

Strategic Engagement of Private Facilities to Increase Public-Private Mix (PPM) Contribution to Nigeria Tuberculosis Case Notification

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How to cite this paper: Chijioke-Akaniro, O., Ubochioma, E., Omoniyi, A., Omosebi, O., Olarewaju, O., Etolue, M., Asuke, S., Aniwada, E., Ndubuisi, A.U., Ombeka, V., Agbaje, A., Lawanson, A. and Anyaike, C. (2022) Strategic Engagement of Private Facilities to Increase Public-Private Mix (PPM) Contribution to Nigeria Tuberculosis Case Notification. *Journal of Tuberculosis Research*, 10, 99-110.

<https://doi.org/10.4236/jtr.2022.103008>

Received: June 26, 2022

Accepted: August 22, 2022

Published: August 25, 2022

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Abstract

Introduction: Finding the missing Tuberculosis (TB) cases remains the single most important priority for TB control in Nigeria. Between 66% - 92% of all cases of respiratory diseases including those with symptoms suggestive of TB are first seen by private health providers. Dependable, quality surveillance systems and notification are key roles in health services delivery, particularly as it is related to TB control. However, poor notification has been a challenge. This study was to assess the contribution of the public private mix (PPM) to Nigeria Tuberculosis national case notification. **Methods:** It was a national cross-sectional study. Data were extracted from the National database and reviewed. Private facilities were engaged in 2017 and assessed over 2018-2020. Interventions included: enrolling private practitioners (Private-For-Profit, Faith Based Organization, Private Medicine Vendors and Community Pharmacists), engaging a private standalone Laboratory for Gene Xpert testing within the network of private facilities, use of Mobile App for easy screening and reporting, instituting a HUB and spoke, and incentives to private providers for participating. Each private provider had a customized approach. Trend analysis was performed using Cochran-Armitage χ^2 test for linear trends. Level of significance was at a p value of <0.05. **Results:** Total case notification increased from 104,904 cases in 2017 to 138,591 in 2020. There were 2.0% increase in 2018, 13.0% in 2019 and 15.0% in 2020 ($p < 0.001$). PPM contribution to case notification increased from 10,699 cases in 2017 to 12,625 in 2018, then 17,250

in 2019 and 38,865 in 2020. There were 18.0% increase in 2018, 36.6% in 2019 and 125.3% increase in 2020 ($p < 0.001$). **Conclusion:** Effective engagement of the private sector in TB control efforts in Nigeria using a variety of approaches resulting in improved TB notification is possible. The National TB Programme should engage all private practitioners such that each practitioner will practice at least one TB service model.

Keywords

Strategic Engagement, Public-Private Mix, Case Notification, Tuberculosis, Nigeria

1. Introduction

Tuberculosis (TB) is a key public health problem globally. Despite management advances it remains among the leading causes of death from a curable infection worldwide [1]. One-fourth (1.7 billion) of the global community is estimated to be latently infected with TB [2]. In 2020, approximately 10.0 million people developed active TB disease and an estimated 1.5 million died of TB [1]. Also 3.6 million of those who had TB were “missed” as they were not captured by the health systems. Of concern, is the fact that a person with TB disease can infect 10 to 15 persons he or she comes into contact with [1] [2]. This implies that each missed TB case contributes to the current TB burden thereby compounding the challenge to end TB.

Nigeria is among the fourteen countries with the highest TB, Multi-Drug Resistant TB (MDR-TB) and Tuberculosis Human Immunodeficiency Virus (TB HIV) burden, it is among the eight countries contributing two-thirds of the global total TB burden, and is ranked sixth among the high burden countries globally and first in Africa [3] [4]. In 2020, it was projected that 452,000 persons fell ill with TB in Nigeria, yet only about 138,591 (all cases) were notified [1]. This means that about 75 percent of estimated TB cases were not diagnosed, treated and/or notified annually. Also there were estimated 323,000 missing TB cases equivalent to 12% of the total global TB cases not notified [4]. This is disturbing as complete reporting and quality surveillance systems for TB are central for the planning, implementation, and evaluation of the control strategies and for determining the real burden of TB [5]. Despite these, TB service delivery in Nigeria covered only 26% of all health care facilities with only 5% of them being private health care facilities [4].

In developing countries such as Nigeria, private healthcare providers are very important stakeholders in the health care delivery system [6]. Importantly, the private health sector contributes as high as 70% to the health care delivery system in Nigeria [7]. Evidence has shown that 66% - 92% of all cases of respiratory diseases including those with symptoms suggestive of tuberculosis are first seen by the private health care providers [8] [9] [10]. Thus, there are a lot of missed

opportunities with respect to TB case finding in the private health sector due to non-engagement in TB control [6]. Prior to 2015, Nigeria in her fight against TB, leveraged on the fourth (4th) strategy of the global stop TB strategy which is to engage all health care providers using Public-private Mix approach in the provision of TB services. In spite of all efforts, private sector contribution to case notification remained at 14% in the country where over 60% of Nigerians access medical care in the private sector [11].

Dependable, quality surveillance systems and notification are key roles of public health as they provide opportunities for evidence-based decision-making, planning of interventions and health care service delivery [12]. Mandatory TB notification is an integral element of regulatory frameworks for the implementation of the end TB strategy [13] [14]. However, weak notification systems have been a challenge. It has led to underestimation of the true burden of the disease, implementation of inappropriate control strategies and misallocation of resources. Underreporting for TB is a global problem and responsible for low case notification of TB across the globe and for Nigeria in particular [14] [15] [16].

Some identified factors for TB underreporting and poor notification are: inadequate training of health care worker; unavailability of National TB Programme reporting and difficult reporting tools; weak collaboration and coordination between TB programs, private and public sector; high workload; weak mechanisms for communication and feedback; no mechanism or responsible body for enforcement of TB reporting; patient's characteristics, disease type, and concerns about the confidentiality and stigma [14] [17] [18] [19].

Finding the missing TB cases remains the single most important priority for TB control in Nigeria [20]. This informed the introduction of PPM. Conversely, PPM models for TB have been established for over a decade and have resulted in a growing contribution of the private sector to reported TB cases—about 10% - 40% of notifications in several high burden countries [21]. Under PPM, the private sector provides either early and complete referral, or early and accurate diagnosis, for TB symptomatic. However, PPM comes with challenges which include: the heterogeneity of provider types, most with no system for tracing patients during long treatment; administrative challenges for quality assurance, payments, drug distribution, reporting, fragmented providers and the lack of interest by providers [22]. The statistics on underreporting among private health care practitioners are varied depending on location, design and scope of study and mandatory notification has been shown to be high in some studies [23] [24] [25].

Private practitioners including Faith Based organizations (FBOs), Patent Medicine Vendors (PMVs), Community Pharmacists (CPs), Traditional Birth attendants (TBAs) are well trusted by clients for services and are most times first contact places for sick patients in the local communities. In a private sector-driven health system such as Nigeria, the private health providers are very important stakeholders in tuberculosis diagnosis and management. Studies has shown that awareness and practice of mandatory TB notification was reported to be high among private health care workers; 73% in Chennai, India, [23]. 98% and 84% in

Karachi, Pakistan, and Alappuzha, India [24] [25]. However, lack of knowledge on reporting systems, procedures, processes, and coordination with the public health care system was reported. Other reasons identified for the low contribution of private health practitioners to TB case notification included cumbersome TB reporting tools, existing TB reporting tools that do not capture patients referred by private health practitioners, and low engagement of private health practitioners in only 1% and 18.6% of private for profit and private nonprofit health care facilities [26].

Preceding the onset of the COVID-19 pandemic, the notification of TB in Nigeria was suboptimal. Emergence of the pandemic had socio-economic impacts, disrupted routine health services and affected the achievement of TB set targets including the United Nations Sustainable Development Goals (SDGs). A Stop TB Partnership report based on a modelling analysis foretold that the global response to the COVID-19 pandemic is likely to have drastic detrimental consequences for TB services [27]. As the pandemic in 2020 was interrupting service provision as well as its control measures in Nigeria, there was reduction in public clinic attendance but a rise in patronage of the referral entities—Patent Medicine Vendors (PMVs), Community Pharmacists (CPs), Traditional Birth attendants (TBAs) etc., resulting in an increase in referrals from these categories of providers. This study was to assess the contribution of PPM to Nigeria national case notification on Tuberculosis.

2. Methods

This was a national study involving 36 states of the country and Federal Capital Territory Abuja. A cross-sectional study was done using de-identified programme data extracted from the National Tuberculosis, Leprosy Control Programme (NTBLCP) database. The national data was reviewed and subsequent engagement of the private practitioners to increase coverage and improve TB services including case notification was done. The year 2017 was used as baseline and intervention was assessed over 3 years (2018-2020). The study was in 2017 to 2022.

A new strategy (one-size-does-not-fit-all approach) was adopted for PPM intervention using Global Funds, while USAID also engaged the Shops-plus project in 2 highest burden states; Lagos and Kano. Strategies utilized included: recruiting and training of private providers, providing support for notification, increasing access to diagnostic technologies, and providing standardized treatment as well as treatment support to patients. The strategy includes; enrolling private practitioners (Private-For-Profit, Faith Based Organization, Private Medicine Vendors, and Community Pharmacists), engaging a private standalone Laboratories for Gene Xpert testing and use of a Mobile App for easy screening and reporting. Private practitioners were engaged in at least one TB service model which includes; identification and referral, identification and diagnosis, diagnosis only or diagnosis and treatment.

Incentives were paid to private practitioners when presumptive and TB patients were identified. Use of Mobile App for easy screening and reporting was

established. Memoranda of Understanding (MOUs) were signed between the private practitioners and the implementing partners. The referral centres were arranged in a hub and spoke manner with the PMVs, CPs, and TBAs being the spokes and the engaged private facility nearby serving as the hub for diagnosis and treatment of the presumptive cases.

This was an improvement on approaches used previously and it involved: actively engaging the target population of providers during the project design and continued consultation with them on an ongoing basis, in-person support to help patients transverse the complex health care system; institution of diagnostic sites within their own network of private facilities to increase the convenience for providers and patients, introduction of daily treatment option to providers and patients, using a well-structured hub and spoke approach, giving incentives to private providers for participating in the network.

At the onset of COVID-19, the programme took advantage of private practitioners who pre-engaged in 2017/2018 when the present PPM engagement strategy was launched. During COVID-19 lockdown interventions included; provision of a pass to allow essential staff move around, virtual meetings with state programme managers to attend to pressing issues, stocking up of medicines at the state stores, providing facilities and patients medicines for a longer period (5 months), improved support for private facilities, providing Personal Protective Equipment (PPE) to private providers, supporting facilities to institute Infection Prevention and Control (IPC) measures, virtual capacity building was done for providers, patient triage & integrating screening for TB and COVID-19 at Out Patient Departments (OPDs), institutionalizing TB services in the private sector, radiological diagnosis of TB and COVID-19, virtual mentoring and supervision of private providers and facility support through telephone calls, WhatsApp and Video calls.

Data collected were entered in Excel. It was exported, edited and analysed using Statistical Package for Social sciences version 25 (IBM Corp, Armonk, NY, USA). Trend analysis was performed using Cochran-Armitage χ^2 test for linear trends. Level of significance was at a p value of <0.05. Data was summarized using frequency and percentages. Tables and charts were used in presenting the data. Informed consent was not required since the study was a non-research programme evaluation of pooled records of patients from National database with no direct contact with clients. However confidentiality and security of the data were assured.

3. Results

Table 1 shows the trend in total case notification between 2017 and 2020 and the contribution of PPM to the case notification. Total case notification increased from 104,904 cases in 2017 to 138,591 in 2020. There was a 2.0% increase in 2018, 13.0% in 2019 and 15.0% in 2020. These changes over the years were statistically significant with $p < 0.001$. PPM contribution to case notification increased from 10,699 cases in 2017 to 12,625 in 2018 then to 17,250 in 2019 and

38,865 in 2020. This was an 18.0% increase in 2018, 36.6% in 2019 and 125.3% in 2020. These changes over the three years were statistically significant with $p < 0.001$.

Figure 1 shows the trend in percentage of PPM contribution to the national case notification. There was a dip of about 4% from year 2016 to 2017 the baseline year, however this was reversed by 2019 and nearly doubled between 2019 and 2020 to 26%.

Figure 2 shows the trend of total annual case notification in numbers and the numbers notified by PPM between 2016 and 2021. Both have been on upward trend since 2017 (**Figure 3**).

Table 1. Distribution of TB case parameters 2017 to 2020.

Variables	2017 (Baseline)	Number and percentage 2018 to 2020			Total (2018-2020)
		2018	2019	2020	
Total case notification	104,904	106,533	120,266	138,591	365,390
<i>Percentage of total (%)</i>		29.2	32.9	37.9	100.0
<i>Percentage increase (%)</i>		2.0	13.0	15.0	
$\chi^2 = 6328.47, p < 0.001$					
PPM contribution	10,699	12,625	17,250	38,865	68,740
<i>Percentage of total (%)</i>		18.4	25.1	56.5	100.0
<i>Percentage increase (%)</i>		18.0	36.6	125.3	
$\chi^2 = 22537.24, p < 0.001$					

NB: 1. Percentage increase—approximate percentage change from the previous year. 2. Year 2017 was the reference or baseline year before intervention. 3. Total aggregate from year 2018 to 2020.

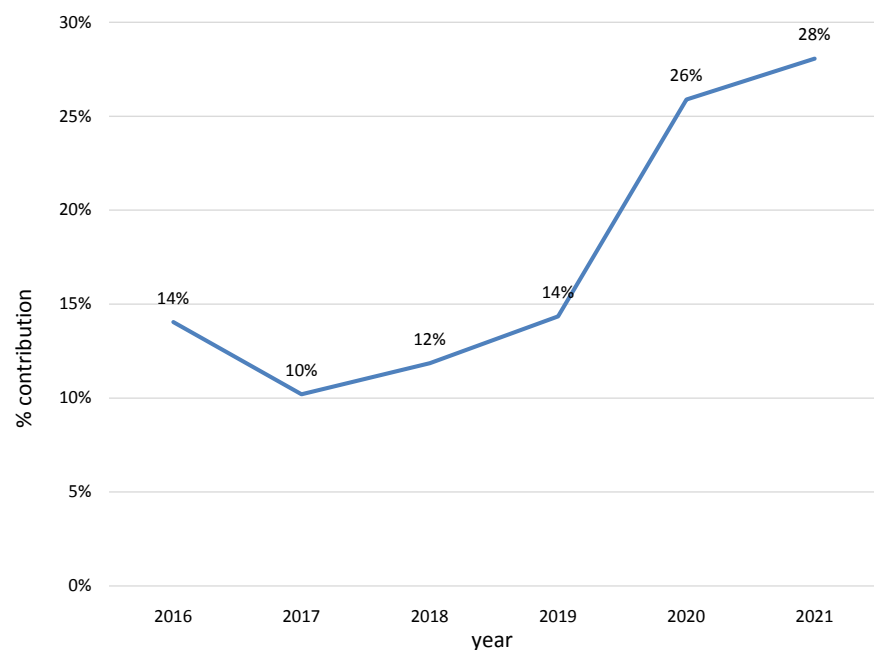


Figure 1. Trend in % of PPM contribution to National.

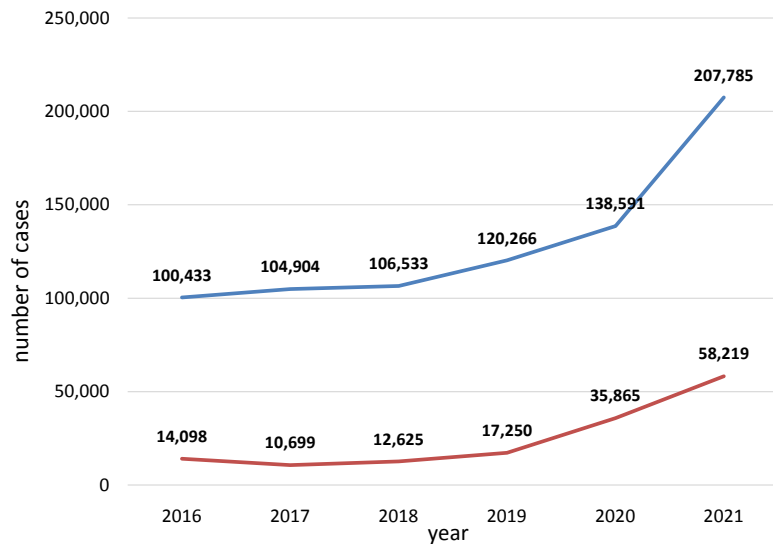


Figure 2. Trend of PPM contribution to national case notification.

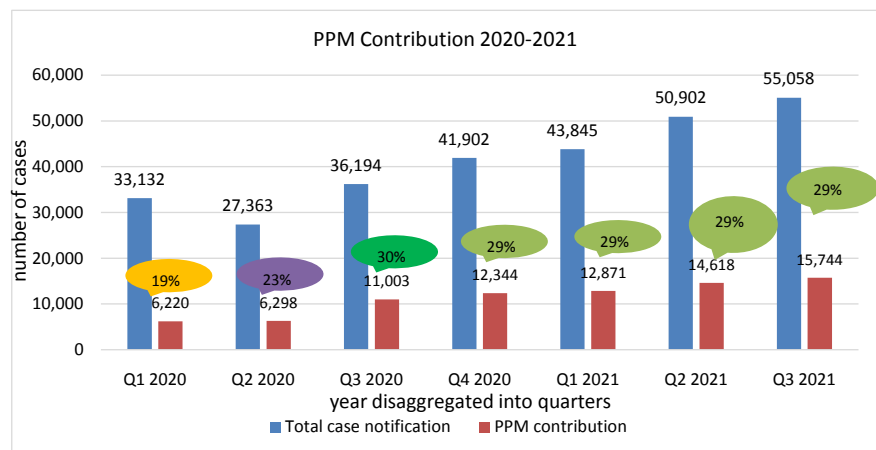


Figure 3. Trend of quarterly PPM case contribution to the national case finding.

4. Discussion

Globally TB notification in high-incidence countries is generally low [1]. In Nigeria, TB case notifications have been poor, particularly from the private sector. This is because priority in the past was given to strengthening the public sector TB notification with less emphasis given to the private sector. Also, no lasting partnerships with private sector providers was created. Most private-sector TB patients were not notified to the NTBLCP nor their treatment outcome recorded. More so, even though mandatory notification of TB has been in operation, limited private providers complied with this practice. Varied reasons were attributable to this. They include unawareness of the mandate; did not have appropriate forms and contacts to perform the task; refused due to concerns about patient confidentiality; or did not allocate time to do so. These reasons were responsible for low notifications in previous years. For example in year 2016 to 2017, in spite of all efforts, private sector contribution to case notification re-

mained at 14% in a country where 60% of Nigerians access medical care in the private sector [28].

Using the strategy (one-size-does-not-fit-all approach) employed in current study, the contribution of PPM to national case notification significantly improved. The country's total case notification increased gradually in the years 2017 to 2019 with a sharp rise in 2020 of 15% compared to the previous year. PPM improved by 125% compared to the previous year (2019 to 2020) and contributed 26% to the national case notification which is close to the NTBLCP target of 30% for private practitioners in the 2015-2020 national strategic plan [29].

Nigeria has a weak health system, with a largely unregulated private health sector. Due to its diversity the services rendered by this sector are often substandard in nature [30]. A one fit all approach could not work for all the members of diverse group. Non-engagement of this large sector could have its consequences on the control of tuberculosis, especially in a low resource country such as Nigeria [31]. I think no result was discussed or related to in this paragraph, it was basically the non-engagement of the private health sector that was.

The finding from this study is in line with the findings of other studies, which noted that effective collaboration with the private providers can increase the TB case notification if well harnessed [28] [32] [33]. A study on assessment of the contributions of Private-Provider Engagement in Tuberculosis case finding and notification in South West Nigeria reported that contributions of Global Fund project on PPM to TB notification were 16% in Ogun State, 35% in Ondo state, 38% in Osun State and 34% in Oyo state [5]. In Pakistan, PPM model implementation contributed 25% to the national TB case notification [34]. Also in Pune, India private practitioners involvement accounted for 20% of the total TB cases notified [35]. All these findings are consistent with countries that have prioritized the PPM model for an increasing trend in TB case notification to their national TB control programs [36]. Also WHO-reported that the contribution of PPMs to TB notification in countries ranged between 5% and 56% [36]. A prospective cohort study in Chennai India documented that notifications from PPM comprised approximately 10% of TB and DR-TB notifications during a project's period [28]. A study based on literature search on notification system reported low notification rate in Republic of Korea, Pakistan, and Nigeria [37]. It was attributed to low knowledge of providers, poor engagement of private providers on TB, lack of time, concerns about confidentiality and poor knowledge of the reporting procedure. This is comparable to what has been found in Pakistan and other a high burden country like Nigeria [34] [38].

The main limitation of this study is that some private facilities were already involved in TB notification before the year 2017 thereby making it difficult to attribute the entire observed increased notification to the current intervention. This may be due to increase in scope or changes in the approaches of the already participating facilities. However, baseline data were collected before the start of the intervention to form reference point for comparison. Also the figures were

extracted using aggregate data which is expected to have minor fluctuations as compared to individual facility data

5. Conclusion

The project demonstrated that effective participation of the private sector in TB control efforts in Nigeria is possible and can yield significant benefits to private providers and their patients as well as the public sector by increasing TB notification. The PPM strategy was successful in terms of finding the missing cases in country therefore, the NTBLCP should work on 100% engagement of the private health sector such that each practitioner will practice at least one TB service model (Identification and referral, Identification and diagnosis, Diagnosis only or Diagnosis and treatment). Also there is the need to optimize the use of private standalone Laboratories for Gene Xpert testing which has the potential to effectively expand the public sector's service delivery capacity.

Acknowledgements

We thank The Global Funds to Fight Aids, Tuberculosis and Malaria, the USAID, WHO and the entire National Tuberculosis, leprosy and Buruli Ulcer Control Programme and Partners for making this project possible.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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