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Drug resistant tuberculosis treatment service alignment with health seeking behaviour in selected states in Nigeria

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Nigeria is among the fourteen countries with the highest MDR-TB burden, and accounts for 12% of the global gap in DRTB diagnosis. Several control strategies have been put in place to ensure that all DRTB patients are diagnosed and placed on treatment, but this has not significantly closed this diagnostic gap. This study seeks to identify the drug resistant TB treatment service alignment with health seeking behavior of patients. The cross-sectional study under program implementation was carried out in 14 states among public and private healthcare facilities across different levels of care from June 2020 to December 2021. Data collection was carried out using an open-ended questionnaire and analyzed using Tableau 15 (version 2021.4 Germany). In public sector primary facilities only 14% facilities provide DR-TB services. States with highest availability of DRTB services do not have patients who first sought care at this level. In the secondary facilities, 14% of states have about 50% of their facilities providing DR-TB treatment services, and this aligns with where patients are seeking care in these states. For tertiary facilities, 28% of states have ≥ 50% facilities with DR-TB treatment services, but most patients do not first seek care at this level. The DRTB service availability in the private sector is low across all levels of care. There is a misalignment of availability of DR-TB services with facilities where patients first seek care. This insufficient and inequitable distribution should be a priority for TB control in order to close the DRTB notification and enrolment gap in Nigeria.

Key words: Patient pathway analysis, drug resistant tuberculosis, treatment service analysis, health seeking behavior.

INTRODUCTION

In Nigeria, an estimated 21,000 people were actively infected with drug resistant tuberculosis (DR-TB) in 2018, and this threatens to reverse the gains achieved with the National TB prevention and control (WHO, 2019b, Madhu,

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2019). Nigeria accounts for 4% of the global DR-TB burden and 27% of the DRTB incidence in Africa (WHO, 2019a).

The World Health Organization (WHO) estimates that 4.3% of all new TB cases and 15% of all recurrent TB cases in Nigeria are drug resistant TB strains (WHO, 2019a). The incidence of DR-TB from other studies is much higher than the WHO estimate (Madhu, 2019). In a meta-analysis of 8,002 adult TB patients from across Nigeria, drug resistance was reported as 32% for new TB cases (734/2892) and 53% for previously treated TB cases (1467/5020) (Onyedum et al., 2017). Similarly, in Lagos State the incidence of DR-TB amongst new TB cases was 32% (9/28) and 66% (58/88) amongst previously treated TB cases (Gehre et al., 2016).

Several control strategies have been put in place to ensure that all DR-TB patients are diagnosed and placed on treatment. As far back as 2012, Nigeria commenced the expansion of molecular diagnostic methods for TB and in 2016, Nigeria adopted the Xpert MTB/Rif assay as the primary diagnostic modality for TB. Currently, Nigeria has over 500 Xpert MTB/Rif assay platforms spread across the country, and in 2018, 63% of all diagnosed TB cases had access to rapid WHO recommended molecular tests as at the time of diagnosis (WHO, 2019a). Nigeria also scaled-up the availability of DR-TB treatment centers in a bid to ensure that all diagnosed DR-TB patients were immediately placed on treatment. In 2015, the country also commenced the community treatment of DR-TB patients and decentralized the care of DR-TB patients to ensure adequate access to DR-TB care. The country has also adopted all oral regimen for DR-TB care and phased out the less effective but more toxic injectable based regimens in a bid to enhance treatment outcomes.

Despite all the strategies put in place, the notification rates for DRTB has remained low. The WHO estimates that only 11% of people with DR-TB in Nigeria were diagnosed and only 9% placed on treatment in 2018, compared to the 39% diagnosis and 32% treatment rates globally (WHO, 2019a). Cumulatively, out of the 21,000 estimated DR-TB patients in Nigeria, only 2,275 were diagnosed in 2018, equivalent to a 90% gap in notification (NTBLCP, 2019). Nigeria contributes 12% of the global DR-TB diagnosis gap (gap between the number of new cases reported and the estimated incident cases). Consistent low rates of DR-TB case notification and treatment coverage reflect that accessing diagnosis and treatment for drug-resistant tuberculosis in Nigeria remains a challenge, even though it is provided free of charge to patients (Oga-Omenka et al., 2020). Consequently, the gaps in the diagnosis and treatment of DR-TB patients contribute to the difficulty in achieving the goals of the End TB Strategy.

Furthermore, the management DR-TB is more complex than the management of Drug Susceptible TB (DS-TB). DR-TB treatment requires the use of second-line TB drugs, which are often less effective, more toxic, more costly with lower success rates compared to the standard DS-TB therapy (Gunther et al., 2015; Lönnroth et al., 2015). There have been several advances made in the management of drug resistant TB, particularly in the introduction of new drugs and regimen that are safer and more effective than the traditional second-line drugs used for the management of DRTB. In 2017, Nigeria adopted the use of the shorter treatment regimen for DR-TB, and in 2019 adopted the all-oral regimen for DRTB care. Several studies are also ongoing currently to identify safer and more effective treatment regimen for drug resistant tuberculosis. Despite all these interventions, however, the treatment success rates for DR-TB patients remained at 80% for patients enrolled in 2018, which is significantly lower than the 90% treatment success rates for DSTB patients enrolled on care within the same period (NTBLCP, 2020). Understanding the patient pathway analysis for drug resistant TB patients may be the first step in identifying the underlying factors responsible for low uptake of DR-TB services and help in the development of control strategies for DR-TB.

Health service delivery in Nigeria is provided by the public and private sectors, and each of these sectors is organized into primary, secondary, and tertiary levels. The National TB Programs (NTP) focus for TB case detection and management was initially largely concentrated in the public health sector (The World Bank, 2016). However, the majority of Nigerians (about 60%) report that they seek health care from the private sector (IMF, 2019; WHO, 2018), and the STOP TB strategy recommends expanding TB service provision to the private sector. In recent years, the NTP has stepped up its engagement of the private sector through a public-private mix (PPM) approach. This private sector engagement is playing an increasingly important role in TB control in Nigeria.

Adaptation of strategies and interventions to national and local contexts is pivotal for effective TB control especially the control of Drug Resistant TB (WHO, 2015). This can only be achieved with a detailed understanding of DR-TB Treatment Service availability in health facilities alignment with health seeking behaviour of suspected and confirmed DRTB cases. Misalignment could result in delayed diagnosis and enrolment on care which further compounds the ordeal of patients with DR-TB (Braveman, 2003). This study assessed DR-TB Treatment Service Alignment with health seeking behaviour in health facilities in Nigeria.

METHODS

Study setting

There are three levels of government in Nigeria: Federal, State and Local Government levels. There are 36 states and a Federal Capital Territory (FCT), which are organized into six geopolitical zones (North-West, North-East, North-Central, South-West, South-East and South-South). There are widely varied regional health

indices with the southern region generally having better health indices than the northern region. The number of LGAs in each state is variable, ranging from 8 to 44. There are a total of 774 LGAs in the country. The official language of Nigeria is English, although there are more than 250 ethnic groups with diverse languages and religious faiths. Nigeria's economy is heavily dependent on oil exports. The country is a predominantly young country, with an estimated 43.9% of the population under the age of 15 and 19.3% between the ages of 15 and 24. The life expectancy for both sexes is 55.8 years. The public health service delivery is organized into primary, secondary, and tertiary levels with responsibilities for primary health care ascribed to local governments, secondary care to states and tertiary care to the federal level.

Tuberculosis service provision is in line with the three levels of governance in the country: national, state, and local government area (LGA). The LGA is the basic management unit of the NTBLCP. A declaration in 2017 by the National Council on Health (NCH) which is the highest health decision making mechanism in Nigeria made TB reporting mandatory for all health professionals including private practitioners (NTBLCP, 2017).

As of 2019, there were a total of 5,389 DOTS centres providing TB services in Nigeria, and 398 GeneXpert MTB-Rif machines in use, across all 36 states and the FCT. All LGAs have at least one DOTS treatment facility (NTBLCP, 2020).

The study was carried out in 14 states (8 in northern regions and 6 in the southern regions). These 14 states are states where the USAID TB LON 1&2 project is implemented, and a total of 92 facilities were selected using a stratified sampling technique to ensure representation of each facility type in the study.

Study design

This was a program implementation, facility-based cross-sectional study from June 2020 to May 2021.

Data collection and tools

Data collection was conducted by trained and proficient personnel to ensure good quality data.

Data was collected using a proforma to extract relevant data from the National TB and Leprosy Control Program (NTBLCP) registers at facilities. The data extracted includes facility name, type of provider (public or private), level of care (primary, secondary, or tertiary), availability of TB diagnostic tool(s) in the facility (Gene Xpert, Trunat, TB Lamp, Culture) as well as available TB treatment services for DR-TB. This was complemented by a desk review of NTBLCP database.

Data analysis

Data was collected, collated, and cleaned using Microsoft Excel. The analysis was done in Tableau 15 (version 2021.4 Germany) for easy visualization and interpretation. The data visualizations show distribution of DR-TB service availability, availability of diagnostics, and DR-TB treatment provision disaggregated by level of care of the health system as well as availability of diagnostics in public and private sectors.

Ethical consideration

Ethical clearance was obtained from National Research and Ethics Committee. Written informed consent, confidentiality, voluntary participation, and permission from appropriate authorities were observed where and when necessary.

RESULTS

DR-TB service provision

Table 1 shows that for the public sector; 29 (0.27%) primary, 38 (8.86%) secondary and 10 (21.28%) tertiary level of facilities provide DR-TB services. Similarly for the private sector, 8 (0.18%) primary, 6 (1.12%) secondary and 0 (0.0%) tertiary facilities provide DR-TB services. DR-TB service provision was defined as the facility treating or managing a DR-TB patient in the past 5 years before the study.

Molecular WHO recommended rapid Diagnostic (mWRD) coverage

The availability of mWRDs is summarized in Figures 1 and 2.

In the public health facilities, mWRDs are mostly available at the tertiary facilities. Of the fourteen states, eight states (57%) have GeneXpert in all their tertiary facilities. In the secondary facilities, GeneXpert availability is very low with only two states having over 50% of its secondary healthcare facilities with the Xpert platforms. In the primary facilities, diagnostic availability is very low with most states having less than 2% of its facilities with GeneXpert platforms.

In the private healthcare facilities, the availability of diagnostics at different levels is much lower when compared with the facilities in the public sector. The availability of mWRD is poor at all levels, with the lowest numbers in the tertiary facilities.

DR-TB treatment service alignment in the public sector

Patient health care seeking for DRTB services was aligned with the provision of these services in the public sector at different levels. At the primary level, only two (14%) states have DR-TB treatment available in facilities where the patients first sought DR-TB service provision (Figure 3).

At the secondary level, two (14%) states have DR-TB treatment services available for over 50% of their facilities, and this aligns with where patients are seeking care in these states (60 and 72%, respectively). However, there are 4 (29%) states with up to 21% DR-TB treatment service available and no patient first seeking care at this level (Figure 4).

For the tertiary facilities, patients do not first seek care at this level in 4 states (Rivers, Taraba-100%, Anambra-67%, and Benue-50%) that have the highest proportion of facilities with DR-TB treatment services. There is minimal alignment in 2 states, Kaduna and Plateau with 14 and 100% of facilities having DR-TB treatment available, respectively and 20 and 100% of patients' first seeking care at this level, respectively (Figure 5).

Table 1. Overall distribution of health facilities and DR-TB services by sector and level of care in studied states.

Sector and level	Health facilities (Total)	No. of facilities with DR-TB services	% Facilities with DR-TB services
Public			
Primary	10746	29	0.27
Secondary	429	38	8.86
Tertiary	47	10	21.28
Private			
Primary	4581	8	0.18
Secondary	535	6	1.12
Tertiary	41	0	0.00

Source: Data collected from 14 states used for the study

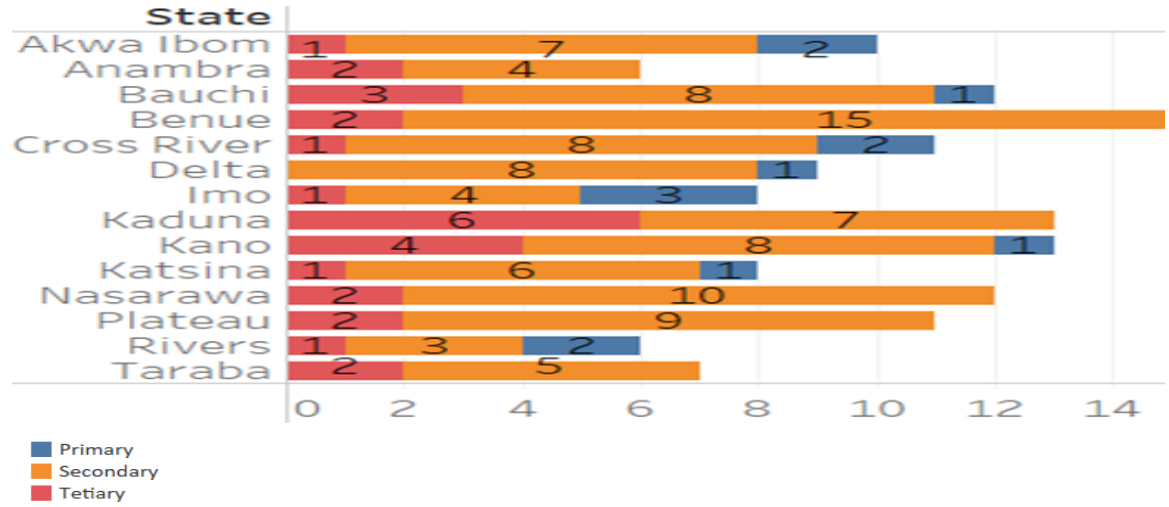

Figure 1. Availability of molecular WHO recommended rapid diagnostic tests in public health facilities where patients visited for care.
Source: Data collected from 14 states used for the study

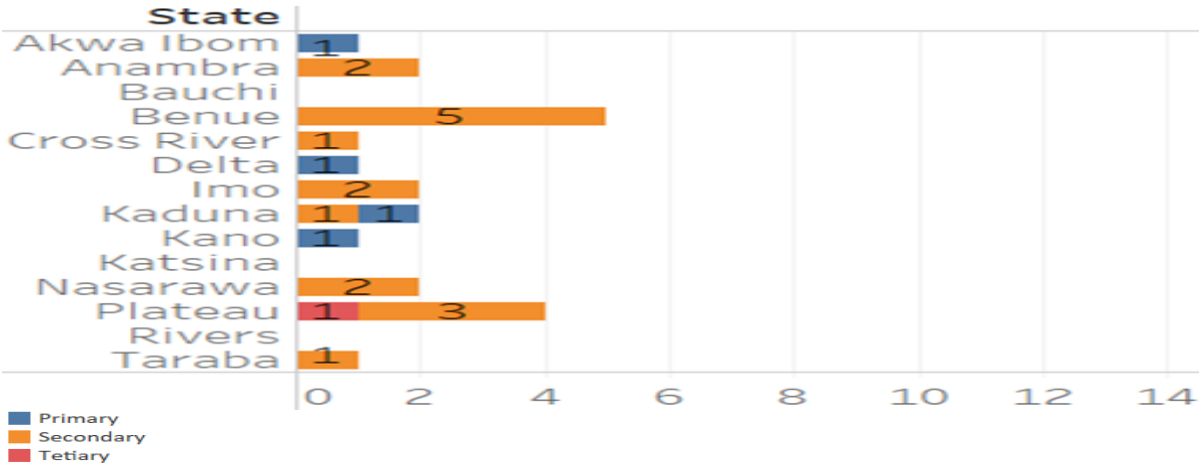

Figure 2. Availability of molecular WHO recommended rapid diagnostic tests in private health facilities where patients visited for care.
Source: Data collected from 14 states used for the study

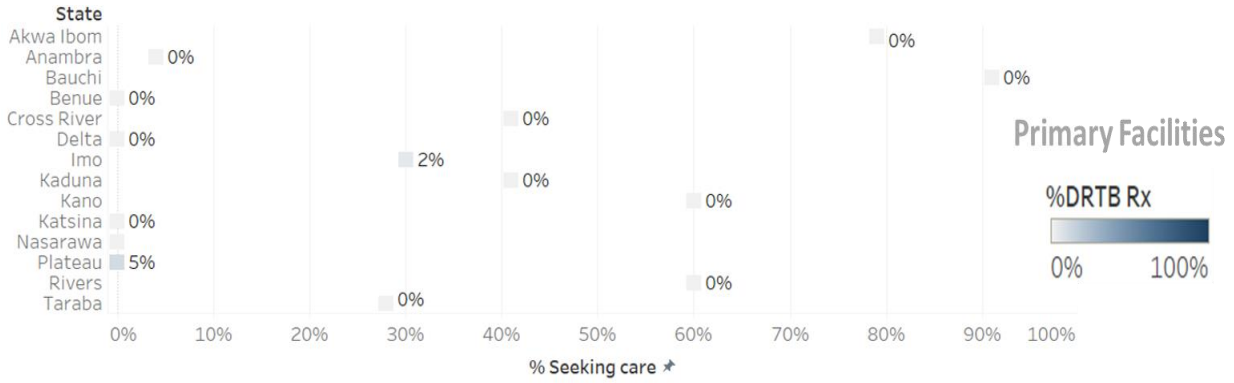

Figure 3. Alignment of DR-TB treatment and where patients first seek care in the primary public facilities.
Source: Data collected from 14 states used for the study

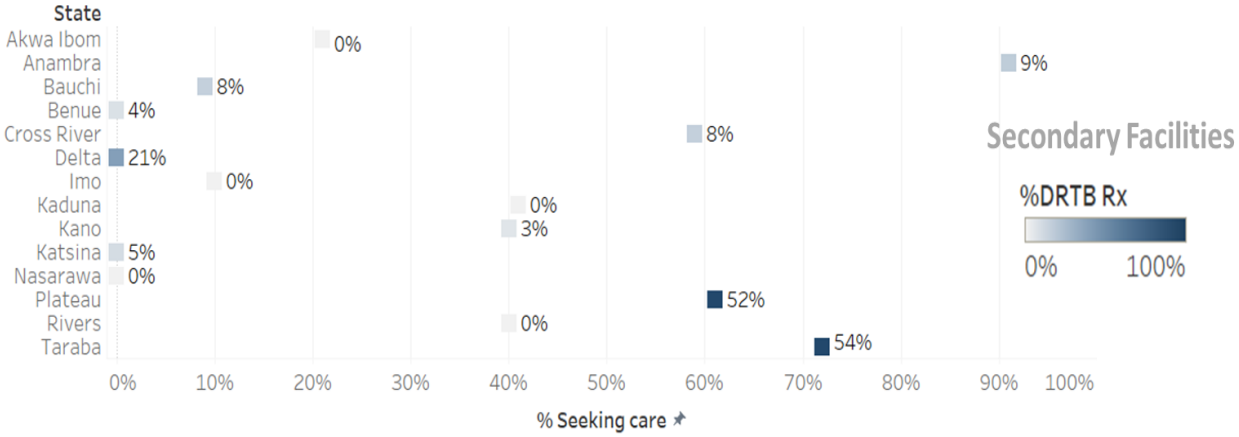

Figure 4. Alignment of DR-TB treatment and where patients first seek care in the secondary public facilities.
Source: Data collected from 14 states used for the study

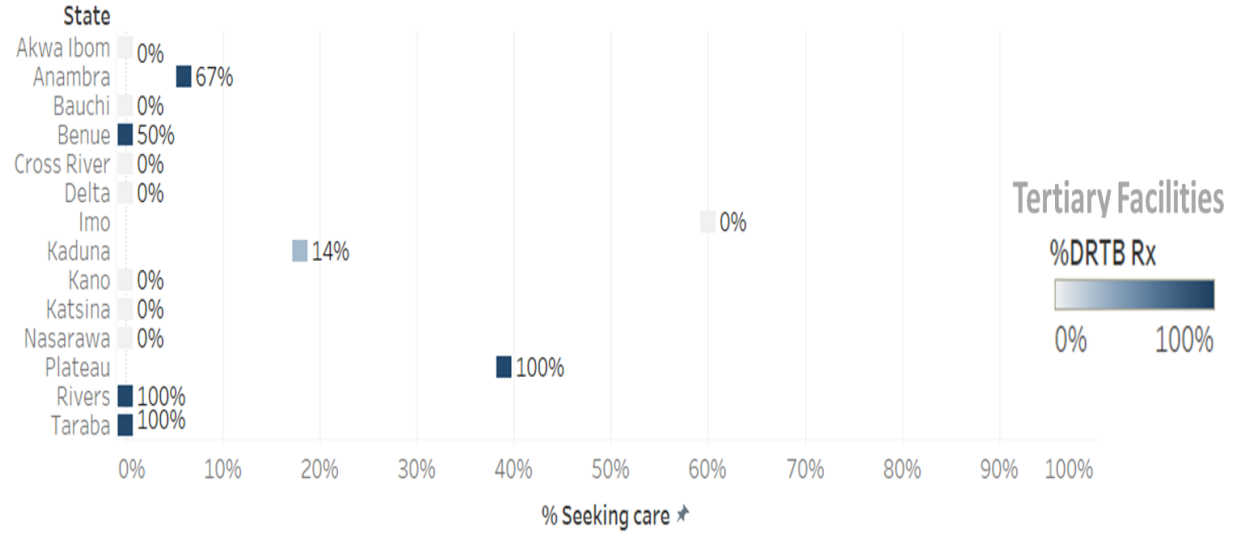

Figure 5. Alignment of DR-TB treatment and where patients first seek care in the tertiary public facilities.
Source: Data collected from 14 states used for the study

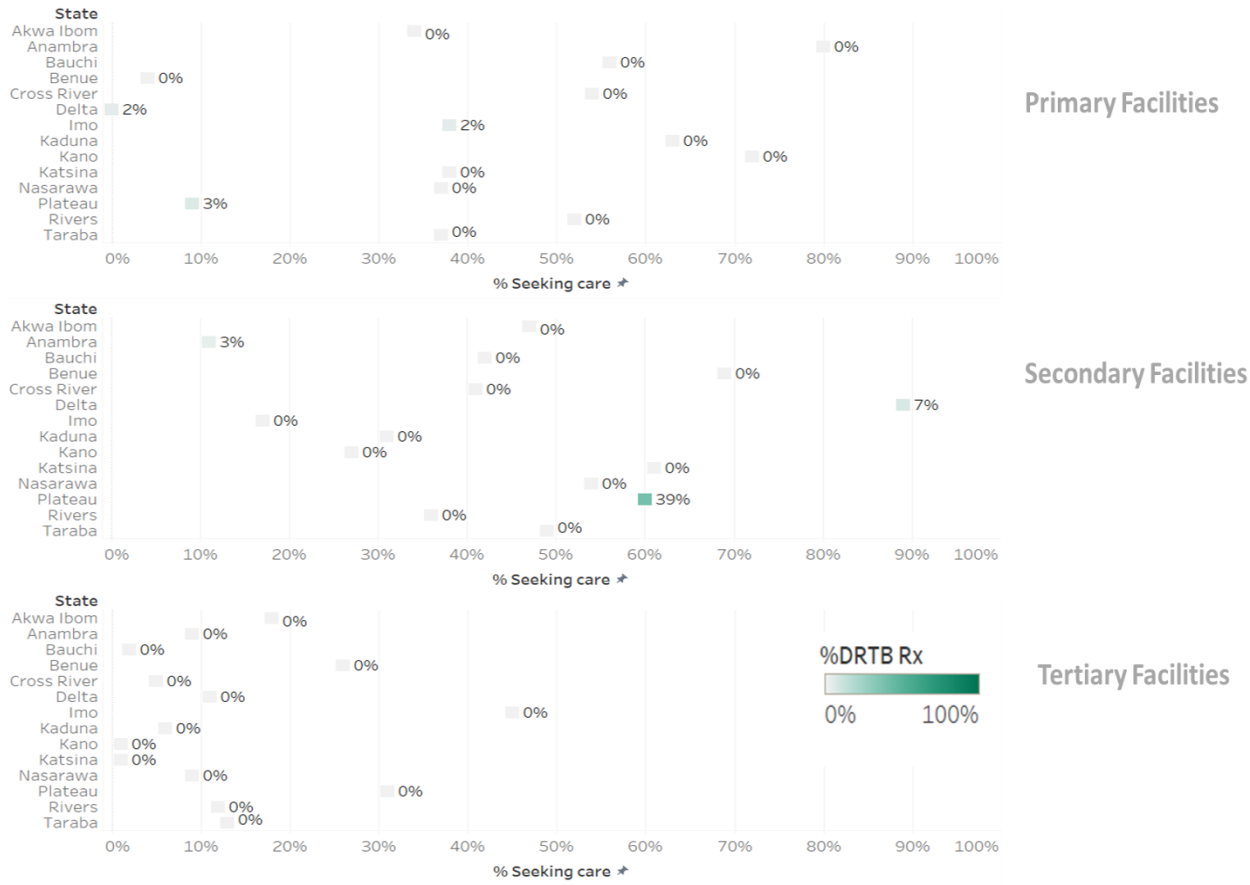

Figure 6. Alignment of DR-TB treatment and where patients first seek care in the private facilities. Source: Data collected from 14 states used for the study

DR-TB treatment service alignment in the private sector

Overall, for the private sector, very few facilities offer DR-TB treatment at the primary and secondary levels of care, and no tertiary facility offers DR-TB care. Only 6 (43%) states have private healthcare facilities with DR-TB treatment availability; these are very low between 2 and 7%, with only Plateau state having up to 39% (Figure 6).

DISCUSSION

The findings from this study indicate that there is an overall misalignment of DR-TB services in both private and public sectors and across all three levels of care. In the public sector, at the primary, secondary and tertiary facilities, there are very limited DR-TB treatment services available across all fourteen states. Ironically, states with the highest availability of services have very limited patients who first sought care at the level, so there is a complete misalignment at all levels. Moreover, in the private sector, it is even worse as largely very few facilities offer DR-TB treatment at the primary secondary levels and tertiary facilities. With this, it is expected that there is misalignment of availability with facilities where patients first sought care.

The poor alignment on DR-TB treatment services and patient care seeking behavior can partly be explained by limited facilities with DR-TB services. Most of the available DR-TB care are limited to the public secondary and tertiary hospitals which are skewed in distribution with more persons not seeking initial care at these levels (FMOH, 2015). In the context of Nigeria's low DRTB case-finding and treatment coverage, this adversely affected access to care, and this may be partly responsible for the low notification and treatment rates of DR-TB reported by the country. It is estimated that in Nigeria, only 11% of the incident DR-TB were diagnosed and 9% placed on treatment in 2018 (WHO, 2019). According to the WHO, Nigeria contributes 12% of the global DR-TB diagnosis gap, and in order to close this gap, there has to be an alignment of the healthcare seeking behavior with DRTB service provision (WHO, 2019a).

These findings are similar to the findings from other

studies. Inadequate coverage of diagnostic and treatment facilities, as well as the poor availability of health products and other operational challenges is well documented in studies from other sub-Saharan African Countries (Mnyambwa et al., 2018; Mohr et al., 2017; Evans et al., 2018; Doualla et al., 2019; Naidoo et al., 2015; Bieh et al., 2017; Van Den Handel et al., 2015; Cox et al., 2015; Iruedo et al., 2017; McLaren et al., 2017; Jacobson et al., 2017; Timire et al., 2019; Jokwiro et al., 2018). The present study agrees with these findings. Another study in Portugal found heterogeneity in the spatial distribution of MDR-TB treatment facilities across municipalities (Oliveira, 2020). Also, another study that involved thematic analysis revealed inequitable access to DR-TB care for some patient socio-demographic groups. While patients were mostly treated equally at the facility level, some patients experienced more difficulty accessing care based on their gender, age, occupation, educational level, and religion (Oga-Omenka, 2020).

Policy experts have proposed that governments particularly evaluate health systems through their impact on the poor, in order to reverse the inequities in delivery (Kruk and Freedman, 2008; Braveman, 2003). This will highlight major difficulties in accessing DR-TB care (WHO, 2019a). The country has identified finding the missing TB cases as the single most important priority for TB control for the upcoming years, as each untreated case can infect 15 to 20 persons per year (NTBLCP/FMOH, 2019). Increasing equitable available services is an important first step for TB control in Nigeria, since case-finding is reliant on patients recognizing their symptoms and presenting to a public health facility with TB services. This is supported by other studies from Nigeria, calling for improved public communication around TB (Hassan et al., 2017; Jombo and Mbaave, 2018).

The major limitation of the study is that it failed to show the misalignment based on geopolitical regions or states of the nation as there are widely varied health indices in the North and Southern regions. This was not done as the research was carried in areas where the project/ programmes are domiciled which is fourteen states out of thirty-six states in Nigeria.

Conclusion

There is a misalignment of availability of DR-TB services with facilities where patients first seek care. This inequitable distribution should be a priority for TB control and needs to be addressed by the National Tuberculosis and Leprosy Control Program in Nigeria. There is need for emphasis on possible interventions to enhance ease and equity of access for of MDR-TB services.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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