PUBLICAÇÃO OFICIAL DO NÚCLEO HOSPITALAR DE EPIDEMIOLOGIA DO HOSPITAL SANTA CRUZ E PROGRAMA
DE PÓS GRADUAÇÃO EM PROMOÇÃO DA SAÚDE - DEPARTAMENTO DE BIOLOGIA E FARMÁCIA DA UNISC

Revista de Epidemiologia e Controle de Infecção

Hospital Santa Cruz

ORIGINAL ARTICLE

Access to tuberculosis diagnosis in a municipality of the Western Amazon: health professionals' perspective

Acesso ao diagnóstico da tuberculose em um município da Amazônia Ocidental: ótica dos profissionais de saúde

Acceso al diagnóstico de tuberculosis en un municipio de la Amazonia occidental: perspectiva de los profesionales de la salud

https://doi.org/10.17058/reci.v13i2.18114

Received: *25/01/2023*
Accepted: *02/02/2023*
Available online: *28/06/2023*

Corresponding Author:
Nathalia Halax Orfão
nathaliahalax@unir.br

Endereço: BR 364, Km 9,5, Porto Velho – RO.

Rebeca Sousa Braga[1];
Melisane Regina Lima Ferreira[2];
Rafaele Oliveira Bonfim[2];
Tatiane Cabral Siqueira[3];
Nathalia Halax Orfão[1];

[1] *Fundação Universidade Federal de Rondônia, Porto Velho, Rondônia, Brazil.*
[2] *Escola de Enfermagem de Ribeirão Preto at the Universidade de São Paulo, Ribeirão Preto, São Paulo, Brazil.*
[3] *Hospital de Amor, Porto Velho, Rondônia, Brazil.*

ABSTRACT

Background and Objective: identifying the factors that weaken access to tuberculosis diagnosis allows assessing the actions and surveillance strategies of Primary Health Care (PHC), in addition to ensuring follow-up and monitoring of cases. This study aimed to analyze the dimension of access to diagnosis in PHC from health professionals' perspective in a municipality in the Western Amazon. **Methods:** this is a descriptive survey-type study, carried out in a cross-sectional way and with a quantitative approach in Porto Velho with professionals who work in PHC in the urban area through interviews with the Primary Care Assessment Tool questionnaire, validated for Brazil and adapted for tuberculosis care. Only the access to diagnosis dimension of the version for health professionals was considered, which has twelve variables and presents categories of responses according to the Likert scale. Data were analyzed using descriptive statistics, after complying with ethical precepts. **Results:** a total of 266 professionals were interviewed, and the mean score was classified as regular as well as they almost always have difficulty obtaining information over the phone; sometimes they use motorized transport; have costs with public transport to travel to the health unit; and sometimes they miss a work shift or appointment for the appointment. **Conclusion:** it is essential to reflect on the role with PHC insertion and resolvability as well as adequate clinical conduct, considering the epidemiological data that remain challenging in the municipality.

Keywords: *Tuberculosis. Health Personnel. Diagnosis. Health Services. Primary Health Care.*

RESUMO

Justificativa e Objetivo: identificar os fatores que fragilizam o acesso ao diagnóstico da tuberculose permite avaliar as ações e estratégias de vigilância da Atenção Primária à Saúde (APS), além de garantir acompanhamento

e monitoramento dos casos. Este estudo teve como objetivo analisar a dimensão do acesso ao diagnóstico na APS, sob a ótica dos profissionais de saúde em um município da Amazônia Ocidental. **Métodos:** estudo descritivo, do tipo inquérito, realizado de forma transversal e abordagem quantitativa em Porto Velho, com os profissionais que atuam na APS da zona urbana por meio de entrevistas com o questionário *Primary Care Assessment Tool*, validado para o Brasil e adaptado para a atenção à TB. Considerou-se apenas a dimensão acesso ao diagnóstico da versão para profissionais de saúde, que possui doze variáveis, apresentando como categorias de respostas segundo a escala tipo Likert. Os dados foram analisados a partir da estatística descritiva, após atender aos preceitos éticos. **Resultados:** foram entrevistados 266 profissionais, sendo que o escore médio foi classificado como regular, bem como quase sempre têm dificuldade para obter informação por telefone; às vezes utilizam transporte motorizado, possuem custos com transporte público no deslocamento à unidade de saúde; e às vezes perdem turno de trabalho ou compromisso para a consulta. **Conclusão:** é essencial a reflexão do protagonismo com inserção e resolubilidade da APS, bem como conduta clínica adequada, considerando os dados epidemiológicos que permanecem desafiadores no município.

Descritores: *Tuberculose. Pessoal de Saúde. Diagnóstico. Serviços de Saúde. Atenção Primária à Saúde.*

RESUMEN

Justificación y Objetivos: identificar los factores que debilitan el acceso al diagnóstico de tuberculosis permite evaluar las acciones y estrategias de vigilancia de la Atención Primaria de Salud (APS), además de garantizar el seguimiento y seguimiento de los casos. Este estudio tuvo como objetivo analizar la dimensión del acceso al diagnóstico en la APS, desde la perspectiva de los profesionales de salud en un municipio de la Amazonia occidental. **Métodos:** estudio descriptivo, del tipo encuesta, realizado en abordaje transversal y cuantitativa en Porto Velho con profesionales que actúan en APS en el área urbana a través de entrevistas con el cuestionario *Primary Care Assessment Tool*, validado para Brasil y adaptada para la atención de la TB. Se consideró solamente la dimensión acceso al diagnóstico de la versión para profesionales de la salud que tiene doce variables y se presenta como categorías de respuestas según la escala Likert. Los datos fueron analizados con base en estadística descriptiva, después de cumplir con los preceptos éticos. **Resultados:** se entrevistó a un total de 266 profesionales, y el puntaje promedio fue clasificado como regular, además de tener casi siempre dificultades para obtener información por teléfono; a veces utilizando transporte motorizado y teniendo costos de transporte público al desplazarse a la unidad de salud; a veces perdiendo turno de trabajo o cita para la consulta. **Conclusiones:** es esencial reflejar el papel del papel con la inserción y resolución de la APS, así como la conducta clínica adecuada, considerando los datos epidemiológicos que siguen siendo desafiantes en el municipio.

Palabras clave: *Tuberculosis. Personal de Salud. Diagnóstico. Servicios de Salud. Atención Primaria de Salud.*

INTRODUCTION

Tuberculosis (TB) is a serious public health problem worldwide. In 2019, it is estimated that 10 million people fell ill with TB and 1.4 million died[1]. Among the priority countries with high disease burden and TB/HIV co-infection, Brazil reported 73,864 new cases and 4,532 were deaths, which is equivalent to a mortality rate of 2.2 deaths/100,000 inhab.[1,2]

That same year, Rondônia had 582 new cases and 19 deaths (1.1 deaths/100,000 inhab.), in addition to a low percentage of cures among those with the clinical pulmonary form (70.3%). Of the cases reported in the state, 43.5% (253 cases) were in Porto Velho, with 14 deaths in the respective municipality (2.6 deaths/100 thousand inhab.), and in the country it is the second capital in percentage of abandonment (32.6%).[2]

These data represent the need to prioritize TB control measures, such as case tracking, diagnostic elucidation and care management with the provision and implementation of directly observed treatment (DOT) as well as the insertion and performance of community health workers (CHW), home visits for (ack)knowledge of the social determinants of health involving users, family and community, which can interfere with compliance and disease control actions.[3,4] Furthermore, it is essential to establish and strengthen a bond with greater leading role and resoluteness of Primary Health Care (PHC) as the organizer of the Health Care Network (RAS – *Rede de Atenção à Saúde*) and care coordinator.[5]

Studies indicate that users, most of the time, are diagnosed in reference services,[6] either due to organizational and managerial weaknesses, which include lack of human and material resources, training, support network through the Expanded Center for Family Health and PHC units' opening hours, which hinder the longitudinality of care and comprehensiveness of assistance.[7]

Complementarily, there are other barriers that imply delay in diagnosis, such as the distance from home to the health service, especially in populations residing in rural areas, additional costs with transportation for displacement, lack of knowledge that leads to a misperception of signs and symptoms due to similarity with other comorbidities, in addition to stigma, self-medication, seeking alternative treatment, such as healers or spiritual places, and singularities of some populations, such as indigenous or immigrants in terms of approach due to different languages and cultures.[8]

In addition to this, the lack of integration between information systems and the non-reporting of cases generate a deficit of data, interfering with disease control actions, which intensifies failures in the care provided, delay in diagnosis and initiation of treatment, culminating in the severity of signs and symptoms, high percentages of abandonment and, consequently, continuity in the disease transmission chain.[6,7,9]

Considering the above, identifying the factors that weaken access to a TB diagnosis allows assessing PHC surveillance actions and strategies, in addition to ensuring follow-up and monitoring of cases. Thus, this study aimed to analyze the dimension of access to TB diagnosis in PHC, from health professionals' perspective in Porto Velho-RO.

METHODS

This is a descriptive survey-type study, carried out in a cross-sectional way from a quantitative approach in Porto Velho, capital of Rondônia. Currently, the municipality's PHC consists of 17 Basic Health Units (BHU) and 37 Family Health Units (FHU), totaling 54 PHC units, which are distributed in the urban (20) and rural (33) areas, subdivided into land (18) and riverside (15) units as well as a river mobile unit. In this study, only health establishments distributed in the urban area were considered.

TB care in the municipality is decentralized to PHC, which is responsible for carrying out actions to identify respiratory symptoms (RS), reporting cases in the Reporting Diseases Information System (SINAN - *Sistema de Informação de Agravos de Notificação*), follow-up TB cases undergoing treatment, identifying those who do not, offer DOT, investigate contacts, offer the HIV test, in addition to requesting diagnostic tests (sputum smear microscopy, Rapid Molecular Test for TB (TRM-TB) and chest X-ray) carried out in the municipal laboratory, in addition to sputum culture and sensitivity tests that are carried out in the state laboratory.

As a support network, at an outpatient level, the municipality has two specialized units, one for cases of extrapulmonary TB and childhood TB, and the other for those with TB/HIV co-infection. For cases of drug-resistant TB (DR-TB) and those that require hospitalization, the state has a hospital and an outpatient clinic located in this unit as a reference at the tertiary level.

The study population consisted of professionals working in PHC units in the urban area of Porto Velho-RO. Those who had been in their role for at least 12 months and who had dealt with at least one case of TB since their training were included. All those who were on vacation and/or leave during the data collection period were excluded. It is noteworthy that the delimitation of this study in the urban area occurred, to the extent that in these places there is a greater transmissibility of the disease, number of reported cases of TB and unfavorable outcomes when compared to the rural area. Thus, understanding access to diagnosis from professionals' perspective becomes essential.

To calculate the sample of professionals interviewed, the sample calculation formula with a finite population was used:

$$n = \frac{z_{\frac{\alpha}{2}}^2 * N * P * (1 - P)}{\varepsilon^2 * (N - 1) + z_{\frac{\alpha}{2}}^2 * (1 - P)}$$

In this regard, a 5% error (ε) was considered, a 95% confidence interval (Z), 50% sample proportion (P) of the population (N=737). At least 253 professionals would be interviewed, of which 136 CHWs, 65 nursing technicians/assistants, 26 nurses and 26 physicians.

For data collection, the Primary Care Assessment Tool (PCATool)[10] questionnaire was used as an instrument, validated for Brazil[11] and later adapted for TB care.[12] To meet the objective of this study, only the access to diagnosis dimension of the version for health professionals was considered, which has twelve variables (Chart 1).

The response categories vary according to the Likert scale, with values between one and five, referring to the degree of preference or agreement with the statements (Chart 2).

Chart 1. Dariables related to the access to diagnosis dimension selected for this study.

Dimension	Variables
Access to diagnosis	Waiting time to have an appointment when they have signs/symptoms of TB.
	Number of times users need to go to the health unit to receive care when they have signs/symptoms of TB.
	Number of times users need to go to the health unit to receive care when they have signs/symptoms of TB.
	Time expected by diagnosis when users show signs/symptoms of TB.
	Search for the health unit closest to home for a TB diagnosis appointment.
	Waiting for more than 60 minutes to be seen when users look for the health unit with signs/symptoms of TB.
	Difficulty obtaining information by telephone at the health unit when users have signs/symptoms of TB.
	Difficulty making an appointment by telephone at the health unit when users have signs/symptoms of TB.
	Difficulty traveling to the health unit when users have signs/symptoms of TB.
	Use of motorized transport to travel to the health unit for the TB diagnosis appointment.
	Money spent on public transport to travel to the health unit during appointments for TB diagnosis.
	Loss of work shift or appointment at health services when users have signs/symptoms of TB.

Source: VILLA; RUFFINO-NETTO, 2009.

Chart 2. Professional response categories in the access to diagnosis dimension, from variables C1 to C12, according to the respective scores.

Variables	Response option				
C1	5 days or more	4 days	3 days	2 days	1 day - 24 hours
C2 and C3	5 times or more	4 times	3 times	2 times	1 vez
C4	5 or more weeks	4 weeks	3 weeks	2 weeks	1 week
C5	Never	Almost never	Sometimes	Almost always	Always
C6 to C12	Always	Almost always	Sometimes	Almost never	Never
Scores	0 to 1	1.1 to 2	2.1 to 3	3.1 to 4	4.1 to 5

Source: adapted from Villa & Ruffino-Netto (2009).

Data were collected between May 2018 and February 2019, then stored in Microsoft Excel. They were analyzed using descriptive statistics in the Statistica 13.4 software, from TIBCO. The mean score of the dimension listed for this study was determined, which corresponded to the sum of all the mean scores of the variables divided by the total of variables and, finally, a score for each variable that corresponds to the mean value obtained by the sum of the responses for each question and divided by the total number of participants.[12]

Subsequently, according to the instrument's Likert response scale, the mean scores were classified as unsatisfactory (0 to 1.6), regular (1.7 to 3.3) and satisfactory (3.4 to 5).

The matrix project entitled "*Dimensões organizacionais e de desempenho dos serviços de saúde para o manejo do cuidado aos doentes de tuberculose em Porto Velho-RO*" was approved by the Research Ethics Committee of the *Fundação Universidade Federal de Rondônia*, according to Opinion 2,585,934, meeting the recommendations of Resolution 466/12 of the Brazilian National Health Council.

The interviews took place after signing the Informed Consent Form (ICF) by health professionals at the health unit where they worked and a place that protected their privacy.

RESULTS

A total of 401 professionals were approached, of which 120 were excluded, 65 of which were CHW, 33, nursing technicians/assistants, 13, nurses and 9, physicians, considering that they had not dealt with at least one case of TB since their training (73). They were on vacation during the period of data collection (29), leave (14). They did not exercise their function for at least 12 months (4), in addition to 15 refusals, either due to unavailability of time, interruption of interview during questionnaire application, several attempts to approach without professional acceptance, desire to answer the questionnaire alone and affirmation that such research would not return to the service, totaling 266 health professionals interviewed.

The general mean score of the access to diagnosis dimension was classified as fair (3.3), which, regardless of the professional category, it also concerns that, with regard to users with signs and symptoms of TB, they almost always have difficulty obtaining information over the phone (1.71); sometimes they use motorized transport (3.02) and have public transport costs (2.96) to travel to the health unit; sometimes they miss a work shift or an appointment at the health services when they have signs/symptoms of TB (2.36) (Figure 1).

He presented a satisfactory score on the waiting time of one day to have an appointment (4.59), and they need to go to the health unit once to receive care (4.7) and twice for diagnosis (3.72), being that this occurs in two weeks (3.95). They always look for the closest unit to their home (4.32), almost never wait more than 60 minutes to be seen (3.54) and almost never have difficulty traveling to the unit (3.47). Moreover, they presented unsatisfactory appointment scheduling by telephone, considering that they almost always have difficulty (1.32) (Figure 1).

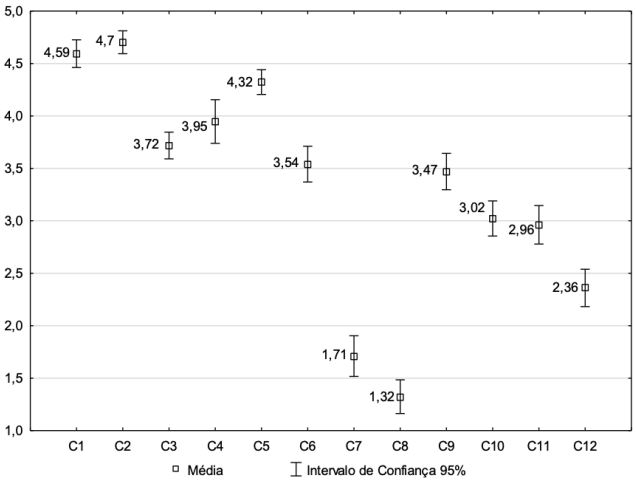

Figure 1. Graphic representation of the mean and confidence interval of health professionals' responses to interviews, according to the dimension access to diagnosis, in Porto Velho-RO, from July 2018 to February 2019.

Caption: C1 - Waiting time to have an appointment when they have signs/symptoms of TB. C2 - Number of times users need to go to the health unit to receive care when they have signs/symptoms of TB. C3 - Number of times users need to go to the health unit to receive care when they have signs/symptoms of TB. C4 - Time expected by diagnosis when users show signs/symptoms of TB. C5 - Search for the health unit closest to home for a TB diagnosis appointment. C6 - Waiting for more than 60 minutes to be seen

when users look for the health unit with signs/symptoms of TB C7 – Difficulty obtaining information by telephone at the health unit when users have signs/symptoms of TB. C8 - Difficulty making an appointment by telephone at the health unit when users have signs/symptoms of TB. C9 - Difficulty traveling to the health unit when users have signs/symptoms of TB. C10 - Use of motorized transport to travel to the health unit for the TB diagnosis appointment. C11 - Money spent on public transport to travel to the health unit during appointments for TB diagnosis. C12 - Loss of work shift or appointment at health services when users have signs/symptoms of TB.

However, when it was observed according to the professional category, there was a regular score from doctors' (3.0) and nurses' (3.23) perspective on waiting times of more than 60 minutes when users have signs and symptoms of TB as well as for the nursing team regarding the difficulty users have to travel to the health unit when they have signs/symptoms of TB. Finally, unsatisfactory score was identified for physicians (1.48) and nursing technicians/assistants (1.64) on the difficulty of TB suspects in obtaining information by telephone at the health unit when they present signs/symptoms of TB (Figure 2).

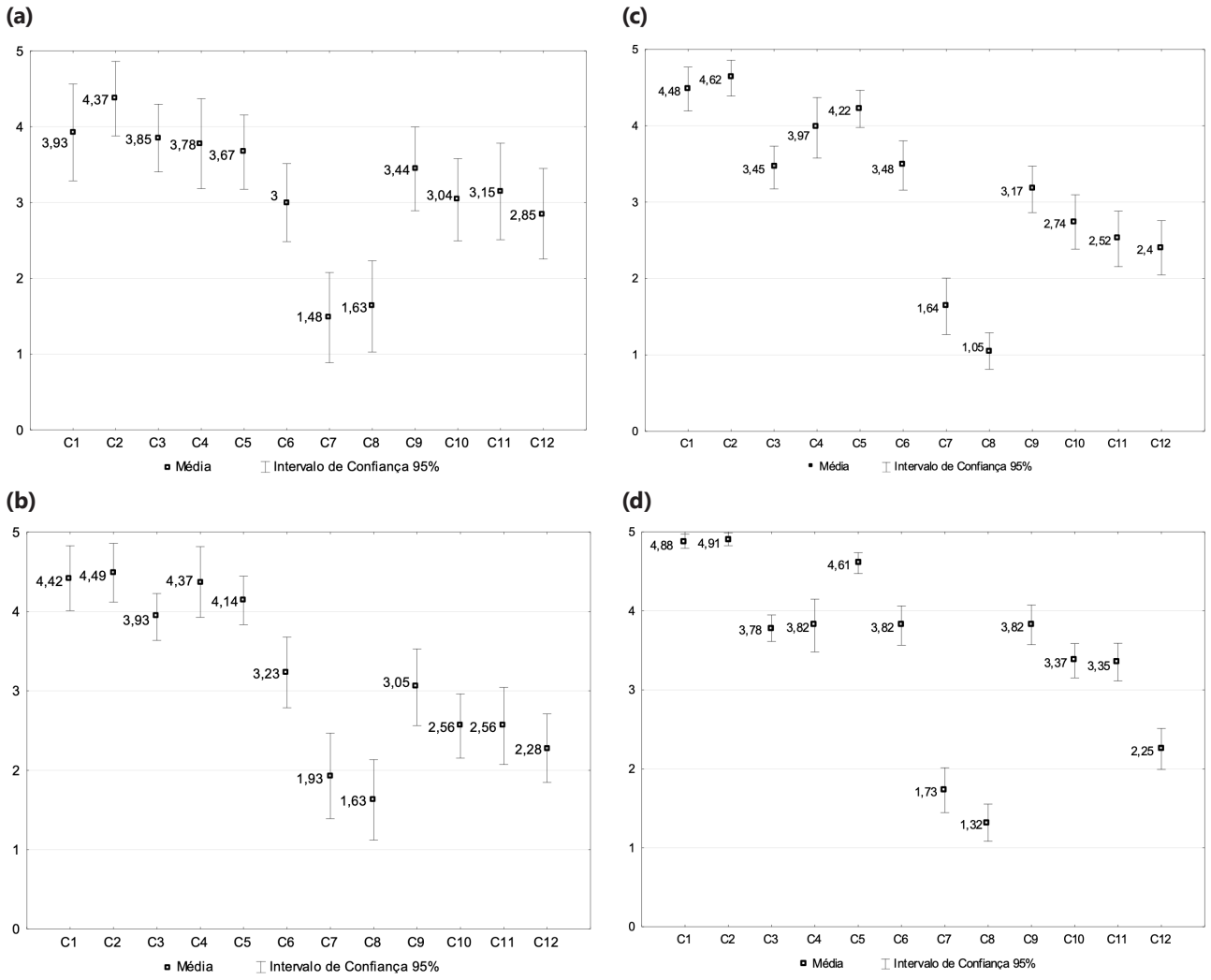

Figure 2. Graphic representation of the mean and confidence interval of the access to diagnosis dimension scores obtained by medical professionals (a), nurses (b), technicians and nursing assistants (c) and CHW (d) in the access to diagnosis dimension (variables C1 to C12), in Porto Velho-RO, from July 2018 to February 2019

Caption: C1 -Waiting time to have an appointment when they have signs/symptoms of TB. C2 - Number of times users need to go to the health unit to receive care when they have signs/symptoms of TB. C3 - Number of times users need to go to the health unit to receive care when they have signs/symptoms of TB. C4 - Number of times users need to go to the health unit to receive care when they have signs/symptoms of TB. C5 - Search for the health unit closest to home for a TB diagnosis appointment. C6 - Waiting for more than 60 minutes to be seen when users look for the health unit with signs/symptoms of TB C7 - Difficulty obtaining information by telephone at the health unit when users have signs/symptoms of TB. C8 - Difficulty making an appointment by telephone at the health unit when users have signs/symptoms of TB. C9 - Difficulty traveling to the health unit when users have signs/symptoms of TB. C10 - Use of motorized transport to travel to the health unit for the TB diagnosis appointment. C11 - Money spent on public transport to travel to the health unit during appointments for TB diagnosis. C12 - Loss of work shift or appointment at health services when users have signs/symptoms of TB.

DISCUSSION

Considering the findings found, it is important to reflect on the high number of professionals who stated that they had not dealt with any case of TB, considering that the municipality has a high incidence coefficient (66.7 cases/100 thousand inhab.) when compared to the country (54.7 cases/100 thousand inhab.) and abandonment,[2] which contributes to transmission chain perpetuation, regardless of whether it is an area covered by the Family Health team. Complementarily, could there have been contact with TB during the consultations, but the

Mycobacterium tuberculosis bacillus was not identified, referring to other levels of care for diagnostic elucidation and reflecting on the delay?

Furthermore, some professionals showed lack of motivation to participate in the research, which may be related to work overload and inability to perceive themselves as essential actors in the context of disease prevention and case control[13] as well as contributing to the identification of challenges and obstacles that still exist, and participating in the formulation of health policies and reorganization of actions and services.

The regular mean score represents challenges in accessing the diagnosis that still persist in PHC's resolvability and leading role, even though this level of care is the main entry point for RS and is responsible for the active search, early detection, diagnosis and treatment of cases of pulmonary TB, in addition to other actions involving health surveillance to control the disease in health territories.

In this regard, is it important to reflect on how PHC has been organized and structured to carry out home visits identifying early those who are characterized as RS for the diagnosis of active TB as well as those who have latent TB infection (LTBI)? How has health professionals' training and awareness about TB been carried out? How has the team been empowered and included all its members in the discussion of TB cases, whether in their health territory and/or in the area covered by the unit, aiming at actions to prevent and control this condition?

With regard to the mean regular score from the variables, not obtaining information by telephone may make it difficult to clarify doubts about the signs and symptoms of either the index case, contacts or people in the community who, at different times, need to use motorized transport or pay for public transport to travel from their homes to the health unit, even looking for the one closest to their residence. Such aspects characterize geographically extensive territories and centralization of units that have more than one team in the same physical structure and, consequently, distance from their territory, which can interfere with access to health services, delay in diagnosis, creation and strengthening of the bond as well as the approximation and effectiveness of actions by teams.

At the same time, the loss of a work shift or appointment to attend the unit, which, in turn, works only during business hours for the most part, had repercussions on fear of unemployment, which, aiming at the social determinants of health, leads to serious vulnerabilities for the onset of diseases, including TB.[8,14-16] At this point, it is also important to reflect on the "*Saúde na Hora*" Program, instituted by Ordinance 930 of May 15, 2019, with the expansion of PHC units' opening hours, although it is not clear about other aspects, such as infrastructure improvements, hiring of human resources and salary increase concomitantly with working hours. It should also be noted that, in Porto Velho, the teams work 30 hours a week, i.e., in the morning or afternoon, which can be characterized as an obstacle and even greater challenge in the search for care and access to health services.

It should also be noted that using the telephone to schedule an appointment, which was assessed as unsatisfactory as well as obtaining information through it, is a tool that requires reflection on its insertion in the work process, especially when we consider the aforementioned aspects of distance between residences and the health unit, costs for displacement, people residing in rural areas with inadequate roads and difficult access.

At the same time, the pandemic period itself, for example, in which there is a reorganization of health services, social distancing and isolation, in addition to other health recommendations, reduced the demand for care by users with symptoms other than those of COVID-19, at the same time that it overloaded the already scarce scenario, with regard to human, material and structural resources, making it if even more worrying.[8,17]

Studies point to a bureaucracy in the appointment scheduling system, disregarding risk stratification, care fragmentation and non-follow-up and monitoring of cases being treated by PHC, in addition to gaps in user guidance and health education actions, which only occur verbally and punctually.[14,18-20]

With regard to the search for the health unit closest to home for a TB diagnosis appointment, studies point out the search outside its coverage area due to the stigma of the disease that implies the fear that other people in the community know about their condition as well as weaknesses in knowledge of users and even professionals in relation to the RAS functioning, with repercussions on the late search and/or for a more distant unit, in addition to other levels of attention even for diagnostic elucidation.[14-21]

Although the variables on waiting time, demand for care and diagnosis were categorized with satisfactory scores, they raise reflections about the occurrence in practice, bearing in mind that early diagnosis is not enough, since the presence of trained professionals, inputs and a support network for carrying out the tests, implementing biosecurity measures and immediacy at the beginning of treatment is essential.[20,22,23]

Differences between the scores correlate with singularities in the work process of the different professional categories with regard to the provision of actions and services to access diagnosis. As a limitation of this study, it is important that the complement of users' point of view be inserted to understand how it is received and perceived by this user.

The results of this study point to difficulties in accessing diagnosis in PHC, which requires its leading role with its insertion and resolvability, aiming at controlling the disease, identifying the profile and vulnerabilities of the cases as well as adequate clinical conduct, considering the epidemiological data that still remain challenging in the municipality. The insertion of strategies that overcome the challenges can be characterized both in service performance and quality and in team motivation and integration when looking at the territory and acting according to the priorities, among them chronic conditions such as TB.

It is noteworthy that data collection took place in the period before the pandemic, whose changes in the health service a reorganization and focus on care make it even more worrying in the execution of strategies from

access to diagnosis to follow-up of cases, in view of the system overload and prioritization of COVID-19 control. Therefore, there is an urgent need to resume and improve TB control strategies and strengthen PHC with regard to adequate structure, improvement in surveillance actions, training and incentives for professionals to provide quality care and improve access.

REFERENCES

1. World Health Organization. Global Tuberculosis Report 2020. Geneva: WHO; 2020.
2. Ministério da Saúde (Brasil). Secretaria de Vigilância em Saúde. Boletim Epidemiológico da Tuberculose. Brasília, n. esp., março. 2021.
3. Ministério da Saúde (Brasil). Secretaria de Vigilância em Saúde. Manual de Recomendações para o Controle da Tuberculose no Brasil. Brasília: Ministério da Saúde, 2019.
4. Freitas PR, Honda ER, Pinto ESG, et al. Intervenção educativa sobre tuberculose para Agentes Comunitários de Saúde em unidades da Atenção Primária à Saúde em um município da Região Norte. Desafios - Revista Interdisciplinar da Universidade Federal do Tocantins 2020, 7(3):145-157. doi: 10.20873/uftv7-8556
5. Mendes EV. A construção social da atenção primária à saúde. Brasília, CONASS, 2015.
6. Silva LT, Felipini MCC, Oliveira TB de, et al. Perfil epidemiológico da tuberculose no serviço de referência do estado de Rondônia. Revista de Epidemiologia e Controle de Infecção 2019; 9(1):48-54. doi: 10.17058/reci.v9i1.12249
7. Villa TCS, Brunello MEF, Andrade RL de P. Capacidade gerencial da atenção primária à saúde para o controle da tuberculose em diferentes regiões do Brasil. Texto & Contexto – Enfermagem 2018, 27(4):e1470017. doi: 10.1590/0104-07072018001470017
8. Marahatta SB, Yadav RK, Giri D, et al. Barriers in the access, diagnosis and treatment completion for tuberculosis patients in central and western Nepal: a qualitative study among patients, community members and health care workers. Plos One 2020; 15(1):1-18. doi: 10.1371/journal.pone.0227293
9. Ferreira MRL, Bonfim RO, Siqueira TC, et al. Abandono do tratamento da tuberculose: uma revisão integrativa: uma revisão integrativa. Revista Enfermagem Contemporânea 2018;7(1):63-71. doi: 10.17267/2317-3378rec.v7i1.1579
10. Starfield B. Atenção Primária, equilíbrio entre necessidades de saúde, serviços-tecnologia. Brasília: UNESCO, Ministério da Saúde, 2002.
11. Almeida C, Macinko J. Validação de uma metodologia de avaliação rápida das características organizacionais e do desempenho dos serviços de Atenção Básica do Sistema Único de Saúde (SUS) em nível local. Brasília, DF: Ministério da Saúde, 2006.
12. Villa TCS, Ruffino-Netto A. Tuberculose: pesquisas operacionais. 1. ed. Ribeirão Preto: FUNPEC Editora, 2009.
13. Zawedde-Muyanja S, Nakanwagi A, Dongo JP, et al. Decentralization of child tuberculosis services increases case finding and uptake of preventive therapy in Uganda. The International Journal of Tuberculosis and Lung Disease 2018; 22(11):1314-1321. doi: 10.5588/ijtld.18.0025
14. Ereso BM, Ymer SA, Grandmann C, et al. Barriers for tuberculosis case finding in Southwest Ethiopia: A qualitative study. Plos One 2020, 15(1): e0226307. doi: 10.1371/journal.pone.0226307
15. Oliveira AH, Pinto AGA, Lopes M do SV, et al. Therapeutic itinerary of people with tuberculosis in face with their health needs. Escola Anna Nery 2019; 23(3):e20190034. doi: 10.1590/2177-9465-EAN-2019-0034
16. Tomberg JO, Spagnolo L de ML, Harter J, et al. Comportamento de busca por serviços de saúde para a detecção da tuberculose. Revista de Enfermagem da UFSM 2020; 10:1-18. doi: 10.5902/2179769241815
17. Baumgarten A, Hilgert JB, Pinto IC, et al. Facility infrastructure of primary health services regarding tuberculosis control: a countrywide cross-sectional study. Primary Health Care Research & Development 2018; 20:e67. doi: 10.1017%2FS1463423618000646
18. Gali JH, Varma HV, Badam AK. Hurdle in the eradication of tuberculosis: delay in diagnosis. The Egyptian Journal of Chest Diseases and Tuberculosis 2018; 68(1):32-38. doi: 10.4103/ejcdt.ejcdt_124_18
19. Shiferaw MB, Zegeye AM. Delay in tuberculosis diagnosis and treatment in Amhara state, Ethiopia. BMC Health Services Research 2019; 19, 232. doi: 10.1186/s12913-019-4056-7
20. Spagnolo LML, Tomberg JO, Martins MD da R, et al. Detecção da tuberculose: a estrutura da atenção primária à saúde. Revista Gaúcha de Enfermagem 2018, 39:e20180157. doi: 10.1590/1983-1447.2018.20180157
21. Vyas A, Creswell J, Codlin AJ, et al. Community-based active case-finding to reach the most vulnerable: tuberculosis in tribal areas of India. The International Journal of Tuberculosis and Lung Disease 2019; 23(6):750-755. doi: 10.5588/ijtld.18.0741
22. Kweza PF, Schalkwyk, Abraão N, et al. Estimating the magnitude of pulmonary tuberculosis patients missed by primary health care clinics in South Africa. The International Journal of Tuberculosis and Lung Disease 2018; 22(3):264-272. doi: 10.5588/ijtld.17.0491
23. Rodríguez-Márquez I, Montes F, Upegui LD. et al. Delays in diagnosing pulmonary tuberculosis within a context of medium incidence, Medellín, Colombia, 2017: a operational research. BMC Public Health 2020; 20(1):757. doi: 10.1186/s12889-020-08829-9

AUTHORS' CONTRIBUTIONS

Rebeca Sousa Braga contributed to the study conception and design, data analysis and interpretation, writing and critical review of the manuscript. **Melisane Regina Lima Ferreira** contributed to data collection and critical review of the manuscript. **Rafaele Oliveira Bonfim** contributed to the critical review of the manuscript. **Tatiane Cabral Siqueira** contributed to the data collection and critical review of the manuscript. **Nathalia Halax Orfão** contributed to the study conception and design, data analysis and interpretation, writing and critical review of the manuscript. All authors approved the final version of the manuscript to be published and are responsible for all aspects of the manuscript, including ensuring its accuracy and integrity.