

# Declining uptake of HIV testing among tuberculosis patients in Enugu state of Nigeria: The need for a reappraisal of strategy

CC Dim

Departments of Physiology/Obstetrics and Gynaecology, Erasmus Mundus Scholar of International Health, University of Nigeria, Enugu Campus, Nigeria

## Abstract

**Background:** The prevalence of HIV in Enugu State is the highest in Southeastern Nigeria. Since HIV is associated with TB, it is important to assess the performance of the Enugu State TB program as regards HIV screening of TB cases. This study assesses the proportions of TB cases that are screened for HIV as well as the prevalence of HIV among individuals with TB at the Enugu State TB program of Nigeria.

**Materials and Methods:** The study was a retrospective review of data from the Enugu State TB program, Nigeria, from 2008 to 2009. Analysis was both descriptive and inferential at 95% confidence levels.

**Results:** A total of 3,286 TB cases were registered within the 2-year period. Out of these, 1,867 (56.8%) were new sputum smear positive (ss+). In all, 67.9% and 78.9% of all-TB cases were screened for HIV in 2009 and 2008 respectively [OR=0.57 (0.48–0.67)]. Also, 83.0% and 87.9% of new ss+ cases were screened for HIV in 2009 and 2008 respectively [OR=0.68 (0.52–0.88)]. The mean HIV prevalence for all TB cases was 34.5%.

**Conclusion:** The performance of the State's TB program with respect to HIV screening of TB patients reduced significantly in 2009 when compared to 2008. Improved program monitoring and the opt-out approach of the provider initiated HIV testing and counseling are recommended.

**Key words:** Enugu, HIV, Nigeria, opt-out option, provider-initiated HIV screening and testing, tuberculosis

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## Introduction

Tuberculosis (TB) is an infectious disease caused by members of the *Mycobacterium tuberculosis complex*.<sup>[1,2]</sup> About a third of the world's population is estimated to be infected with the disease causing organisms, while the lifetime risk of developing the disease is 5–10%.<sup>[3]</sup> In Nigeria, the majority of TB infections are caused by *M. tuberculosis* followed by *M. africanum*, and *M. bovis*;<sup>[4]</sup> and most importantly, the burden of the disease is the highest in Africa.<sup>[5,6]</sup> Furthermore, the global effort at controlling the disease through the Stop TB initiative has been seriously challenged by the human immunodeficiency

virus (HIV) pandemic in developing countries. This is because, TB is associated with HIV infection; HIV-positive individuals are about 20 to 37 times more likely to develop TB when compared to HIV-negative individuals.<sup>[6]</sup> Likewise, a TB patient who is coinfecting with HIV (TB/HIV) is more likely to die, and when sputum positive (ss+), is more likely to transmit the infection. In view of the above public health issues and the fact that the protocol for TB/HIV treatment varies from that of a TB case without HIV,<sup>[7,8]</sup> it becomes very important to screen TB patients for HIV.

### Address for correspondence:

Dr. Cyril C Dim,  
Departments of Obstetrics and Gynaecology, Faculty of Medical Sciences, College of Medicine, University of Nigeria, Enugu Campus (UNEC), P.M.B. 01129, Enugu - 400 001, Nigeria.  
E-mail: dyme72@yahoo.com

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Nigeria ranks top in Africa with respect to the burden of both TB and HIV infections. In 2007, the estimated proportion of TB cases that were coinfecting with HIV was 27%.<sup>[6]</sup> On the other hand, Enugu State of Nigeria has the highest HIV prevalence in the southeastern geopolitical zone of the country.<sup>[9]</sup> It is therefore likely that the TB/HIV prevalence in the State is equally high which calls for a special effort at screening for HIV among individuals with TB and vice versa. It has been observed that all cases of TB were not screened for HIV at the TB treatment sites in the State, unlike in the adult HIV treatment sites where TB screening is part of the routine investigations carried out after diagnosis of HIV. It became important to assess the performance of the State's TB program as regards HIV screening of reported TB cases.

The study was designed to determine the proportions of cohorts of TB cases that were screened for HIV at the Enugu State TB program, Nigeria, and the prevalence of HIV among individuals diagnosed with TB in the program. It is hoped that the study findings would assist both the National and Enugu State TB programs in their efforts at rendering quality services to TB patients.

## Materials and Methods

The study was a retrospective review of unpublished secondary data of all patients registered under the TB control program of the Ministry of health, Enugu State, Nigeria covering the 2-year period from 2008 to 2009. It was carried out over a 3-month period of March to May 2010. The data source was the annual registration (cohorts) of TB from all the Directly Observed Therapy Short course (DOTS) centers in the State – for the purpose of this study, a cohort means a group of TB patient diagnosed and registered for a specified 1-year period.<sup>[10]</sup> Variables of interest were patients' disease category, age, sex, HIV screening status, and results. There were no data on TB/HIV for the period prior to 2008.

The Enugu State TB control program utilizes the serial rapid antibody testing which involves the use of two sequential HIV antibody tests. The second test is offered to a client only when the first test is positive.

Data analysis was done with Microsoft Excel software while data presentations were basically descriptive using tables and chart. However, Epi Info software version 3.5.1 was used where applicable for inferential statistics at 95% confidence level, and results were expressed using odd ratios (OR) and *P* values. A *P* value <0.05 was considered statistically significant.

The TB control activities in Nigeria are coordinated by the *National Tuberculosis and Leprosy Control Programme* (NTBLCP)

The detailed structure of the National Tuberculosis Control Programme and the current definitions for categories of registered sputum smear positive TB patients in Nigeria have been described in related publications.<sup>[11,12]</sup>

Enugu State is one of the five states in the southeastern zone of the country. It has an approximate land mass of 8,727.1 km<sup>2</sup>. The State capital is Enugu which is about 5 hours drive from Abuja, the capital of Nigeria. The most recent census figure for the State was 3,257,298 million.<sup>[13]</sup> and the estimated population growth rate is 2.28%.<sup>[14]</sup> About 95% of the State's population are ethnic Igbos and most of the existing 17 LGAs are rural with majority of the working population being farmers and petty traders.<sup>[14]</sup> The health care services in the State are delivered by both private and government (public) health facilities. The latter includes the primary health care (PHC) facilities which are the operational sites of the DOTS. The State has DOTS services in all the 17 LGAs of the state with a total of 95 functional DOTS and 30 microscopy centers.<sup>[11]</sup>

## Results

For the 2-year period under review, a total of 3,286 all-TB cases were registered in Enugu State of Nigeria which included 1,602 cases in 2008 and 1,684 cases in 2009. Out of these, 2,797 (85.1%) patients were new cases of pulmonary tuberculosis which included 1,867 (56.8%) new ss+ cases and 930 (28.3%) new sputum smear negative (ss-) cases. There were 286 (8.7%) extrapulmonary cases while the remaining 6.2% of all cases were made up of relapse, failure, return after default, and others. Nine hundred and sixty five (60.2%) new ss+ cases were registered in the year 2008 which consisted of 532 (55.1%) and 433 (44.9) females. For year 2009, a total of 902 (53.6%) new ss+ cases were registered – 478 (53.0%) males and 424 (47.0%) females. For both cohorts of new ss+ cases, the 25- to –34-year age group had the highest burden of TB (18.2%) while the 0- to 14-year age group had the least number of cases (1.8%). In general, the proportion of new ss+ male cases (54.1%) registered within the study period was higher than that of females (45.9%).

One thousand one hundred and forty four (67.9%) of all-TB cases were screened for HIV in the year 2009, while 1,264 (78.9%) were screened in 2008. The observed decrease in screening rate was statistically significant [*P*<0.001, OR=0.57 (95% CI: 0.48, 0.67)]. Likewise, the 749 (83.0%) of new ss+ TB cases screened for HIV in the year 2009, was significantly lower than the 848 (87.9%) screened in 2008 [*P*<0.003, OR=0.68 (95% CI: 0.52, 0.88)] [Table 1 and Figure 1].

Out of all TB cases tested for HIV each year, 411 (32.5%) and 414 (36.2%) cases were HIV positive in 2008 and 2009

respectively. The observed difference was not statistically significant [ $P < 0.059$ , OR = 1.18 (95% CI: 0.99, 1.40)]. Similar prevalence figures were also observed for new ss+ cases [Table 2 and Figure 1]. In all, the mean prevalence of HIV for all TB cases over the 2-year period was 34.4%, while that of the new ss+ PTB was 30.7%. Also, the prevalence of HIV among all TB cases and new ss+ PTB cases were higher in 2009 when compared to their corresponding values in 2008. Details of the prevalence of HIV infection among TB cohorts in Enugu State are shown in Table 2.

### Discussion

In this study, the male gender and the 25- to 34-year age group bore the greatest burden of TB, which is consistent with the current epidemiology of the disease.<sup>[6]</sup> Considering the Nigerian national TB case detection rate of about 30%,<sup>[11]</sup> it is most probable that the total number of TB cases registered in the Enugu State TB program during

the study period was just a tip of the ice berg, which calls for a more active case detection strategy. The mean TB/HIV prevalence of over 30% identified in this study was higher than the Nigerian national estimate of 27%.<sup>[6]</sup> This observation may not be surprising because of the fact that Enugu State has the highest HIV prevalence in the southeastern zone of Nigeria.<sup>[9]</sup> This equally underscores the special need to ensure that all TB cases are tested for HIV so as to optimize their care. Furthermore, for those TB cases that were not tested for HIV, the likely scenario was that the prevalence of TB/HIV among them might be similar to the observed figures with its attendant implications on public health and patient management. For instance, it has been established that an active TB case that tested positive to HIV should commence anti-TB, after which an appropriate antiretroviral regime is commenced as soon as possible within 8 weeks.<sup>[8]</sup> In view of the above scenario, it becomes more worrisome that the proportion of both all TB and new ss+ cases tested HIV in 2009, in the Enugu State TB program of Nigeria, was significantly lower than the preceding 2008 [Table 1]. This declining uptake may suggest program failure in that regard which should demand an urgent reevaluation of the program strategy and monitoring.

Screening for HIV could be client initiated – voluntary counseling and testing (VCT) or provider initiated – provider initiated HIV counseling and testing (PIHTC).<sup>[15]</sup> Thus, the latter has three approaches – mandatory, opt-in, and opt-out. The mandatory approach makes HIV testing compulsory for all patients thus raising human right issues; it is therefore not encouraged. On the other hand, both opt-in and opt-out approaches involve pretest information which should include the patient’s information on his/her right to decline the test. However, in the opt-in approach, the patient should explicitly consent to HIV testing before it could be carried out, while in the opt-out approach, the patient “must specifically decline the HIV testing if s/he does not want it performed.”<sup>[15]</sup> The National TB program of Nigeria recommends PIHTC but was not

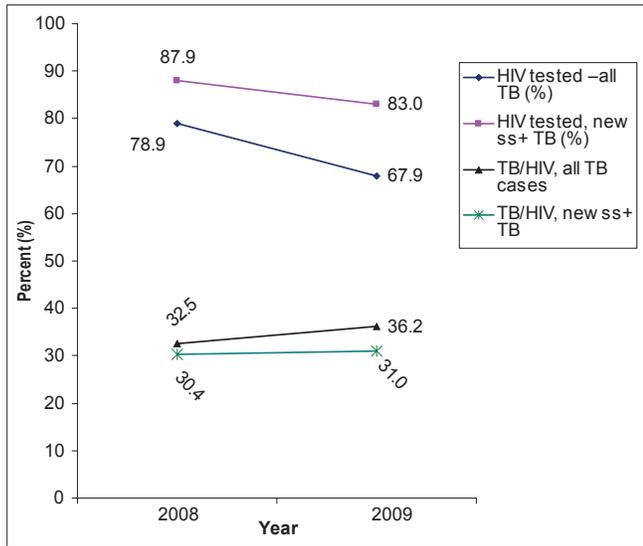


Figure 1: Graphical representation of HIV screening, in TB program of Enugu State, Nigeria

TB category	TB cohort (year)	No of cases	HIV tested (%)		P value	OR (95% CI)
			Yes	No		
All TB	2009	1,684	1,144 (67.9)	540 (32.1)	<0.001	0.57 (0.48 - 0.67)
	2008	1,602	1,264 (78.9)	338 (21.1)	-	-
	Total	3,286	2,408 (73.3)	878 (26.7)		
New ss+ TB	2009	902	749 (83.0)	153 (17.0)	0.003	0.68 (0.52 - 0.88)
	2008	965	848 (87.9)	117 (12.1)	-	-
	Total	1,867	1,597 (85.5)	270 (14.5)		

	Year 2008	Year 2009	Mean TB/HIV (%)	P-value	OR (95% CI)
HIV+ve (all TB)	411 (32.5) <sup>a</sup>	414 (36.2) <sup>a</sup>	34.5	0.059	1.18 (0.99--1.40)
HIV+ve (new ss+)	258 (30.4) <sup>b</sup>	232 (31.0) <sup>b</sup>	30.7	0.812	1.03 (0.82--1.28)

<sup>a</sup>Denominator = all TB cases tested for HIV; <sup>b</sup>Denominator = new ss+ cases tested for HIV.

explicit on the approach.<sup>[7]</sup> However, a critical look at the steps outlined in the program's manual especially the "confirmation of willingness of patient to proceed with test and seek informed consent"<sup>[7]</sup> suggests that the National program recommends the opt-in approach. Unfortunately, suboptimal yield of similar protocols have been reported from other developing countries.<sup>[16,17]</sup> Therefore, the use of the opt-in approach of PIHTC in the Enugu State TB program may be contributing to the increasing unmet HIV testing need within the program. This assumption may also hold for the national TB program where only 62.2% of TB patients were tested for HIV in 2008.<sup>[11]</sup> The experience from cervical cancer screening in Nigeria suggests that the awareness of a preventable disease may not translate to its improved screening.<sup>[18]</sup> Therefore, some form of "prompting" has been recommended to overcome the inertia and fear that might delay or prevent the screening of at-risk individuals; the "opt-out" approach is believed to provide this "prompting."<sup>[19]</sup>

It is therefore recommended that the Enugu State TB program should scale up its HIV screening by adopting the opt-out approach of PIHTC and improve its program monitoring in the area of HIV screening. This suggestion if adopted should go with staff retraining so as to ensure effective implementation. Because the NTBLCP workers' manual is used by all State TB programs in Nigeria, the above recommendation may apply to the national TB control program.

This study was limited by its reliance on "cleaned" data from the Enugu State TB program. Nevertheless, the validity of the data is not in doubt and the study's results were unlikely to have been affected. It was also not possible to study the effect of patients' demographic and other variables such as educational status on HIV screening status and results. Furthermore, the study recognizes other possible impediments to HIV screening in our environment including funding and availability of test kits, which might have contributed to the declining uptake of HIV screening in the program.

It is concluded that TB/HIV prevalence in Enugu State of Nigeria is very high. The performance of the State's TB program with respect to HIV testing of TB patients was not only suboptimal but it also declined significantly in 2009 when compared to 2008. The adoption of the "opt-out" approach of PIHTC as well as improved program monitoring, by the State's TB program, may help to scale up the HIV testing among TB patients.

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