



Contents lists available at [SciVerse ScienceDirect](http://www.sciencedirect.com)

Transactions of the Royal Society of Tropical Medicine and Hygiene

journal homepage: <http://www.elsevier.com/locate/trstmh>



Short Communication

High initial default in patients with smear-positive pulmonary tuberculosis at a regional hospital in Accra, Ghana

F.K. Afutu^{a,*}, R. Zachariah^b, S.G. Hinderaker^c, H. Ntoah-Boadi^d, E. Apori Obeng^d,
F. Adae Bonsu^a, A.D. Harries^e

^a National Tuberculosis Programme, Disease Control Department, Ghana Health Services P.O. Box KB 493, Accra, Ghana

^b Medecins sans Frontieres, Medical Department (Operational Research Unit), Brussels Operational Center, Luxembourg

^c Centre for International Health, University of Bergen, Bergen, Norway

^d Ridge Regional Hospital, Ghana Health Service, Accra, Ghana

^e International Union Against Tuberculosis and Lung Diseases (The Union)

ARTICLE INFO

Article history:

Received 27 October 2011

Received in revised form 8 May 2012

Accepted 8 May 2012

Available online xxx

Keywords:

Ghana

TB

Initial defaulters

Laboratory register

Treatment register

ABSTRACT

Sputum smear-positive TB patients, diagnosed in the laboratory, who never start anti-TB treatment are classified as 'initial defaulters'. In Ridge Hospital, Accra, Ghana, there were 84 laboratory confirmed TB cases in 2009, of whom 32 (38%) were initial defaulters. Cure and default rates based on this cohort were 54% and 43% respectively, compared with rates of 87% and 8% when using the cohort based on 52 patients registered for treatment. This study highlights the problem of initial defaulters, and shows that programme performance may be poor when patients in laboratory registers are used as the cohort to evaluate treatment outcomes.

© 2012 Royal Society of Tropical Medicine and Hygiene. Published by Elsevier Ltd.
All rights reserved.

1. Introduction

Ghana is a country in West Africa with an estimated 24 million inhabitants (draft 2010 national population census report). The National Tuberculosis Programme (NTP) was established in 1994 and achieved countrywide directly observed therapy strategy (DOTS) coverage in 2005. In 2009, TB case notification was 63 per 100 000 population and the national HIV prevalence rate was 1.9%.¹

One of the key challenges facing the NTP is low TB case notification. The World Health Organization (WHO) estimates that Ghana detects 26% of all forms of TB and 36% of smear-positive TB cases.¹ There are several possible causes, one of which includes individuals being diagnosed with smear-positive pulmonary TB (PTB) in the laboratory

register but not being referred to or entered into the patient TB treatment register. Such individuals are referred to as 'initial defaulters'.² The extent of this problem in Ghana is not known. We therefore conducted a study to determine the proportion of sputum smear-positive PTB cases diagnosed in the laboratory but who never started anti-TB treatment (initial defaulters); the delay between TB diagnosis and treatment initiation in those starting treatment; and TB programme outcomes based on the laboratory register vs the patient TB treatment register.

2. Methods

The study was a review of routine programme data collected at Ridge Hospital, Accra, Ghana. Patients with cough ≥ 2 weeks submit sputum specimens to the laboratory for smear examination for acid-fast bacilli, and results are entered into the laboratory sputum register. Patients with

* Corresponding author. Tel.: +233 302 660 023; fax: +233 302 660 023.
E-mail address: kwami.afutu@ghsmai.org (F.K. Afutu).

smear-positive sputum are diagnosed as smear-positive PTB. They are referred to Ridge Hospital or one of the TB DOTS centers close to their residences, where information is entered into TB patient treatment registers and anti-TB treatment is commenced and monitored in accordance with WHO guidelines.³

All new sputum smear-positive individuals registered in the laboratory sputum register at Ridge Hospital in 2009 were included in the study. A line list was made of patients and cross-checked with names and laboratory numbers in patient treatment cards, referral registers and TB treatment registers at Ridge Hospital and DOTS centers between October 2010 and March 2011. Other collected variables included demography, TB diagnosis date, facility requesting sputum smear microscopy, patients' residential addresses, date of starting treatment and treatment outcomes. Data were collected, entered into an electronic data base and analyzed in SPSS (version 17.1, IBM corporation, Armonk, NY, USA). Using a non-parametric test (Fisher) we analysed the treatment outcomes among all the registered TB cases and compared them with all the cases detected in the laboratory. The level of significance was set at $p < 0.05$. The study received formal NTP approval, and ethics approval from the International Union Against Tuberculosis and Lung Disease Ethics Advisory Group, Paris, France. Exemption of ethics approval was given in Ghana as this was a register based and retrospective study with no identifiers.

3. Results

Of 849 TB suspects recorded in the laboratory sputum register, 84 (9.9%, 63 males) with a median age of 34 years were confirmed with smear-positive PTB. Of these, 32 (38%) could not be traced to any patient treatment register and were classified as initial defaulters. The remaining 52 patients initiated anti-TB treatment with a mean delay of 9 days (range 1–28). Differences in distance from the Ridge Hospital to patients' residences and treatment facilities were not statistically associated with initial default or treatment delays.

Treatment outcomes from the cohort of smear-positive patients based on the laboratory register and from the cohort of patients based on the TB treatment register are shown in Table 1. Cure rates were significantly lower and defaulter rates significantly higher when initial defaulters were included in the analysis.

Table 1

Treatment outcomes using laboratory registers of TB patients and TB treatment registers as the cohort of evaluation in Ridge Hospital, Accra, Ghana

Treatment outcomes	TB treatment register n = 52	Laboratory register n = 84	p value
Cured (%)	45 (87)	45 (54)	<0.001
Died (%)	3 (6)	3 (4)	0.8
Default (%)	4 (8)	36 ^a (43)	<0.001

^a Includes initial default.

4. Discussion

This study shows that in a routine programme setting in Ghana, four of ten infectious TB cases did not get registered for TB treatment, and programme reporting that excludes this group portrays an incorrect picture of programme performance. Treatment outcomes based on registrations in the laboratory register not surprisingly were inferior to those based on registrations in the patient treatment register. There was no statistical association between distance from the Ridge Hospital to the patients' residences and treatment facilities and initial default or treatment delays probably due to low numbers of cases.

The strengths of this study are that the data came from a programme setting, all facilities to which patients were referred were visited and records were rigorously verified. Limitations include the fact that initial defaulters were not actively traced, some individuals might have started treatment elsewhere and the initial defaulter rate might have been overestimated. This study was also conducted in an urban setting and may not reflect rural Ghana.

A number of studies in other African countries have reported on the problem of initial defaulters,^{2,4} and highlighted the programmatic and public health implications. A study from Cape Town, South Africa⁴ documented a 16–26% initial defaulter rate; a study conducted in Pakistan,⁵ reported a 13% rate. What can be done to improve the situation? First, the laboratory register should be completed with detailed addresses of all suspects including telephone numbers; and specific columns indicating the facilities requesting the sputum smear examination should be filled in correctly so that verification can be made on whether patients start anti-TB treatment. Second, TB treatment centers need to reconcile laboratory and treatment registers to identify and trace initial defaulters. Third, there is need for better education and communication to patients and health care workers on the importance of starting anti-TB treatment for all laboratory confirmed patients. Finally, quarterly reports should include results from laboratory sputum registers, including the number of initial defaulters.

In conclusion, in a regional hospital in Ghana there were important shortcomings in communication and feedback between TB diagnostic and treatment services leading to high rates of initial default. This influences programme performance and the situation needs to be rectified.

Authors' contributions: FKA conceived the study with the support of FAB and helped draft the manuscript. RZ, SGH and ADH mentored the study and helped design the study protocol, assisted data analysis and supported manuscript writing. EAO approved the study site and supported data collection and dissemination of study findings in his facility. HNB collected the study data. ADH also critically revised the manuscript for intellectual content. All authors read and approved the final manuscript. FKA is guarantor of the paper.

Acknowledgements: This research was supported through an operational research course, which was jointly developed and run by the Centre for Operational Research,

International Union Against Tuberculosis and Lung Disease, France, and the Operational Research Unit, Medecins sans Frontieres, Brussels Operational Centre, Luxembourg. We also acknowledge the support of the Central TB Unit staff, namely Mrs. Faustina Agbenaza and Ms Mabel Tetteh, for helping in data entry and audit respectively. We gratefully acknowledge Dr Nii Nortey Hanson Nortey for recommending the operational research course and Dr. Rhehab Chimzizi for his mentorship.

Funding: The National TB Control Programme, Accra, Ghana funded the data collection for the study and agreed to submit the manuscript for publication.

Competing interests: None declared.

Ethical approval: Was not required in Ghana as the study involved analysis of routinely collected programme data which was stripped of patient identifiers. The study

received ethics approval from the Ethics Advisory Group of the International Union Against TB and Lung Disease, Paris, France.

References

1. WHO. Global tuberculosis control: epidemiology, strategy, financing. Geneva: World Health Organization; 2009. WHO/HTM/TB/2009.411.
2. Harries AD, Rusen ID, Chiang C-Y, Hinderaker SG, Enarson DA. Registering initial defaulters and reporting on their treatment outcomes. *Int J Tuberc Lung Dis* 2009;**13**:801–3.
3. WHO. Treatment of tuberculosis. Guidelines for national programmes. 4th ed. WHO/HTM/TB/2009.420 Geneva: World Health Organization, 2009.
4. Botha E, Den Boon S, Verver S, et al. Initial default from tuberculosis treatment: how often does it happen and what are the reasons? *Int J Tuberc Lung Dis* 2008;**12**:820–3.
5. Khan Mishal S, Khan Shoaib, Godfrey-Faussett P. Quantify default during diagnosis in TB suspects and in smear-positive cases; to investigate sex differences in default during diagnosis in all of Pakistan. *Trop Med Int Health* 2009;**14**:1437–41.