

TUBERCULOSIS CASE MANAGEMENT AND TREATMENT OUTCOME: ASSESSMENT OF THE EFFECTIVENESS OF PUBLIC – PRIVATE MIX OF TUBERCULOSIS PROGRAMME IN KADUNA STATE, NIGERIA

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Abstract

Background: In an effort to increase tuberculosis (TB) case detection, the Kaduna State TB program in Nigeria started Public-Private Mix (PPM DOTS) in 2002. This study assessed and compared the TB case management practices and treatment outcomes of the public and private health facilities involved in the TB program.

Methods: A comparative cross-sectional descriptive study was carried out in 5 private and 10 public health facilities providing TB services for at least two years in the four Local Governments Areas in Kaduna State where both public and private health facilities are involved in the TB program. The heads of the health facilities were interviewed and case notes of all the 492 TB patients registered in these facilities between January 2003 and December 2004 reviewed.

Results: Except for the lower use of sputum microscopy for diagnosis, adherence to national TB treatment guidelines was high in both private and public health facilities. The private health facilities significantly saw more TB patients, an average of 51 patients per health facility compared to 23 patients in the public health facilities. There was better completion of records in the public health facilities while patient contact screening was very low in both public and private health facilities, 13.1% and 12.2% respectively. The treatment success rate was higher among patients managed in the private health facilities (83.7%) compared to 78.6% in the public health facilities.

Conclusion: Private health facilities adhere to national guidelines had higher TB patient case load and better treatment outcome than public health facilities in Kaduna State. PPM-DOTS should be scaled-up and consolidated.

Key Words: Tuberculosis, public-private mix, DOTS, treatment, outcome

Résumé

Fond: Dans un effort d'augmenter la détection de cas de la tuberculose (TB), le programme de l'état TB de Kaduna au Nigéria a commencé le mélange Public-Privé (POINTS de page par minute) en 2002. Cette étude évalué et comparé les procédures de gestion de cas de TB et les résultats de traitement du public et des équipements privés de santé impliqués dans le programme de TB.

Méthodes: A l'étude descriptive en coupe comparative a été effectuée dans 5 équipements de santé privée et 10 publique fournissant des services de TB pendant au moins deux années dans les quatre régions de gouvernements locaux dans l'état de Kaduna où des équipements publics et privés de santé sont impliqués dans le programme de TB. Les têtes des équipements de santé ont été interviewées et

des notes de cas de tous 492 patients de TB enregistrés dans ces équipements entre les janvier 2003 et décembre 2004 passés en revue.

Résultats: L'acceptation pour l'usage inférieur de la microscopie de crachat pour le diagnostic, l'adhérence aux directives nationales de traitement de TB était haut dans des équipements de santé privée et publique. Les équipements privés de santé ont vu de manière significative plus de patients de TB, une moyenne de 51 patients par service de santé comparé à 23 patients dans les équipements de santé publique. Il y avait d'un meilleur accomplissement des disques dans les équipements de santé publique tandis que le criblage patient de contact était très bas dans les équipements publics et privés de santé, 13.1% et 12.2% respectivement. Le taux de succès de traitement était plus haut parmi des patients contrôlés dans les équipements privés de santé (83.7%) comparés à 78.6% dans les équipements de santé publique.

Conclusion: Équipements privés de santé adhérents aux directives nationales a eu une charge de cas patiente plus élevée de TB et améliorez les résultats de traitement que des équipements de santé publique dans l'état de Kaduna. PPM-DOTS devrait être mesuré-vers le haut et consolidé.

Mots clés: Tuberculose, mélange public-privé, DOTS, traitement, résultats

Tuberculosis remains a major public health problem, with Africa having a disproportionate burden of the disease. Home to only 11% of the world's population, the continent has more than 25% of the global burden of TB. The situation is worsening as a result of high prevalence of HIV.¹ Recognizing that the TB epidemic had more than quadrupled since 1990 in Africa, in 2005, African Ministers of Health declared TB a regional emergency.² They affirmed their commitment to ensuring universal access to treatment, care and support by 2015.³

Directly Observed Treatment Short course therapy (DOTS), the WHO recommended strategy remains the mainstay of TB control.^{4, 5} The global target for TB control through full DOTS expansion was the attainment of 70% case detection and attainment of 85% cure rate by 2005.⁶ Though critical, these targets are insufficient in achieving the TB-related Millennium Development Goals (MDGs) target of halting the spread and beginning to reverse the incidence of TB by 2015.⁷ Unfortunately, even these targets were not achieved, especially in Africa by the year 2005.⁵ One major constraint identified as limiting the attainment of these targets is the non involvement of the private sector in the TB control programmes. Thus, WHO observed that the target of 70% case detection would not be reached unless DOTS programmes continue to expand geographically as well as involve the private sector. Consequently, the current stop TB strategy includes calls for promotion of public-private partnership.⁸

Nigeria has the fourth highest TB burden in the world. In 2004, the incidence of TB in the country was estimated at 293/100, 000.⁹ Nigeria's TB Control Programme adopted the global targets of detecting 70% of the estimated TB cases, and curing 85% of the detected cases by the year 2005 using the directly observed treatment short course therapy (DOTS) strategy.¹⁰ While the latter target appears more readily achievable with Nigeria recording 73% treatment success by 2004 cohort, the case detection

rate remained at a low level of 22% compared to the global figure of 37%.⁷ Non expansion of DOTS to the private sector was identified as one of the main reasons militating against the attainment of the targets as the private sector is a major health care provider estimated to contribute 60% of the health expenditure in Nigeria.¹¹ Thus, in line with the WHO recommendation, Nigeria's TB programme has advocated promotion of the public private mix to expand coverage and improve case detection.

The Kaduna State TB program, one of the State TB programmes in Nigeria, in an effort to improve its case detection rate, which remained at a low level of 34.9% by 2002 started involving the faith-based private health facilities in her TB control program, beginning 2002. This public-private partnership has not been evaluated. This study was carried out with the objectives of comparing the roles of public and private health care facilities in TB programme and TB case management practices and treatment outcomes among patients managed in these health facilities.

Materials and Methods

Study area

Kaduna State, with an estimated population of 5.8 million people, in 23 Local Government Areas, is located in Nigeria's North-West geopolitical zone. There are socio-cultural differences between the northern part of the country where Hausa-Fulani Moslems predominate and the southern part of the State where six other ethnic groups, mainly Christians, reside. Agriculture is the mainstay of the economy. Poverty levels are high, especially in the southern rural areas of the state.

Kaduna State, with a 2005 HIV sero-prevalence rate of 5.6%, has the highest rate in the zone.¹² The combination of high poverty levels and the comparatively high HIV prevalence rates is fuelling the TB epidemic, especially in the southern part of the State where the burden of HIV is

disproportionately higher.

The public health sector of the state consists of a network of 601 Primary Health Care (PHC) clinics/dispensaries; general hospitals and a teaching hospital, while there are a total 252 registered private health facilities in the State.

The Kaduna State Tuberculosis and Leprosy Control Program (KDTBLCP) are implemented in 80 health facilities spread over all the LGAs of the state, including nine private health facilities. However, only four LGAs had both public and private health facilities providing DOTS services.

Methods

A comparative cross-sectional descriptive study design was used, comparing the public and private facilities providing DOTS services in Kaduna State TB program.

Health facilities selected for inclusion in the study had to meet the following criteria:

1. They had to be located in LGAs where both public and private health facilities were involved in the Kaduna State TB program and provide DOTS services.
2. The health facilities must be registered with the Kaduna State Ministry of Health and involved in DOTS services provision for at least 2 years

Four LGAs (Kaduna North, Kaduna South, Sanga and Lere) had both public and private health facilities providing DOTS services through the Kaduna State TB program. There were a total of 10 public and five private health facilities that made these inclusion criteria in these LGAs and were thus selected for the study. Data was collected from the 15 heads of these facilities and from a review of the case records of all the patients registered for treatment between the periods of 1st January 2003 to December 2004 in the facilities.

Following informed consent from the heads of the 15 selected health facilities they completed a structured self-administered close-ended questionnaire, obtaining data on DOTS-related resource availability and the role of their facilities in the DOTS program. In addition, using a checklist, TB patient management practices and treatment outcomes were obtained from a review of the patients' record cards. Information sought from the records included method used in diagnosis, duration of treatment and treatment outcome, categorized as defaulted, completed treatment or cured. All patients who either completed treatment or were cured were classified as treatment success.

The data was collected within a period of four weeks, in 2005, by four Local Government TB & Leprosy Supervisors (LGTBLS), who were trained on how to use the tools and were supervised while collecting the data. The data were processed and analyzed using SPSS soft ware (version 11). The data

were presented in tables and graphs as appropriate and summarized using percentages and means. Associations between variables were tested using χ^2 and Fisher exact test. A p value of <0.05 was considered a measure of significance of association. Missing values due to invalid recording were treated by a pair wise deletion (i.e., subject elimination from the analysis for variable where no data are available)

Results

Fifteen heads of health facilities were interviewed, 10 from the private and 5 from the public sector health facilities while a total of 492 patient case records were reviewed.

Resource availability for TB management

Seventy percent of the public health facilities were primary health care centers and 30% were secondary level health care facilities compared to 60% and 40% respectively for the private health facilities. The public and private health facilities had an average of 2.8 and 3.4 staff involved in TB case management respectively. (Table 1) All the public health facilities had laboratory services compared to only 50% of the private health facilities. The difference was not statistically significant ($P = .10$, fisher's exact test).

Roles in TB management

The roles of both public and private health facilities were found to be complementary and mixed in nature. What role each facility played largely depended on resource availability as there was no specific mandate given by the State TB control program. As shown in Table 2, 80% of the public health facilities could suspect and refer TB patients for diagnosis compared to 40% of the private facilities that only suspect and refer patients Forty percent of the public facilities could administer DOTS compared to 60% of the private facilities. The capacity to suspect, diagnose and give DOTS was higher in the private facilities, 80% compared to 40% of the public health facilities with same capacity. Patients' monitoring by sputum examination was done in only 50% of the public facilities compared to 100% of the private. Defaulter retrieval, provision of health education and contact screening activities were higher among the private health facilities than the public health facilities. were higher among the private health facilities than the public health facilities.

Patient management and treatment outcomes

A total of 492 TB patients' records cards were retrieved and analyzed on the case management and outcome of treatments, 234 (47.5%) from the 10 private public facilities and 258 (52.5%) from the 5

private health facilities. The mean number of TB patients seen during the period under review was 51 per private health facility compared to 23 patients per public health facility.

As shown in Table 3, overall, 63.0% of the patients were diagnosed by sputum Acid Fast Bacilli (AFB), the nationally recommended method for the diagnosis of TB. The public health facilities had a higher percentage of their TB patients diagnosed using sputum smear (77.8%) compared to only 49.4% among patients managed by the private providers. Chest x-ray as the only diagnostic tool was used for at least 10.8% of the total patients, with higher rates among patients managed in private health facilities (17.6%) than those managed in public health facilities (3.4%). Generally, the use of x-ray as one of the diagnostic tools was higher among patients managed by the private health facilities (50.6%) compared to (22.8%) among patient managed by the public health facilities.

Both public and private health facilities showed a very high level of adherence to the national guidelines of examining at least 3 sputum specimens for the diagnosis of TB. Three sputum samples were taken from 99.5% of patients managed; the rate among patients managed by both public and private providers was high at 99.6% and 99.5% respectively.

Of the 452 patients that had sputum smears done, 248 (54.3%) were smear positive. However, the public health facilities had higher rates of sputum smears that were positive (76.4%) compared to 35.1% found in the private health facilities (Table 4).

As shown in Table 5, the study found that overall, 99.8% of the patients were classified for treatment correctly with all the patients seen by the private facilities and 99.6% of patients seen in the public health facilities correctly classified. The observed difference was not statistically significant. (Fisher exact test = 0.47, $p > .05$). High rates of correct prescriptions made to patients were observed, with 99.4% of the patients receiving correct prescriptions. There were insignificant differences in correct prescriptions between the public (99.4%) and the

private (99.2%) health facilities (Fisher exact test = 0.54, $P > .05$). Treatment was given for correct duration of 8 months for 95.4% of all the patients. There was no significant difference in the correct duration of treatment for patients seen at public health facilities (94.1%) and those seen at private facilities (96.4%) ($X^2 = 1.3$, $df = 1$, p -value > 0.05)

While overall, patient monitoring was carried out for 97.4% of all the patients, there was a significant difference in-patient monitoring between patients managed by the public (90%) and those managed by the private health facilities (98.8%) ($X^2 = 18.2$ $df = 1$, $p < .05$).

Contact tracing and screening was found to be generally low. Only 12.6% of all the patients had their contacts screened, with comparable insignificant rates observed among both public and private health providers, 13.1% and 12.2% respectively. ($X^2 = 0.09$, $df = 1$, $p = .76$) (Table 5).

Overall, majority (63.0%) of the patient's record cards were correctly filled. A statistically significant higher rate of correct completion of patient record forms were recorded in the public health facilities (77.4%) compared to 49.8% in the private facilities.

Treatment outcome

Among all patients seen in both public and private health facilities a cure rate of 62.4%, treatment completion rate of 18.9% and a defaulter rate of 9.6% was attained. The cure rate among patients managed by the public health facilities was 64.1% compared to 60.9% among patients managed by the private health facilities. The defaulter rate was higher among patients managed by public health facilities (13.0%) compared to only 5.8% among patients managed by the private facilities (Table 6, Figure 1).

Treatment success, that is, the combination of cure rate and treatment completion was 81.3% among all patients. While the rate among patients managed by the private facilities (83.7%) was higher compared to 78.6% treatment success among those managed by the public facilities the difference was not statistically significant ($X^2 = 2.1$, $df = 1$, $p = .15$).

Table 1. Availability TB resources by type of facility

Variable	Resource availability		Overall (n = 15)
	Public (n = 10)	Private (n = 5)	
% Primary HF	70	60	66.7
% Secondary HF	30	40	33.3
Mean number of staff involved in TB patient management	2.8	3.4	3
% of health facilities with laboratory facilities	50	100	66.7

Table 2. Activities perform by health facility in TB program by type of facility

TB- related activity	% of health facilities performing a TB Activity	
	Public (n = 10) %	Private (n = 5) %
Suspect TB and refer for diagnosis	80	40
Administer drugs only (DOTS) for referred patients	40	60
Suspects, diagnose and give DOTS	40	80
Monitor by sputum examination	50	100
Defaulter Retrieval	80	100
Inform the program of all defaulter patients for retriever	70	100
Provide health education to patients on treatment	90	100
Do contact management of all cases	80	100

Table 3. Method of patient's diagnosis for PTB by type of facility in the selected LGAs (n = 489)

Type of health facility	Methods for diagnosis					Total (%)
	Sputum only (%)	AFB	Sputum chest x-ray (%)	AFB and Chest x-ray only (%)	Sputum, chest X-ray, ESR (%)	
Public	77.7		18.4	3.4	0.4	234 (100)
Private	49.4		33.0	17.6	0	255 (100)
Total	63.0		26.0	10.8	0.2	489 (100)

AFB: Acid-fast bacilli; PTB +ve: Pulmonary tuberculosis smear positive; PTB –ve: Pulmonary tuberculosis smear negative; EPTB: Extra-pulmonary tuberculosis

Table 4. Type of TB disease (patient's diagnosis) by type facility attended

Type of health facility	Type of TB disease			Total (%)
	PTB +ve (%)	PTB –ve (%)	EPTB (%)	
Public	162(76.4)	49 (23.1)	1 (0.5)	212 (100)
Private	86 (35.1)	157(64.1)	2 (0.8)	245 (100)
Total	248 (54.3)	206 (45.1)	3 (0.6)	457 (100)

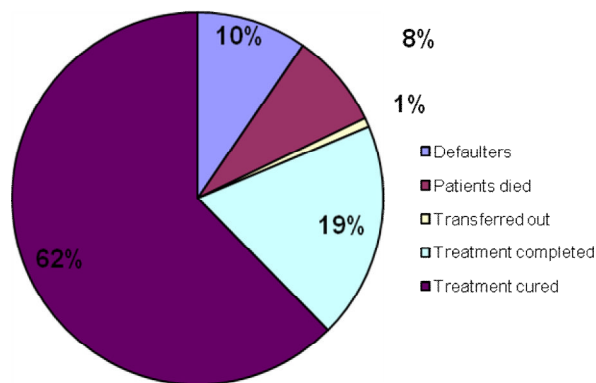
PTB +ve: Pulmonary tuberculosis smear positive; PTB –ve: Pulmonary tuberculosis smear negative; EPTB: Extra-pulmonary tuberculosis

Table 5. TB management practices among public and private health facilities

TB management practices	% of correct practice	
	Public health facility	Private health facility
3 sputum samples taken for diagnosis	99.5	99.6
Classification of patients	99.6	100
Drug prescription	99.4	99.2
Duration of treatment	94.1	96.4
Patient monitoring	90.0	98.8
Conduct of contact screening	13.1	12.2
Treatment card filled in correctly	77.4	49.8

Table 6. Outcomes of treatment by type of health facility providing DOTS services (n = 492)

Type of health facility	Outcome of treatment					Total (%)
	%Defaulted	%Died	%Transferred out	%Treatment completed	%Cured	
Public	13.7	6.8	0.9	14.5	64.1	234 (100)
Private	5.8	9.7	0.8	22.9	60.9	258 (100)
Overall	9.6	8.3	0.8	18.9	62.4	492 (100)

Figure 1. Outcome of treatment among all patients

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Discussion

The study found that both public and private health facilities in Kaduna State had complementary/mix roles in the TB program. The private health care facilities saw significantly more patients, had more resources and had better treatment outcomes than the public health care facilities.

The roles played by the health facilities on TB management depends on available resources, human resources and laboratory facilities largely determined the TB services provided by the two categories of health facilities in the TB program. Facilities with laboratory services were better able to suspect, diagnose TB cases and administer DOTS. The higher case load managed by the private sector found in this study is similar to findings on the contribution of the private health facilities to the case finding in studies in New Delhi, and Nairobi. Given the higher numbers of patients they see, the involvement of the private health facilities will no doubt contribute to an increase in case finding.

Except for the high rates of use of x-rays for diagnosis, by the private sector, there was generally adherence to standard of practice by both public and private health facilities as stipulated national TB guideline⁹ In most cases, the number of sputum samples taken for examination, patients' classification, duration of treatment and patient monitoring were in line with the national guideline. This high level of adherence to patient management guidelines is comparable to the evaluation of pilot project for PPM DOTS in Onitsha, Nigeria.

Sputum microscopy is the main diagnostic tool for pulmonary tuberculosis (PTB), but only 67.0% of all the patients had sputum microscopy as their first diagnostic tool. The significantly lower level of use of sputum microscopy as the only diagnostic tool among private health care practitioners is comparable to the findings of a study conducted in Manila, Philippines¹³ The very low rates of contact screening of index cases

in both public and private health facilities have serious negative implication on early case finding and the provision of Isoniazide prophylaxis among contacts aged less than five years.

The correct completion of patients' treatment cards is crucial to the patients monitoring and evaluation. The significantly lower rate of correct completion of patient records observed in the private health facilities may possibly be due to high workload at the private health facilities since more cases are managed in those facilities.

The treatment outcome among all patients was 62.0% cure rate, 18.9% treatment completion and 9.6% defaulter rate; similar figures were documented nationally, 69.0% cure rate, 12.0% treatment completion and 10.0% defaulter rate. While cure rate was higher among patients managed in the public health facility, a comparatively higher defaulter rate was observed among their patients. This contrasts with the findings of a study in Ballabgarh, North India where higher cure and defaulter rates were observed among patients managed by the private health sector.¹⁴ However another study in India showed no significant different in the out come of treatment between the public and private health facilities.¹⁵

The overall treatment success of 81.3% compares favorably with both the Kaduna State and national figures of 80.4% and 81.0% respectively. Similar to a study in India, this study found higher treatment success rates among patients managed by the private sector.¹⁶ However, in contrast to the findings of this study, another Indian study documented a higher defaulter rate among patients managed in the private health facilities compared to the public health facilities¹⁴

The study has documented a high level of adherence among both public and private health facilities to the National TB guidelines. However, the public sector managed significantly more cases of TB compared to the public health facilities with better treatment outcomes. Based on this finding we recommend scaling up of the expansion of the TB programme to private health facilities for improvement of case detection. However, there is need to improve supervision to private health care facilities to ensure all patients' contacts are screened and patients' treatment cards are correctly filled. Also, there is need for refresher training of private health care providers on correct diagnosis of TB so as to limit unnecessarily expensive diagnostic tests.

Limitations

The Private DOTS services providers used in Kaduna State were all faith-based, non-profit health facilities and so there was no opportunity to compare the TB programming and TB treatment outcomes of the public facilities with those of private for profit

organizations. Also, the accuracy of secondary data collected from patient's record card for the study depended on the accuracy and completeness of the record cards as filled in by the health workers in the facilities.

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