

## **Implementation of the Revised Guideline on TB/HIV Collaborative Activities in Lagos, Nigeria**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author OJD conceived the study, was involved in data collection and wrote part of the manuscript. Author OAA was involved in writing the manuscript, did the statistical analyses and literature searches while Author HAA was involved in data collection and proof reading of the manuscript. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Background:** The National Tuberculosis and Leprosy control programme commenced the implementation of the revised national tuberculosis/human immunodeficiency virus (TB/HIV) guideline in line with the recommendations from the World Health Organization in January 2013. This study evaluated the effect of the revised guideline on the implementation of TB/HIV collaborative activities geared towards reducing the burden of HIV in TB patients in Lagos, Nigeria.

**Methods:** Retrospective review of presumptive and TB cases managed in TB treatment centers of

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the Lagos State TB and Leprosy control programme between January 1<sup>st</sup> to December 31<sup>st</sup> 2012 (pre implementation period) and January 1<sup>st</sup> to December 31<sup>st</sup> 2013 (post implementation period). Analysis was done using Statistical Package for Social Sciences (SPSS) version 19.

**Results:** Of the 19,533 presumptive TB cases registered during the pre implementation period 17,530 (89.7%) were offered HIV counseling and testing (HCT) out of which 15,247 (87%) accepted to be tested and 20.9% of those tested for HIV were positive. However in the post implementation period, of the 22,721 presumptive TB registered cases, 20397 (89.8%) were offered HCT and 19,264 (94.4%) accepted to be tested. Of those that were tested, 4430 (23%) were HIV positive. The proportion of TB/HIV co-infected patients enrolled on co-trimoxazole preventive therapy (CPT) and antiretroviral therapy (ART) during the pre and post implementation period were 76.6% vs 88.2% and 39.1% vs 49.8% respectively at  $p < .05$ .

**Conclusion:** There was increase in the uptake of HIV testing, ART and CPT post implementation of the guideline. Sustaining the gains of policy implementation is of utmost importance.

*Keywords: TB/HIV guideline; uptake; ART; CPT; HCT; Nigeria.*

## 1. INTRODUCTION

Human Immunodeficiency Virus (HIV) infection is the leading risk factor for the development of tuberculosis (TB) while active TB infection is the leading cause of death in persons living with HIV (PLHIV) [1]. In 2004, the World Health Organization (WHO) developed an interim policy on the implementation of joint TB/HIV collaborative activities to assist countries to mitigate the effect of the dual infection and reduce the burden of HIV in TB patients [2]. The policy focused on promoting HIV counseling and testing (HCT) and HIV prevention methods for all TB patients, co-trimoxazole preventive therapy (CPT) and HIV/AIDS care and support including antiretroviral therapy (ART) for those with TB/HIV co-infection [2]. A revised guideline for the implementation of TB/HIV collaborative activities for national programmes and other stakeholders was published in 2012 by WHO [3]. It emphasized routine HIV testing and counseling for all presumptive and diagnosed TB patients, routine administration of co-trimoxazole preventive therapy to HIV infected patients with active tuberculosis irrespective of CD4 count and the commencement of antiretroviral treatment in TB patients living with HIV irrespective of their CD4 counts. It also recommended the commencement of ART within the first 8 weeks of TB treatment. However TB/HIV co-infected patients with CD4 count less than 50 should receive ART within the first two weeks of initiating TB treatment. It has been shown that early treatment of TB/HIV co-infected patients with ART enhances their survival and improves their chances of having treatment success with TB treatment [4].

The Nigerian National TB and Leprosy Control Programme (NTBLCP) also revised the National

TB/HIV guideline in line with the recommendations of WHO [5]. The full implementation of the revised guideline commenced in January 2013. This study therefore evaluate the effect of the implementation of the revised guideline on the TB/HIV collaborative activities on the burden of HIV in TB patients in Lagos, Nigeria.

## 2. METHODOLOGY

Lagos state is located in the south west geopolitical zone of Nigeria with an estimated population of 9.3 million according to the 2006 national population census. The state is divided into 20 Local Government Areas (LGAs). The Lagos State TBL control programme (LSTBLCP) commenced in 2003 with the collaboration between the Lagos State Government, International Union against TB and Lung Diseases (IUATLD), World Health Organization (WHO), Canadian International Development Agency (CIDA) and the United States Agency for International Development (USAID). There are 218 TB treatment centers and 54 TB microscopy centers scattered all over the state. Each of the TB clinics is managed by a trained general health care worker usually a community health officer or community health extension worker at the local government level and a nursing officer at the secondary or tertiary level.

A presumptive TB patient is defined according to the national guideline as one having ongoing cough for two weeks or more, while a diagnosed TB patient is one who has at least 2 sputum smear examined positive for AFB (positive), or a person whose sputum smear is negative (based on other ancillary investigations) but was confirmed by a medical officer as having clinical tuberculosis (Sputum negative pulmonary TB) or

patients with signs and symptoms suggestive of TB outside the lung (Extra pulmonary TB) [5]. Two sputum samples are usually collected from TB suspects in the clinic and transported to the laboratory by the TB and Leprosy Supervisor (TBLS). The TBLS also retrieves the sputum result of the patient from the laboratory which is used to decide the treatment modalities. Each diagnosed patient was registered and commenced on the 6 months regimen treatment. This consists of a fixed dose drug combination of rifampicin, isoniazid, ethambutol and pyrazinamide in the intensive phase lasting two months and ethambutol and isoniazid for 4 months continuation phase, also as fixed dose combination.

The criteria for the evaluation includes: HIV test offered to all presumptive TB clients. Each presumptive TB patient was offered HIV testing by the general health care worker at the TB clinic. This involves pre-information on HIV and confirmation of their willingness to have the HIV test done before conducting the test. The HIV rapid test kit used in accordance with the national HCT policy was Determine (determine HIV-1/2 Alere Determine™, Japan 2012) and Uni-Gold™ (Trinity Biotech PLC, Wicklow, Ireland 2013) in parallel algorithm. A concordance result was regarded as positive. In cases of discordant result, STAT-PAK® was used as the tie breaker. Patients who were TB/HIV co-infected should be offered CPT along with their anti-TB medications. TB/HIV co-infected patients should be referred to the ART clinic where they should be offered ART within 8 weeks of commencement of their anti-TB medications.

Data was collected from presumptive TB register and the central TB treatment register submitted to the LSTBLCP between January 1, 2012 to December 31, 2013. The study period is divided into: pre implementation period (January 1 2012 to December 2012) and post implementation period (January 1 2013 to December 31 2013). All TB patient registered during the study period were included in the study.

## 2.1 Data Analysis

Percentages of numerical and categorical variables were determined; chi square was used to determine the difference between categorical variables. Confidence interval was set at 95% for all statistical tests. P value less than .05 was considered statistically significant. Microsoft excel was used to draw chart.

## 2.2 Ethical Issues

Data for this study were retrieved from secondary data routinely collected by the Lagos State TB control programme and as such no ethical clearance was obtained.

## 3. RESULTS

### 3.1 Presumptive TB Cases

A total of 19,533 presumptive TB cases were registered during the pre implementation period compared to 22,721 registered during the post implementation period. Of the 19,533 presumptive TB cases reported during the pre implementation period, 17,530 (89.7%) were offered HCT and 15,247 (87%) accepted to be tested out of which 20.9% were HIV positive. Out of the 22,721 presumptive TB cases seen during the post implementation period, 20397 (90%) were offered HCT while 19,264 (94.4%) accepted to be tested. Of those that were tested, 4430 (23%) were HIV positive as shown in Table 1.

### 3.2 Diagnosed TB Cases

A total of 8455 (43.3%) out of the 19,533 presumptive TB cases were registered for TB treatment during the pre implementation period while 9444 (41.6%) were registered out of the 22,721 presumptive TB cases during the post implementation period. Of the 8455 registered TB patients during the pre implementation period, 7787 (92.1%) were offered HCT, out of which 7482 (96.1%) accepted to be tested for HIV and 1666 (22.3%) were HIV positive. Similarly during the post implementation period 8726 (92.4%) were offered HCT, out of which 8260 (94.7%) accepted to be tested for HIV and 1835 (22.2%) were HIV positive. as shown in Table 2. TB patients who were tested for HIV were significantly more in the pre implementation phase compared with the post implementation phase ( $\chi^2 = 18.74$ ,  $df = 1$ ,  $P < .001$ ).

Of the total TB cases notified, the proportion of those less than 15 years (childhood TB) was significantly higher (7.3%) during the post implementation period compared with the pre implementation period (6.4%) ( $\chi^2 = 5.40$ ,  $df = 1$ ,  $P = .02$ ). In total 15.5% (746/4800) males compared to 25.2% (920/3655) of females were TB/HIV co-infected in the pre implementation period while 15.2% (814/5352) males compared

to 44.8% (1021/4092) females were TB/HIV co-infected in the post implementation period ( $\chi^2 = 0.02$ ,  $df = 1$ ,  $P = .893$ ) as shown in Table 3.

The TB/HIV co-infected patients were registered for TB treatment. The proportion of TB/HIV co-infected patients enrolled on CPT and ART were 76.6% and 39.1% respectively during the pre implementation period while in the post

implementation period the proportion TB/HIV co-infected patients enrolled on CPT and ART were 88.2% and 49.8% respectively. Females had a higher uptake of CPT in both the pre- (77.8% vs 74%) and post implementation period (89% vs 86%). Similarly females had higher uptake of ART during the pre (39.6% v 38.1%) and post implementation period (51.3% vs 47.7%) as shown in Fig. 1.

**Table 1. Presumptive patients who were offered and tested for HIV during the pre and post implementation phase in Lagos**

Variable	Pre implementation period	Post implementation period	$\chi^2$	P value
Total presumptive TB cases	19533	22721		
Proportion offered HIV testing	17530/19533(89.7%)	20397/22721(89.8%)	0.01	0.9299
Proportion tested for HIV	15247/17530(87.0%)	19264/20397(94.4)	641.66	<0.001
Proportion positive for HIV	3188/15247(20.9%)	4430/19264(23%)	21.56	<0.001

NB: HIV = Human Immune deficiency Virus; TB = Tuberculosis

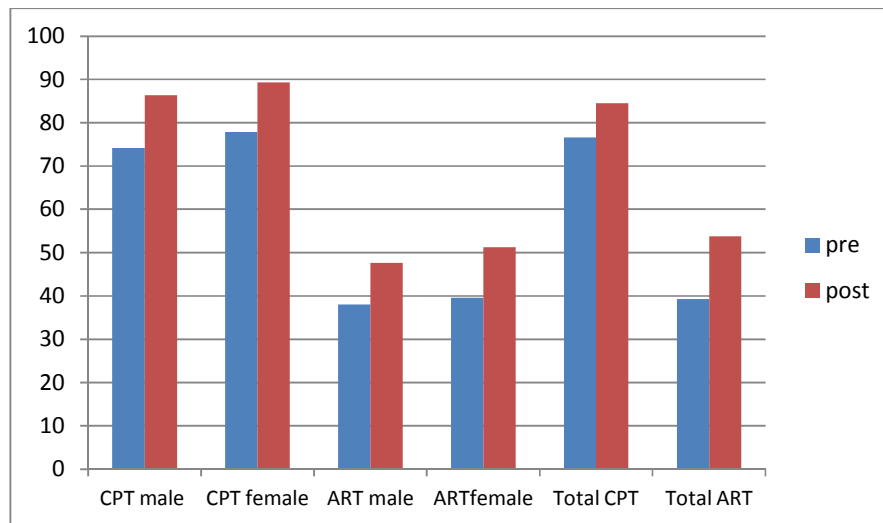
**Table 2. Diagnosed TB patients who were offered and tested for HIV during the pre and post implementation phase in Lagos**

Variable	Pre implementation	Post implementation	$\chi^2$	P value
Total registered	8455	9444	NA	
Male: Female ratio	1: 0.76	1:0.76	NA	
Proportion offered HIV test	7787/8455(92.1%)	8726/9444(92.4%)	0.55	0.457
Proportion tested for HIV	7482/7787 (96.1%)	8260/8726 (94.7%)	18.74	< 0.001
Proportion HIV positive	1666/7482 (21.4%)	1835/8260 (22.2%)	0.01	0.938
Proportion on CPT	1276/1666 (76.6%)	1618/1835 (88.2%)	81.76	< 0.001
Proportion on ART	652/1666 (39.1%)	913/1835 (49.8%)	39.83	< 0.001
% yield of HIV+ who did not have active TB	3188-1666/3188 (47.7%)	4130-1835/4130 (55.6%)	44.18	< 0.001

Note: NA = Not applicable; HIV = Human Immune deficiency Virus; CPT = Co-trimoxazole preventive therapy; ART = Anti retroviral therapy; TB = Tuberculosis

**Table 3. Age, gender and HIV status of TB cases notified during the pre and post implementation period in Lagos**

Variable	Pre implementation period freq (%)	Post implementation period freq (%)	$\chi^2$	P value
<b>Age group</b>				
0- 14	539 (6.4)	685 (7.3)	5.40	0.020
≥ 15	7916 (93.6)	8759 (92.7)		
Total	8455 (100.0)	9444 (100.0)		
<b>Gender</b>			0.02	0.893
Male	4800 (56.8)	5352 (56.7)		
Female	3655 (43.2)	4092 (43.3)		
Total	8455 (100.0)	9444 (100.0)		
<b>HIV positive cases by gender</b>			0.06	0.804
Male	746 (44.8)	814 (44.4)		
Female	920 (55.2)	1021(55.6)		
Total	1666 (100.0)	1835 (100.0)		



**Fig. 1. Percentage of TB/HIV co-infected patients on CPT and ART by sex during the pre and post implementation period**

NB: HIV = Human Immune deficiency Virus; CPT = Co-trimoxazole preventive therapy; ART = Anti retroviral therapy; TB = Tuberculosis

#### 4. DISCUSSION

This study showed that a high proportion of presumptive TB cases were offered HIV testing and counseling during the pre and post implementation period. This may be due to the improved skill to offer provider initiated HIV testing and counseling (PITC) as a result of ongoing efforts at training all health care workers on PITC of all presumptive and diagnosed TB patients in accordance with the national guideline. The PITC strategy differs from the traditional voluntary counseling and testing in that HIV testing is offered by the provider to the patient as part of routine care. Patients were given the opportunity to decline and usually emphasis is placed on post-test counseling rather than pre-test counseling which is the practice during voluntary counseling and testing [3]. The experience of PITC in some African countries shows high rate of uptake of HIV testing similar to what was observed in this study [6-8].

The HIV prevalence among TB patients in this study ranged from 21.4% - 22.2%. This is lower than HIV prevalence of 27.2% - 61% [9-13] reported among TB patients in eastern and southern African countries. This may be as a result of the higher HIV prevalence in the general population of these countries compared with 3.4% HIV prevalence rate in the general population in Nigeria [13].

The implementation of PITC among presumptive TB patients presents an opportunity for early diagnosis of HIV and referral for HIV services especially in patients with presumptive TB without active TB disease. In our study, 55.6% of presumptive TB patients co-infected with HIV in the post implementation phase compared with 47.7% in the pre implementation phase were not diagnosed with active TB. The HIV screening provided an opportunity for such clients to know their HIV status, receive accurate information and be referred for HIV care and support. It also affords presumptive TB patients who were HIV negative and without active TB, to know their HIV status, assess their risk for HIV and make informed decisions to stay negative.

Our study observed that there was a significant increase in the proportion of TB/HIV co-infected commenced on CPT between the pre and post implementation period from 76.6% to 88.2%. This was higher than 45.9% - 70% reported in similar studies [14-17]. The WHO recommended the routine use of CPT as a proven strategy to reduced morbidity and mortality among co-infected patients. One of the reasons for increase in CPT uptake during the post implementation period may be that health care workers now understand the importance of CPT in improving the survival of co-infected patients. Also the availability of co-trimoxazole made possible by the National TB and Leprosy Control programme and the implementing partners supporting

HIV/AIDS services in the state have greatly contributed to this success.

The study also showed a significant increase (39.1% to 49.8%) between the pre- and post-implementation period among TB/HIV co-infected patients who commenced ART within 8 weeks of starting anti-TB medications ( $P<.001$ ). ART uptake among TB patients was higher compared with 13% - 41.4% reported in studies from other African countries [18-20]. Despite the recent recommendations, there are still some hesitations among HIV care providers to implement this new strategy. Many HIV care providers prefer the use of stringent eligibility criteria for the commencement of ART thereby denying some co-infected patient from early commencement of ART. In addition some practitioners were of the opinion that immune reconstitution syndrome is commoner among TB/HIV co-infected patients commenced on TB and HIV medications simultaneously. In such situation, clinicians managing HIV patients prefer TB/HIV co-infected patients to complete their anti-TB medications before commencement of ART. Others have attributed the low ART uptake among co-infected patients to poor record keeping at the facility [21]. There is therefore the need to strengthen the monitoring and evaluation systems at the facilities. Studies have shown that the early commencement of ART in TB/HIV co-infected patients reduces the morbidity and mortality in co-infected patients [3,18]. The ongoing engagement of HIV care providers in the country on the early commencement of ART is necessary to improve survivability of co-infected patients.

## 5. CONCLUSION

Uptake of CPT and ART was significantly higher during the post implementation of the new revised TB/HIV guideline. Sustaining the gains of policy implementation is of utmost importance.

## CONSENT

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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