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Determinants of Quality of Tuberculosis Services in Lusaka, Zambia

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Abstract

The Zambian government, through the Vision 2030 policy, has prioritized health and is committed to the attainment of 'equity of access to cost-effective quality health services, as close to the family as possible by providing a continuum of care with particular emphasis on promotional, preventive, curative, and rehabilitation services. This, however, is challenged by the high disease burden of communicable and Non-Communicable Diseases (NCDs) tuberculosis inclusive. This study was conducted to identify and assess determinants of the quality of TB services. The study utilized a cross-sectional design involving a mixed-methods approach consisting of a desk review facility-based survey of patients on TB treatment using quantitative and qualitative data collection techniques. The study covered 352 randomly selected TB patients, 58 conveniently selected TB treatment support persons, 9 purposively selected TB community volunteers, and 6 purposively selected facility-based service providers. The determinants of good quality of TB care include technical performance, access to services, the effectiveness of care, interpersonal relations, the efficiency of service delivery, continuity of service, safety, physical infrastructure, comforts, and choice of service. Results confirm that good health is a function of the quality of healthcare and utilization of healthcare services and service utilization is affected by social demographics of patients such as age, sex, marital status, type of TB treatment support person, inter alia. Patient's demographic factors determined how the patient view the quality of TB serviced they received.

Keywords: *Determinants of quality of TB care, Tuberculosis, Quality of TB care.*

Introduction

Zambia is one of the 30 countries with high Tuberculosis (TB) burden, with TB being among the 10 causes of morbidity and mortality and accounting for over 30 percent of deaths among People Living with Human Immunodeficiency Virus (PLHIV). The Human Immunodeficiency Virus (HIV) is the main driver of the TB epidemic; TB accounts for about 18,000 deaths annually in Zambia, and about 72 percent of these TB deaths occur among PLHIV [1]. Other factors that predispose people to developing TB include under nutrition, smoking, alcohol abuse and diabetes [2]. Zambia's TB treatment success was about 90 percent in 2018 (excluding missed cases and those lost to follow up before starting treatment). Treatment success rates are lower among HIV positive TB patients (88%).

TB incidence was estimated at about 0.35percent in 2018, representing a 54 percent decline from 0.76 percent in 2000. The decline however doesn't seem to be fast enough to meet the Sustainable Development Goal (SDG) target of ending the TB epidemic by 2030 [1].

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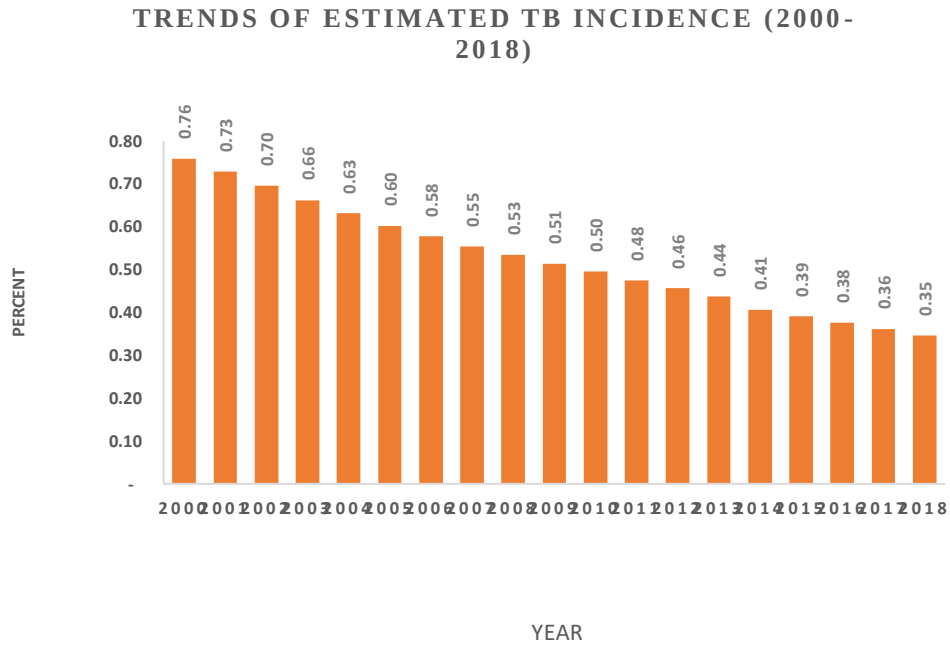

Figure 1. Estimated Trend of TB Incidence-(Source; NAC, 2020)

The observed decline can in large part be attributed to improvement in the quality of TB services which has seen the high increase in Anti-Retroviral Therapy (ART) coverage for patients with TB-HIV co-infection, high TB treatment success rate, and prompt scale-up of TB diagnostics like GeneXpert that are recommended by the World Health Organization (WHO).

TB-related mortality has also significantly declined. About 56 percent decline was recorded between 2000 and 2018, from 233 deaths in 2000 to 102 deaths in 2018, in large part due to improvement in the quality of TB services. The mortality decline was, however only observed among TB patients with HIV. TB mortality among HIV-negative patients remained fairly the same over the same period [3].

Lusaka province has the second-highest TB prevalence (1211/100,000 population in Copperbelt Province Vs 932/100,000 in Lusaka). TB prevalence is higher in urban areas and among HIV-positive people. Men tend to be more affected by TB and the productive age group of 25-44 years is also mostly affected. The low prevalence in age groups 15-24 years and 0-4 years is also attributed to low TB notifications due to missed cases [4]. The recorded improvements in the quality of TB services have, however not helped much in increasing TB case notifications. Treatment coverage remains low at about 58 percent in 2018 because over 40 percent of TB cases were missed due to under detection and not notifying patients of their TB statuses.

The Government of the Republic of Zambia (GRZ) and its partners remain committed to ending the TB epidemic by the year 2030 by increasing access to quality TB interventions for prevention, treatment, and care by strengthening and scaling up prevention, treatment, care, and support of TB services, strengthening detection and management of Multi-drug resistant TB, scaling-up prevention and control services among prisoners and other high-risk groups and strengthening care and support to TB patients [5]. The government's commitment to ending the TB epidemic by the year 2030 has been complimented by Global Fund, which committed US$6 million towards finding missing people with TB [3].

While it is widely agreed that improvement in the quality of TB services is key to ending the TB epidemic, not much is documented about the

determinants of the quality of TB services. This paper hence focused on identifying and assessing the determinants of quality of TB care from the perspectives of TB patients, service providers, and TB treatment supporters.

The paper is the second in a series drawn from the broader study (Assessment of Consumers' Perspective of Quality of TB services at Matero Level I Hospital). The first paper assessed the quality of TB services in Lusaka from the patient's perspective.

Methods

The study was conducted at Matero Level 1 Hospital situated in Matero Township, which has a population of over 300 000 people.

The study utilized a cross-sectional design involving a mixed methods approach consisting of desk review quantitative and qualitative data collection techniques. A desk review was used to identify the determinants of good quality of TB care while a facility-based survey of TB patients, their treatment support persons, TB community volunteers, and service providers were used to assess the identified determinants of good quality of TB care by asking the facility-based service providers, TB community volunteers and consumers about their perceived status of these determinants at Matero Level 1 Hospital.

The selection of TB service providers and community volunteers followed purposive sampling in order to ensure the inclusion of respondents that had been directly involved in the provision of TB services for at least a year. Sample size determination of 9 TB community volunteers and 6 facility-based TB service providers was based on the expected saturation point. Convenient sampling was applied for the selection of TB treatment support persons because very few TB patients came with TB treatment support persons or sent them for drug pick up. It was expected that saturation would be reached at 58 participants for TB treatment persons hence the sample size of 58 people.

Selection of TB patients was done through simple random sampling; every 5^{th} person on TB treatment was included in the study. And sample size determination of 352 TB patients was based on the confidence level of 95%, confidence interval of 5%, response distribution of 50%, and TB patient population on the treatment of 9,026.

Data collection tools included: a checklist for desktop review; key informant interview guides for interviews with service providers and TB treatment support persons; focus group discussion (FGD) guides for TB community volunteers; and semi-structured questionnaires for interviews with TB patients. Data analysis involved thematic and content analysis (manually) for qualitative data, whereas descriptive analysis and regression analysis was done for quantitative data with the aid of SPSS version 22.

Ethical clearance was obtained from ERES converge a local Institutional Review Board and National Health Research Authority (NHRA). Additional approval was obtained from the Lusaka District Health Office and Matero Level 1 Hospital.

The study was limited in scope and coverage due to limited funding. However, the covered population was diverse and more representative of Lusaka urban.

Results

Social Demographics

The majority of the TB treatment support persons interviewed were females (82.8%), and many of them lived-in high-density areas (81%). Most of the surveyed TB treatment support persons had a family size of 5-8 members. Results also revealed that the majority of the TB treatment support persons were spouses to the TB patients (32.8%).

Table 1. Demographics of TB Treatment Support Person (n=58)

Age Median (Range)		35	(18 – 74)
Gender n (%)	Male	10	(17.2%)
	Female	48	(82.8%)
	Total	58	(100.0%)
Residence n (%)	High Density	47	(81.0%)
	Medium Density	11	(19.0%)
	Total	58	(100.0%)
Household size n (%)	1 – 4	16	(27.6%)
	5 – 8	36	(62.1%)
	> 8	6	(10.3%)
	Total	58	(100.0%)
Relationship with patient n (%)	Spouse	19	(32.8%)
	Parent	9	(15.5%)
	Child	10	(17.2%)
	Other relative	13	(22.4%)
	Sibling	6	(10.3%)
	Friend	1	(1.7%)
	Total	58	(100.0%)

Determinants of quality of TB Services at Matero Level 1 Hospital

The identified determinants of quality of TB services (through a desk review of published materials) include technical performance, access to services, the effectiveness of care, interpersonal relations, the efficiency of service delivery, continuity of service, safety, physical infrastructure and comforts, choice as well as social demographic determinants. These determinants of TB care are adopted from the dimensions of quality of TB care outlined in the Quality Improvement Handbook for TB and MDT-TB programs produced by the University Research Co., LLC with support from the United States Agency for International Development (USAID) [6].

Technical Performance

Technical Performance in this context refers to the extent to which the TB services carried out by service providers at Matero Level 1 Hospital adhere to WHO TB standards. The results showed adherence to the WHO TB standard 7, 13 and 20 and lack of adherence to standard 1 [7].

Almost all surveyed TB patients 348 (98.9%) indicated that they were responding to medication, and they all indicated that they received their prescribed medicines for TB on the day of the interview and that it was not common for them not to be given their prescribed treatment whenever they came for drug refill which was contrary to the reported drug shortages by health workers. Respondents also reported that they were happy that they were given the prescribed TB medicines. This was in line with the WHO Standard No. 7 and 13.

The findings further showed that majority (81.5%) of the TB clients spent less than an hour to complete their overall visit to the Hospital. This could be stated that staff were striving to maintain good practice of patient contact time in line with WHO TB standard 20 which states that health care facilities when caring for patients should develop and implement an appropriate TB infection control plan to minimize possible transmission of TB to other patients and health

care providers by ensuring minimal use of health facilities and by managing patients flow.

Access to Services

TB services at Matero Level 1 Hospital are offered to any TB patient regardless of their geographic, economic, social, linguistic, or organizational barriers. A TB treatment support person had the following to say regarding access to TB services:

"These people are good, they allow us to collect medicines for our patients, and they do not trouble us. And when they give you medicines, they explain on how to give the medicines. Like this morning, they told us that we should give medicines to the patient first, wait for some time, like 30 minutes after the patient has taken medicines then give the patient food. What more can we expect, they try" (TB Treatment Support Person).

The results showed that the TB clinic was easily accessible: about 85 percent of TB patients reported that the TB clinic was easily accessible, and 75 percent of them indicated that the clinic was easily located with the aid of verbal directions and signposts.

The results further showed that TB service provision was all-inclusive regardless of the location, economic or social standing of a person in need of TB services. About 40 percent of TB patients, however missed out on health education because of coming late to the TB clinic.

Findings from TB service providers and TB patients confirmed that TB diagnosis was made by either a Medical Doctor or nurse depending on whether it was X-ray or sputum results. The surveyed health workers further indicated that diagnosing TB disease was easy because reagents and diagnostic equipment were available and functional, as shown in the quote below:

"We have not experienced any stock out for TB medicines or reagents in a long time. Sometime back, we had run out of GENE X-pert cartridges which, as you know, are key for the diagnosis of TB. It was for a short period, though, and not a very big problem because we were conducting a microscopic examination of the sputum while we sourced GENE X-pert cartridges from other clinics" (Health care worker).

Effectiveness of TB care

In this context, results showed that 348 (98.9%) indicated that they were responding to medication showing positive treatment outcomes, which may be related to the effectiveness of TB care being offered. One service provider had the following to say regarding the effectiveness of TB care.

One patient made me feel proud when he said, "Here each time I come I get medicines, I am not told to go and buy, and you can see I am even recovered because I have not missed any dose. It would have been difficult for me if I was going to be buying medicines because with this sickness, I stopped work" (Service Provider).

Interpersonal Relations

The participants reported high levels of trust, respect, confidentiality, courtesy, responsiveness, empathy, effective listening, and communication between TB service providers and TB patients. There was no reported discrimination or stigmatizing within the TB service provision environment.

A TB treatment support person had the following to say regarding interpersonal relationships:

*"Just a greeting is enough, they talk to us nicely" (*TB Treatment Support Person*).*

One TB community volunteer had the following to say on interpersonal relations:

*"Patients like to come to this clinic because they tell us that we keep their information in secrecy and that we do not discuss patients in public places even if we know the patient" (*TB community volunteer).

A service provider also had the following to say on interpersonal relationships:

"I was told by a patient that here at this clinic you don't waste time and you tolerate individual

requests and give medicines, especially the patients going for work" (Service Provider).

Some negative interpersonal relationships were noted as shown in the quotes below:

"It pains to see them chatting amongst themselves when you are waiting, they think we don't have things to do, they should feel pity for us, TB sickness gives "ma" pressures (TB treatment Support person).

"Sometimes they make us stay long because if they know that you were in clinic before, and you were sent for either laboratory or X-ray when you come back, they should help so that you don't have to re-join the queue" But no, sometimes they just look at you" (TB Patient).

The service providers had the following to say in response to perceived negative relationships:

"The first come first serve principle sometimes become a challenge because, on humanitarian principles, you want to assist those that are supposed to report for work while making the others wait longer. But this is not a common practice, but it happens" (Service provider).

A TB community volunteer also indicated that *"Sometimes, however, patients just do not understand our routine work and that sometimes we have changes in our routine which we must implement without patients knowing. Like now we have been told to give them medicines for longer periods, and this requires as to carefully count the medicines so that we give right quantities and correct review dates, but to them, it is seen as time-wasting"* (TB community volunteer).

The Efficiency of Service delivery

There was no report of providers performing unnecessary expensive TB diagnostic tests or treatments. The results indicate that patients were only given prescribed medicines, and relevant investigations were only conducted for appropriate patients at the appropriate time. Only a few respondents, 18 (5.1%) and 12 (3.4%), indicated that they had investigations done for laboratory and X-ray, respectively, on the day of the interview.

Continuity of Services

TB service providers, TB treatment support persons as well as TB community volunteers reported that TB patients often received complete packages of TB treatment and care with no or very minimal interruptions. Continuity of services was assured by ensuring that each patient had a treatment support person who helped the patient with meeting all required clinical and pharmacy appointments and drug adherence. TB treatment supporters either escorted the patient to the clinic or collected medicines on behalf of the patient. Each patient was also attached to a community-based volunteer assigned to their area of residence.

Safety

It was reported that the TB clinic was implementing TB infection control activities to ensure safety for patients as well as staff despite the human resource and financial constraints.

"…*like during this COVID period, for example, we were told to be giving patients more medicines to reduce on contact times and prevent Covid-19 transmission"* (TB Service provider).

Social Demographic Determinants

The social demographic determinants of good TB quality care at Matero Level 1 Hospital were marital status, challenges on clinical visits, and helper for drinking medicines at home. Results for logistics regression showed that patients who were divorced were 2.3 times (CI 1.08, 5.07) more likely to report that Matero level 1 Hospital had a good quality of TB services as opposed to being married, widowed, and single. It can further be observed that patients who had transport challenges to visit the clinic were 0.5 times (CI 0.26, 0.95) more likely to report that Matero level 1 Hospital had poor quality of TB services.

Results further showed that patients who were being helped by parents to take TB medicines were 3.4 times (CI 1.14, 10.36) more likely to report that Matero level 1 Hospital had a good quality of TB services, as shown in Table 5 above.

The backward logistic regression also found marital status, residence, challenges on clinic visits, and home helpers for drinking medicines at home as determinants of good quality care at Matero. Results also showed that respondents who were divorced were 2.4 times more likely (CI 1.10, 5.13) to find the quality of TB services offered at Matero level 1 Hospital to be good.

Results further revealed that respondents that came from high-density residences were 1.83 times more likely (CI 1.01, 2.70) to find the quality of TB services offered at Matero level 1 Hospital to be good. In addition, respondents with transport challenges were 0.51 less likely (CI 0.26, 0.93) to find the quality of TB services offered at Matero level 1 Hospital to be good. At home, those respondents on TB treatment who were helped to take medicines by their parents were 3.40 times more likely (CI 1.12, 10.16) to find the quality of TB services offered at Matero level 1 Hospital to be good.

Discussion

The findings have shown that the determinants of good quality of TB services include technical performance, access to services, the effectiveness of care, interpersonal relations, the efficiency of service delivery, continuity of service, safety, physical infrastructure and comforts, choice as well as social demographic factors.

The importance of technical performance as a determinant of the quality of TB care cannot be overemphasized. Adherence to WHO TB standards is vital in ensuring the promotion of effective collaboration of all TB service providers in the provision of all-inclusive high-quality of TB care [8]. Another study confirms that technical performance positively affects patient outcomes 9].

The findings have shown that there is unrestricted access to TB services and high treatment success rate. However, despite the unrestricted access and high treatment rates of over 90 percent, treatment coverage remains a challenge at (was 58 percent in 2018) because over 40 percent of TB cases are missed due to under detection and not notifying patients of their TB statuses. In addition, there is lack of effectiveness in delivery of TB health education given the low coverage of only about 60 percent of TB clients [3].

Results from a study confirms that there is poor access in primary healthcare facilities in the public sector despite the government removing user fees. Contributing factors to limited access included travel costs, costs for drugs and investigations, distance to facility and availability of health workers. Results from this study further indicated that household per capita consumption expenditure was significantly associated with increased odds of seeking formal care [10]. They also revealed that living in a household in which the head had a higher level of education was associated with increased odds of seeking formal healthcare and that rural residence was associated with reduced odds of seeking formal care. However, they also highlighted that expenditure during clinic visits significantly depended on household economic wellbeing and distance from a health facility, among other factors. They concluded that despite the removal of user fees on primary public healthcare in Zambia, access to healthcare was highly dependent on an individual's socio-economic status, illness type, and region of residence [10].

Findings from a study by Kurk have also shown that positive inter-personal relationships between service providers and TB patients have a high potential for improving health outcomes as they lead to improved access and utilization of TB care services [11].

In addition, efficiency in service delivery has also been reported to have positive health outcomes as patients are more likely to shun

away from formal healthcare when exposed to unnecessary expensive TB diagnostic tests or treatments. Efficiency in service hence ensures continuity of TB services which is key in ensuring sustained positive health outcomes [11].

In addition, good health is said to be a function of the quality of healthcare and utilization of healthcare services [11], and the findings show that service utilization is affected by the social demographics of patients.

In another study, results confirm that social demographic factors like age, sex, and educational status are determinants of quality of care as they affect access to and utilization of healthcare. The study established that educational status, wealth index, age, and sex were significantly associated with health care utilization. Educational status was often identified as a key factor affecting health care utilization as it was assumed to be associated with an increased awareness of illness, symptoms, and availability of services, and it acted as a good proxy of socio-economic position by enhancing the ability to afford the various costs involved. Further the results from found that women utilized health services more often than men in urban areas because women were believed to be more responsive to symptoms than men as women were more interested in health and had more knowledge in such issues [12].

Another study revealed that the quality of healthcare for adolescents/young adults was influenced by their age, developmental characteristics, family influences, social networks, customs, and norms of their communities [13].

Furthermore, results from one study also reported that determinants of patient care included not only the availability of specialists and equipment, drugs, or ward facilities but also physical infrastructure, sanitation facilities as well as staff training and development [14].

Johnson in their study, found that rural environment and sense of community with its associated strong social networks were identified as key determinants of good mental and physical health [15].

Azuh in their study, concluded that indicators of health service availability such as community health workers, physicians, nurses and midwives and hospital beds improve women's access to healthcare facilities in Africa and that health service utilization indicators such as population density worsen the quality of healthcare services available to women while electricity access and private health expenditure enhance women's access to quality healthcare delivery. They also stated that health service decision-making indicators such as female bank account ownership, female labour force participation, attainment of basic education, and female household headship were important in enhancing women's access to healthcare facilities [16].

Conclusion

Delivery of good quality TB care services is vital for ensuring a sustainable increase of healthcare outcomes and subsequent eradication of TB by 2030. The determinants of good quality of TB care include technical performance, access to services, the effectiveness of care, interpersonal relations, the efficiency of service delivery, continuity of service, safety, physical infrastructure and comforts, choice as well as social demographic determinants. Despite the above initial findings, there is a need for more robust research with wider coverage and scope to directly assess the dimensions of good quality of TB services in relation to patient outcomes using meaningful assessment instruments and reliable processes.

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Conflict of Interest

The authors of this manuscript have no conflict of interest.to declare. Co-authors have seen and agree with the contents of the manuscript, and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.

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