

Ease and equity of access to free DR-TB services in Nigeria- a qualitative analysis of policies, structures and processes

Charity Oga-Omenka (✉ omenkac@gmail.com)

Universite de Montreal <https://orcid.org/0000-0003-0779-570X>

Florence Bada

International Research Centre of Excellence, Institute of Human Virology, Nigeria

Aderonke Agbaje

Institute of Human Virology Nigeria

Patrick Dakum

Institute of Human Virology Nigeria

Dick Menzies

McGill University Department of Epidemiology Biostatistics and Occupational Health

Christina Zarowsky

School of Public Health of the University of the Western Cape

Research

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Abstract

Introduction:

Persistent low rates of case notification and treatment coverage reflect that accessing diagnosis and treatment for drug-resistant tuberculosis (DR-TB) in Nigeria remains a challenge, even though it is provided free of charge to patients. Equity in health access requires availability of comparable, appropriate services to all, based on needs, and irrespective of socio-demographic characteristics. Our study analyzed elements that facilitate or hinder equitable access for different groups of patients within the current health system to support DR-TB management in Nigeria.

Methods:

We conducted documentary review of guidelines and workers manuals, as well as 29 qualitative interviews, including 5 focus group discussions, with a total of 86 participants, in Nigeria. Between August and November 2017, we interviewed patients who were on treatment, their treatment supporter, and providers in Ogun and Plateau States, as well as program managers in Benue and Abuja. We adapted and used Levesque's patient-centered access to care framework to analyze DR-TB policy documents and interview data.

Results:

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. Health system factors including positive provider attitudes and financial support provided to the patients facilitated equity and ease of access. However, limited coverage and the absence of patients' access rights protection and considerations in the treatment guidelines and workers manuals likely hampered access.

Conclusion:

In the context of Nigeria's low case-finding and treatment coverage, applying an equity of access framework was necessary to highlight gaps in care. Differing social contexts of patients adversely affected their access to DR-TB care. We identified several strengths in DR-TB care delivery, including the current financial support that should be sustained. Our findings highlight the need for government's commitment and continued interventions.

Introduction

Nigeria has overlapping high burdens of tuberculosis (TB), drug resistant tuberculosis (DR-TB) and HIV, according to the World Health Organisation (WHO) (1). However, in 2018, the country of 198 million people had one of the lowest global case detection rates at 15%. Only about 11% and 9% of estimated DR-TB cases were notified and initiated on treatment, respectively (1). This highlights major difficulties in accessing DR-TB care (1). 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 15–20 persons per year (2).

In terms of health financing, Nigeria spent 3.76% of gross domestic product (GDP) in 2017 (3). With a per capita GDP of USD 5,864, 8%, 32% and 60% of the TB budget was domestic, donor funded and unfunded respectively (1, 3, 4). Seventy-one percent of TB patients faced catastrophic health costs in 2017 (1).

South Africa and Zimbabwe are two examples of countries also classified as high burden for TB, DR-TB and HIV in Africa. In 2017, South Africa spent 8.1% of its \$13,396 GDP (PPP) on health and funded 87% of TB budget internally, with 0% unfunded. The country had 100% and 87% DR-TB notification and treatment rates in 2018. Comparatively, Zimbabwe spent 6.6% of \$2,782 GDP (PPP) on health and domestically funded only 1% of TB budget; with 31% donor funding, leaving 69% unfunded. Despite this, Zimbabwe had 27% and 25% notification and treatment rates (1, 3, 4). These suggest other barriers to TB care in Nigeria, in addition to health financing.

Equitable health systems ensure services are available to everyone in need (5–9). Policy experts have proposed that governments particularly evaluate health systems through their impact on the poor, in order to reverse the inequities in delivery (8, 9). In the TB context, several authors including the WHO, have highlighted the need to target specific sociodemographic groups identified as being at a higher risk of contracting the disease or of having poorer access or outcomes, once infected (7, 10, 11). Another aspect relevant to an equity analysis is the complexity of the TB care pathways- the number of patient visits and pre-treatment processes needed in order to achieve an outcome.

Equity and ease are two ways of looking at access to healthcare. Equity of access focuses on the health system, or supply-side, to ensure equal services for patients in equal need (12). Ease of access explores individual and societal barriers to available healthcare services (12, 13). Effective and equitable access combines these two aspects: the ability to obtain timely health services based on needs, irrespective of sociodemographic characteristics, and without risking financial hardship (13–16). Both are important access indicators to monitor the performance of healthcare systems (15, 17, 18). These definitions are in line with the Levesque et al. characterisation of access as having two main domains (13).

This study aimed to explore patient-centered ease and equity of access to diagnosis and treatment initiation for DR-TB patients through an analysis of policies, structures and processes for DR-TB care in Nigeria.

Methodology

In addition to a document review, we focused on understanding the perspectives and experiences of patients, including those not on treatment, their relatives, care providers and program managers, through an equity of healthcare access framework. Our framework, adapted from the work of several authors (13, 19, 20), helped to identify inequities within the supply and demand sides of access, and highlight areas for improvement.

Conceptual framework

We used a transformative design which involves a theoretical lens to guide interpretation and advocate for action (21, 22). Transformative research advocates for social justice and addresses power imbalances, by focusing on inequalities and marginalization, and this is reflected in every stage of the research (22, 23). The predominant theoretical framework guiding our transformative study is the Levesque patient-centred access to healthcare framework (5, 6, 13). This was also considered through the lens of the TB continuum of care (19, 24), and the WHO's health system building blocks (20). Our adapted framework (Fig. 1) was used to frame our qualitative instruments and to interpret findings.

At its core, the Levesque framework conceptualizes accessibility in five dimensions: approachability, acceptability, availability, affordability, and appropriateness of providers, organizations, institutions and systems. These dimensions must be matched with five corresponding abilities in patients for patients and communities: ability to perceive (or identify needs), seek services, reach resources, pay, and engage, respectively (13).

These healthcare and patient dimensions should be progressive as the patient moves from one stage of the care continuum to the other.

Study population and data collection

We reviewed policy and guideline documents using content analysis, as well as annual reports on DR-TB care in Nigeria between 2015 and 2017, some unpublished (2, 25–30). These included the TB HIV treatment guideline, workers' manuals, annual TB reports and WHO country profiles.

This is part of a larger mixed methods study, with previously published quantitative results (31). We analysed data from 29 out of the 57 interviews conducted as part of the larger study. These included focus group discussions (FGDs) (n = 5) with a total of 62 patients, in-depth interviews with patient relatives (n = 4), healthcare providers (n = 5) and program managers (n = 15) in Ogun, Plateau, and Benue states and in Abuja, Nigeria, between August and November 2017.

Our overall sampling strategy was purposive, selecting participants whose views would most likely be information-rich about delays in DR-TB care, as described above. Within this sampling approach, we selected participants based on availability and consent. We triangulated sampling methods - combining purposive, negative case and convenience sampling.

Healthcare workers' questions included program structure, challenges and strengths, as well as their perception of access barriers and facilitators. Patients and their treatment supporters were also asked to describe barriers and facilitators to accessing DR-TB care that they, their relative or someone they knew had experienced. Female and male only FGDs were additionally probed for any particular challenges facing their gender in accessing care. In addition to the questions for healthcare workers, program managers and implementing partner respondents were asked about the available resources at the national, regional and state level for DR-TB care, their perspectives on the adequacy of these resources, and relevant policy documents on DR-TB care. The documents and guides recommended by respondents were also included in the analysis.

Informed consent from each participant were written or verbal (where needed), before each interview. The first author, who had prior DR-TB implementation experience in Nigeria, carried out the interviews with help from a field assistant. Interviews were conducted in English, and translated into Nigerian pidgin, Yoruba or Hausa, based on the locality or preference of participants. Interviews were audio-recorded, translated where needed and transcribed. Transcripts were sent back to all participants who had earlier agreed to be contacted for accuracy checking, some of whom responded with revised transcripts which we used to replace the original transcripts.

Data analysis

Data analysis began during data collection to enable exploration and comparisons of new themes. Our interview guide was used to deductively develop a coding tree before the process of coding began. Transcripts were checked and read through to give a general understanding of the data. The first phase of coding was inductive to allow new themes to be added to the coding tree. Codes were then matched to the coding tree or assigned new codes. Coding of documents and interview transcripts were around themes based on our conceptual framework of Equity of access to DR-TB care (Fig. 1). The thematic analysis focused on how the system facilitates patient progression after arrival with symptoms at the TB clinic to the point of treatment initiation, as well as on patient pathways to care.

Document analysis helped to triangulate evidence from the in-depth interviews. This also facilitated member checks (participant feedback on emerging themes) to ensure fidelity with participant intents as recommended by Seale (32). Data analysis was facilitated by the use of the Quirkos software, version 1.6.1. Our findings are reported according to the consolidated criteria for reporting qualitative studies (COREQ) (33)

Ethics

The National Health Research Ethics Committee of Nigeria (NHREC/01/01/2007) and the Research Ethics Committee (CER) of the University of Montreal Hospital (17.060) granted ethical approval for this study. An additional ethical approval was obtained from the Research Ethics Committee (CER) of sciences and health of the University of Montreal (CERSES-19-098-D). All participants gave written or verbal informed consent.

Results

Our findings focus on the outputs needed from the health system and the patient to achieve DR-TB cure, by looking at required supply and demand dimensions and how they align with each step in the care continuum, starting from symptom recognition, through health-seeking to completing treatment (34). The five paired supply and demand dimensions, based on the Levesque framework, are presented below and summarised in the Fig. 2.

Approachability and ability to perceive

Certain attributes of the healthcare system and of patients align when the patient recognizes that observed symptoms require medical attention and that certain health services can be accessed. The health system enables this through patient education, transparency and outreach services information (13). This stage in the care continuum should end with the patient deciding to seek care for their health problem.

The national guidelines stressed the need for patient education and community awareness and outreach activities (25, 26). Routine patient education is to include cause and symptoms of TB, availability and free cost of treatment, where to seek healthcare, and how to prevent spread. These activities are to be implemented through home-based care for HIV and TB patients (25). The guidelines encourage healthcare workers to conduct campaigns and sensitization activities to increase testing requests, actively search for cases within the health centers especially for HIV patients, sensitize providers and engage community-based organizations (26, 27). However, the guidelines are not immediately clear about the frequency or funding provisions for these campaigns. It also does not say how active case-finding in the community should be done, although several implementing partners are tasked with these activities.

Patients, their relatives and providers agreed that there was limited awareness about DR-TB in the communities.

“So many are out who don’t know [their] way out [of the illness] at all. All they do is go to a herbalist that they have cough or [Imam] to give them local things for treatment or concoction which [can] cause some other ailment to [their] system. My advice is that there should be awareness through the radio or television that whoever that coughs should visit [the] hospital [and] that it is free because when charges are involved, many will run. Many [people] listen to radio in [their] cars or homes or television. It will be like ‘my friend, you have been coughing for a week and I heard on radio that it is free in the hospital’. It will create awareness” (Male patients FGD).

This often resulted in prolonged pathways to DR-TB care, because DR-TB care were most often available in the public sector. These delays ran into several months to a couple of years, in many cases. Patients acknowledged that the private sector, including patent medicine vendors (PMVs), community pharmacies and private hospitals, were the first point of contact with healthcare but that private practitioners had

lower index of suspicion for DR-TB. The annual TB reports also showed much lower coverage of free DR-TB services in the private sector, limiting the approachability of public healthcare (2, 30).

“So, I [didn’t] really know what to do [anymore] I was ... given the herbal [preparation], I went to church, I went to mosque, went to everywhere, but all [remained] the same I won’t lie to you, [DR-TB] is very strong and very powerful...because I can tell you so many drugs that I have used, I have used ampicillin for about two to three years; [a lot of it] for about two to three years it will just relieve me and then it will come back, that is, it will come back” (Diagnosed untreated male patient).

Respondents mentioned that being told by a healthcare worker in the community, or by a former TB patient, helped them to realise their symptoms were treatable for free in the hospital. Healthcare workers were frustrated that there was more knowledge about HIV in their communities than of TB.

Government TB control officers and program managers mentioned that outreach activities have increased case finding in the communities they supervise.

“So, somebody who would have stayed at home using traditional medicine, thinking that this is just an ordinary cough ... but with the outreaches, [any] cough of 2 weeks... please come out for testing, and from the outreaches a lot of cases have been identified” (Male program manager).

Acceptability and ability to seek

For a patient to utilize healthcare, the health services need to have a higher perceived benefit than other options available to the patient, as well as not to violate any cultural, religious or social norms the patient has. This stage is also affected by the health systems professional values, culture and norms, as well as the patient’s autonomy (13). This stage ends with the patient choosing a particular source or type of care over other options.

As part of the TB private-public partnership strategy, the TB program worker’s manual included notes to organize regular meetings with relevant stakeholders including PMVs and traditional healers at state levels, with national oversight (27). Monitoring meetings with community-based organizations were also to include religious bodies (27). It was not clear from our data how often and where these activities were happening.

Patients, relatives and providers gave several narratives of patients visiting multiple sources of alternative care in search of a cure like PMVs, traditional healers and prayer houses, and most often before ever going to a health center. Sometimes, this was due to being unaware of DR-TB services, inconvenience of these services, misdiagnosis in a private hospital or family influence on patients’ autonomy. The documents we reviewed did not mention protecting the right to health for minors, marginalized groups or other persons who might not be able to take a health decision on their own.

Other times, it was because the patients had more confidence in alternative healers than in the public sector hospital or wrongly attributed TB to other causes. As one HCW puts it:

“There are some people ... they [say they] know what their problem is. [They] came to [the hospital but] gave fake address and phone number ... I think this quarter ... alone, I have lost 3 [patients] like that. The last conversation we had was that they know their problem was [a spiritual attack] from their village and [they] are going to [the church]. So, ... you cannot account for them” (Male program manager).

Patients reported that they preferred to go to private hospitals because of widespread perception of better provider attitudes. The major acceptability barriers to public hospitals included poor provider attitude, unsanitary conditions, and lack of essential medical supplies and accountability.

“Most of private hospital they don’t know [the right thing to do], and private hospital is where most people go to. [Government should] first ... do something [about] private hospitals because ... people will think [they] are getting [good treatment], whereas it is just [the wrong medication] ... In this country, if something happens, people ... go to private hospitals, and they should. [Government hospitals] don’t treat people well. I can’t give birth in a government hospital, my younger one was dying in a government hospital and they said it is not their business, if you don’t get a particular [item], if you don’t get [say, a facemask], they will not attend to [your] child, before we could get [the facemask], the child had died. Government hospitals treat people like dogs, like animals, like ... whatever happens to you is not their business, they will [still] get paid. In private hospitals, they will be sweeping and cleaning every minute ..., and telling you sorry every time, [and] you ... feel a little bit consoled” (Female patients FGD 1).

Patients were more inclined to use the public sector on the recommendation of someone in their community that they trusted, like their pastor or family member. Interviews with members of the community also highlighted the effect of community awareness campaigns in changing people’s beliefs about health services.

“What we heard about TB before the arrival of [the] TB center is that some wicked people do blow the charm[ed] air ... once it is blown at you, you contact TB but the arrival of TB officer changed our orientation, that it’s not so, that it’s not an attack from people but [an] infection...” (Community FGD).

Availability, accommodation and ability to reach

For patients to be able to reach a health service, it needs to be geographically available, with accessible opening hours and appointment systems. The patient should have access to secure transport to reach these services. At the health facility, the patient needs to come in contact with a knowledgeable provider who suspects and tests for DR-TB. This would also need to align with the patient’s support system. At the end of this cascade stage, the patient should be known to the health system and recorded as “tested”.

Based on the annual TB program reports from 2015 to 2017, coverage in services was scaled up nationally: testing facilities increased from 201 to 386 (testing), in-patient treatment centres from 13 to 29 and community outpatient treatment centres from 5 to 200 (28, 30, 35). Most of the testing facilities were located in the tertiary and secondary public health centres, with only 13% and 6% of testing in the private sector and primary health care level respectively (35). In-patient treatment centres were in 27 out

of 37 states, and all were in tertiary or secondary facilities, with 17% in private hospitals, excluding patients who were initiated on treatment in the communities. Geographic coverage of testing was 48% at the end of 2017 (35).

Respondents mentioned the lack of testing and treatment facilities near them as a barrier. Many patients lived far from the health facility, with transportation difficulties, especially in rural areas.

"Some people do not have the opportunity to come down to this place; if it is in their State they will also be able to go to the clinic close to them to [test], knowing that when they get there they will [be treated] well" (Female patients FGD 1).

Several health system barriers were noted including clinic and laboratory operational delays, data errors and stock-outs of essential health products. Healthcare workers gave instances of patients giving wrong contact information, due to poor confidence in the public healthcare system, which affected patient tracking and resulted in loss to follow-up. The treatment guidelines and workers manuals we looked at did not include any procedure for address verification for patients being tested or initiated on treatment.

Healthcare workers also noted limited staff numbers as a major challenge.

"... because we don't have manpower on ground. ... In a particular facility probably, they are only two [staff] and in some cases there is only one personnel. Now you will be handling this, ... you will be doing this [and that]. So, at the end you may not even have time for some of your patients ... that is the greatest challenge we have" (Female HCW)

Affordability and ability to pay

The direct and indirect costs of accessing care and the patient's socioeconomic situation determine whether a patient gets diagnosed and placed on treatment. These costs and ability to keep paying for them will determine if the patient initiates and continues on treatment.

Patients narrated facing catastrophic treatment costs, mostly in the private sector, before finding the right health center for DR-TB care. Other direct and indirect costs were related to transportation for follow-up appointments and for pre-treatment investigations.

However, with support from partners, the TB program pays transport and social support to patients enrolled on treatment, at approximately USD100 per month (29). Patients repeatedly mentioned that the financial support was the biggest facilitator of access for them and their loved ones.

"If not for [the program], many people would have died, because of [DR-TB]. Because it is too costly to handle personally, we just thank God for the people that brought this program because it is very, very expensive to manage. I'm the happiest woman ... here, because when I remember [what I went through with] my daughter, how [we moved] from [one hospital to another]. [A simple] razor blade, before [any hospital staff] will give you that razor blade, you [will need to] go and pay in to the [hospital] account ... I

thank God for [the program]. They make me to be the happiest woman on this earth because [I would have lost my 15-year-old] child ... but today they put laughter into my own family. ... Thank you." (Treatment supporters FGD).

Appropriateness and ability to engage

The healthcare system also needs to be efficacious, well-coordinated, uninterrupted and support the patient to be empowered and adhere to the treatment regimen to its completion. The patient also needs to be able to tolerate or withstand the effects of treatment and have adequate support from their social network. Only then can the desired treatment outcome be achieved.

There were instances of patients losing hope during the long duration of treatment or having unbearable side effects, including pain from injections, to the point where the possibility of dying was preferable to remaining on treatment.

"[An elderly man], ...when he sees the tray for drugs, ... he will start vomiting, ha! even when they have not given him, as soon as he sees it, he starts vomiting. At last even nurse or doctor, when he sees them he will just start vomiting, and finally he said he wants to go, ... if he even sees the color of the doctors or nurses uniform he will be so afraid...he said it is better for him to go and die... maybe he is dead but we don't know, but if he just sees them even there is no drugs he will start vomiting. .. they gave him paper to sign out of treatment...and he signed out and left because he [couldn't] bear the pain [anymore]" (Female patients FGD 2).

Some patients were lost to care due to poor linkages to community care for patients leaving the hospital.

"A lack of information caused my stopping the treatment, due to... lapses on their sides... because ... after they discharged me I was [told] to go the community- who are the community I don't know,... [that] is their medical term... am not a medical person, How do I get to know all those things? ...that was how I actually stopped... taking my medication" (Mixed patients FGD).

Healthcare workers cited a few instances of patients whose families prevented their treatment completion because of their own beliefs that the private sector will offer a cure.

At the health system level, several barriers were noted, including stock out of essential supplies, and inadequate patient counseling.

Overview of equity and ease of access to free DR-TB services

Our document review found, and providers and the patients affirmed. that the DR-TB program provided financial support for patients on treatment, which patients acknowledged as the main facilitator to access. However, to be placed on treatment, there were significant challenges with coverage of services, prolonged care processes, operational errors and provider attitudes.

“When I got to that general hospital to do test ..., which [was 6 months ago] they said ...am going to do eight tests, am going to do seven there [at the general hospital] then the other one at [another location]. [eventually], I did everything, I have [done] the ... seventh test at general [hospital]... so it is remaining, one, at [the other location], they said that one ... audiometric or (hiss) I have forgotten what the doctor called it... which is the eight one. ...[I just did], the x-ray. Everything -the results- are still at home” (Untreated male patient).

All groups of respondents mentioned that some groups of patients had more difficulty accessing care. These include patients living in rural communities far from TB healthcare centres, children whose parents had low trust or information about public healthcare, patients in the private sector, women due to adverse cultural norms that necessitated asking for their husbands’ permission to access care, workers and students.

These difficulties are reflected in the following quotes:

“A 12 years old [girl] came down with ... resistance and the mother vehemently refuse to take her for treatment all in the name of she has given her some cough syrup. The state team went there ... yet this woman stood her ground that she will not allow the daughter to leave ... The TBLS (TB Local Government Supervisor) ...the woman took one knife at... him ... So, now the small [child] that is bearing the pain. But because she is small, she can’t take decision on her own.” (Male program manager).

Livelihoods and education were threatened or interrupted, even for patients’ relatives, in order to navigate the process of care.

“I was learning before, I should have finished learning this year before this TB stopped my learning. It was remaining 4 months for me to complete” (Female patient relative).

“The reason why I don’t want to start now is that...is work! My work...And my house rent is going to be due in November which is next two months;... the reason why I don’t want to [go for treatment] now, is that if the house rent should be due [how can] I tell my landlord that I am leaving for the hospital?! ...I am going to pay for the house rent” (Untreated male patient).

Overall, there was cohesiveness between data source (document versus interviews) and respondent type. However, there were a couple of differences. For example, while the national guidelines recommended that community awareness be carried out, it was not very clear how these were to be funded or implemented by the healthcare worker. Also, several healthcare workers cited cases of female patients and children being prevented from accessing care because of an authority figure, participants in the female-only FGDs did not mention this, even when probed specifically for this. However, a phone interview with a female adult patient living with her father, was interrupted by the father, who asked that his daughter never be contacted again by the DR-TB program as she was already healed by prayers.

Discussion And Recommendations

We conducted qualitative interviews in 4 Nigerian states, combining this with documentary review of guidelines and policies in place within the DR-TB program, in order to explore barriers to access along the pathway to care. Our findings highlight gaps in equity of access to DR-TB healthcare, in terms of approachability, acceptability, availability, affordability and appropriateness. In line with our transformative research approach (22, 23), this discussion of our findings emphasizes possible interventions to enhance ease and equity of access.

In order to improve case finding and treatment coverage rates, the TB program in Nigeria needs to focus attention at the different contextual and health system factors impeding access. Our study identified several barriers within the current DR-TB health system that impede equitable access along the pathway to care for different groups of patients.

We identified access to information about TB in general, and about the availability of free services in particular, as a major challenge, preventing engagement with the system and leading to prolonged care pathways. A study in Nigeria on health-seeking pathways of TB patients found that the perceived cause of TB influenced their first choice of treatment (36). Patients who believed TB was caused by witchcraft were more likely to use alternative treatments. Many participants in our study observed that patients only go the hospital after exhausting other options in the private sector. Treatment delays were, thus, related more to inadequate community education about TB disease and available services, as well as poor health worker attitudes (36). Several community health awareness interventions across different disease settings have documented effectiveness, and these include 'edutainment' using media (radio, TV and print), school and community outreaches, dedicated community helplines in local languages, (37-43). These messages need to be tailored to context and culturally sensitive to be effective and will go beyond the current strategies employed by the Nigerian TB program, which include patient educational posters on the walls of facilities and periodic active case finding in communities. The current strategies rely on a TB patient presenting voluntarily at a facility before learning about available services, or through targeted active case finding activities by implementing partners.

Another opportunity for improving equity of access is improving the referral system between the private and public sectors. Nigeria has one of the highest percentage of patients using the private sector as first point of care (66-92%) in the world, with the over 60,000 PMVs in the country (44). Currently, the TB program has mechanisms in place to meet with representatives from community-based organizations, including traditional and religious organizations, and there are implementing partners working on improving private sector engagement (44). However, these efforts have not translated to significant improvements in referral between the private and public sector (44). Current fees-for-referrals from private facilities will need sustained funding, and additional research is needed to find out more about these programs, including coverage and whether information about the scheme is available to all PMVs and private hospitals. As suggested by the respondents themselves, we agree that media engagement is an

opportunity to increase public awareness using culturally adapted media programs in different languages to take the information directly into communities where it is most needed.

An immediate step for the National program could include additional address verification for all patients being tested for TB. The TB and DR-TB guidelines currently do not include instructions to public providers on address verification steps, unlike in the South African and Zimbabwean guidelines (45, 46). Verifying contact information, especially in settings with informal address systems, has potential in reducing loss to follow-up and improving contact tracing (47-49). One possibility might for the TB program to ask patients to provide contact verifiable addresses for their treatment supporters on testing to serve as an additional way to contact patients if they become lost to follow-up; this 'guarantors' or 'referees' system has been used successfully by financial institutions in Nigeria and similar settings to recover bad loans (50-53). However, operational issues will need to be monitored and addressed to ensure that the benefits outweigh the costs of this additional task in an already overburdened system.

Compared to guidelines from South Africa and Zimbabwe (45, 46), the guideline from Nigeria would benefit from the inclusion of clearly delineated timelines such as replacing "early diagnosis" with "diagnosis of DR-TB within 48 hours of submitting a sample" and "timely treatment initiation" with "commencement of TB treatment within five days of reporting to a health facility with symptoms of TB". The Nigerian guideline could also benefit from the inclusion of relevant sections from the Nigerian Health Act that give weight to patient's rights or highlight penalties for endangering the health of others by refusing care or preventing them from accessing care. This would protect the rights of women and children identified in our study as having limited autonomy to access care.

As a limitation, we were not able to corroborate that all the documents reviewed were sufficiently available to field staff, and how much these documents influenced their practice, and it might be necessary to evaluate this effect in future research. The major documents with which most of the healthcare workers were familiar were the TB guidelines and workers' manuals. Secondly, the purposive sampling method we used may have introduced selection bias.

Conclusions

Our findings highlight health system barriers around coverage, operations errors, and provider attitudes, with patient financial support as a major facilitator; and patient barriers of awareness, perceptions of poor public sector care, beliefs and preference for alternative care. We discussed several opportunities for improvement to the demand and supply factors impacting access to DR-TB healthcare. Given the urgent need to increase notification and treatment coverage, there is a need for the TB program to innovate and reduce these barriers as well as adapting to the needs of the patients, including improving referral system with the private sector, community awareness, and protecting the rights of patients with limited autonomy.

Declarations

Ethics approval: Stated

Consent for publication: Not applicable

Availability of data and materials: All data supporting our findings are included in this published article.

Competing interests: The authors declare that they have no competing interests

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Authors' contributions: The idea for the study and its design was conceived by CO, DM and CZ. Data coding and document analysis was carried out by CO and FB, with feedback from AA, PD and CZ. CO and FB prepared the initial draft of this paper. All authors reviewed the draft manuscript and provided input to preparation and approval of the final version of this manuscript.

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Figures

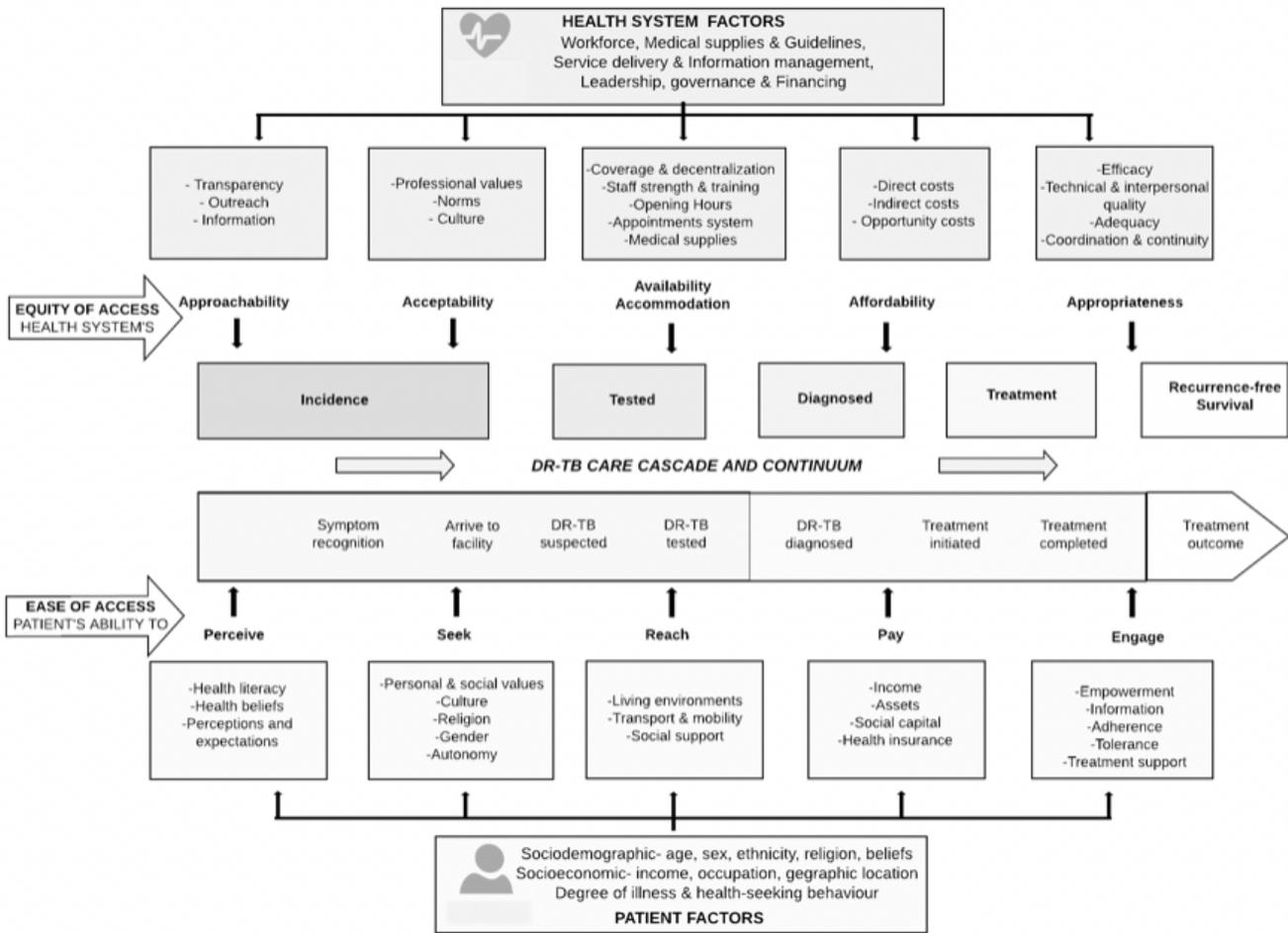


Figure 1

An adapted framework of equity and ease of access to DR-TB care

	Approachability	Acceptability	Availability and accommodation	Affordability	Appropriateness
EQUITY OF ACCESS	<ul style="list-style-type: none"> - Lack of individual and community awareness on the symptoms of TB and availability and location of free care - Inadequate structure and quantity of outreach services - TB services not as approachable as traditional healers, patent medicine vendors or pharmacies - Low index of suspicion in private health facilities 	<ul style="list-style-type: none"> - Poor referral system between private and public health facilities - Inadequate engagement and oversight of public-private partnerships especially with faith-based organizations and traditional healers - Patients cited poor perception due to public sector poor provider attitudes, unsanitary conditions, lack of essential medical supplies and accountability 	<ul style="list-style-type: none"> - Inadequate coverage of testing (48%); mostly public tertiary and secondary facilities - Inadequate coverage of treatment (27 out of 37 states); mostly public tertiary and secondary facilities - Operational delays - Inadequate staff numbers and quality - Data errors affecting patient tracking and follow-up 	<ul style="list-style-type: none"> - High pre-treatment costs for laboratory investigations - Lengthy pre-treatment procedures contribute to costs - Program patient financial support a major treatment enabler 	<ul style="list-style-type: none"> - Poor referral system between private and public health facilities - Inadequate engagement and oversight of public-private partnerships especially with faith-based organizations and traditional healers
EASE OF ACCESS	<p>Ability to perceive</p> <ul style="list-style-type: none"> - Respondents recommend TB health education on TV and radio to maximise reach - Respondents recommend that the TB program engages former patients as community advocates 	<p>Ability to seek</p> <ul style="list-style-type: none"> - Negative perception of public health facilities - Belief that a quicker solution can be found with alternative care - Attributing disease to spiritual causes - Patient's lack of autonomy in making health decisions especially for children and women, hampered access 	<p>Ability to reach</p> <ul style="list-style-type: none"> - Poor transport network - Hard-to-reach geographical locations far from higher level public facilities - Impatience with lengthy pre-treatment processes and operational delays - Work, school and family commitments sometimes a barrier to care 	<p>Ability to pay</p> <ul style="list-style-type: none"> - High costs of wrong diagnosis and treatment often in private sector - High costs of pre-treatment investigations - Transport costs for return appointments prohibitive 	<p>Ability to engage</p> <ul style="list-style-type: none"> - Toxicity of second line drugs a barrier to care for many patients - Reported cases of patients forced out of care by family members - Attributing disease to spiritual causes

Figure 2

Ease and equity of access to free DR-TB care in Nigeria