify local solutions to strengthen services.

In this study, screening practices were significantly poorer among health centres with ART services. This could be a result of a shift in focus among health care providers to screen patients for TB in the HIV clinic rather than in the OPD. As ART clinics were not included in this study, this assumption needs further investigation. However, if confirmed this would be disturbing, as screening would then only focus on people living with HIV (PLHIV) and not all health centre attendees. Although PLHIV are at higher risk of TB, only 40% of TB cases in the region were co-infected with HIV.³

Reported OPD patient load was not associated with screening practice in the current study. However, a study in South Africa showed that clinics with a high patient load were less likely to screen than clinics with fewer attendees.⁸ A study in Pakistan reported that both excessive workload and extremely low workload were associated with poor performance.⁹ In our study, recent TB training of HCWs was not associated with TB screening practice. The study from South Africa indicated that follow-up training of HCWs increased the effectiveness of integrated TB-HIV screening.⁸ This could be due to fact that some HCWs who attended training in our setting may not have been working in OPDs due to work rotation. HCWs with TB training should be assigned to TB clinics to strengthen anti-tuberculosis treatment.

The observed yield of presumptive TB at OPDs was 1.6%. This is lower than the World Health Organization estimate (5–10%) and reports from South India that 6.7% of out-patients in health centres were symptomatic for TB.^{10,11} The possible reasons for the lower yield include lower magnitude of TB symptoms, poor

screening quality and poor documentation. This should be investigated further.

Our study was limited by the small sample size, leading to wide CIs. Data were collected from existing records that may have been inaccurate. We were unable to link the health centre's OPD activity with TB-related laboratory activities, as both have different log books.

In conclusion, although the TB screening policy has been implemented widely in the Amhara Region, a quarter of the health centres still had poor symptomatic TB screening practices in the OPD services. To enhance TB detection, strengthening health centre TB meetings and expanding partner support for TB control are proposed. The negative association between the presence of ART services and OPD performance in TB screening needs to be further investigated.

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Contexte : En 2011, l'Éthiopie a introduit une stratégie de dépistage de la tuberculose (TB) basé sur les symptômes parmi les patients venant en consultation externe afin d'augmenter l'identification de patients suspects de TB.

Objectif : Évaluer la mise en œuvre et les facteurs affectant le dépistage symptomatique de la TB en consultation externe dans des centres de santé de la région d'Amhara, Éthiopie.

Schéma : Grâce à une étude transversale, 86 centres de santé publics, choisis au hasard et offrant des services DOTS, ont été inclus dans cette étude. Les données ont été recueillies grâce à une revue des registres et à des entretiens avec les personnes clé des services de consultations externes.

Résultats : Vingt-huit pour cent des centres de santé (24/86) avaient une pratique médiocre du dépistage symptomatique de la TB, définie comme un dépistage de <80% des consultants externes. Les facteurs

associés à un dépistage plus exhaustif comprenaient le fait d'avoir un centre de santé actif et bien fonctionnel, une équipe multidisciplinaire discutant des services liés à la TB (aOR 2,29, IC95% 2,23–30,80) et un soutien d'un partenaire pour les activités liées à la TB (aOR 4,84, IC95% 1,05–22,40) ; par contre, la disponibilité du traitement antirétroviral y était négativement associée. Dans tous les centres de santé combinés, 1,6% des consultants externes ont été identifiés comme suspects de TB.

Conclusion : Dans cette étude, un quart des centres de santé avait une pratique de dépistage de la TB médiocre dans ses services de consultation. Il est recommandé de renforcer les équipes multidisciplinaires et d'étendre le soutien par un partenaire afin d'améliorer la pratique du dépistage de la TB dans les services de consultation externe en Éthiopie.

Marco de referencia: En el 2011 se introdujo en Etiopía una estrategia de detección sistemática de la tuberculosis (TB) sintomática en los pacientes que acuden a los servicios ambulatorios, con el objeto de mejorar el reconocimiento de los casos con presunción clínica de TB.

Objetivo: Evaluar la aplicación de la estrategia de detección sistemática y los factores que influyen sobre sus resultados en los servicios ambulatorios de los establecimientos de salud en la región de Amhara en Etiopía.

Método: En un examen transversal se seleccionaron de manera aleatoria, con el fin de participar en el estudio, 86 centros de atención sanitaria que prestan servicios de DOTS. Los datos se obtuvieron a partir del examen de los registros clínicos y mediante entrevistas a los informantes clave en los servicios ambulatorios.

Resultados: Se observó que en 28% (24 de 86) de los centros sanitarios las prácticas de detección sistemática de la TB sintomática

eran deficientes, pues alcanzaban <80% de los pacientes ambulatorios. Los siguientes factores se asociaron con una tasa más alta de detección: un equipo multidisciplinario operativo que examine los servicios relacionados con la TB en el centro (ORa 2,29; IC95% 2,23–30,80) y el respaldo de los organismos asociados a las actividades relacionadas con la TB (ORa 4,84; IC95% 1,05–22,40); la oferta de tratamiento antirretrovírico ofreció una relación inversa con la detección de la TB. En general, se estableció el diagnóstico presuntivo de TB en 1,6% de los pacientes ambulatorios que acudieron a todos los centros.

Conclusión: En un cuarto de los establecimientos sanitarios examinados en el presente estudio las prácticas de detección sistemática de la TB en los servicios ambulatorios eran deficientes. Se recomienda fortalecer los equipos multidisciplinarios y ampliar el respaldo de los asociados con el propósito de mejorar la detección de la TB en Etiopía.