

Health service access for tuberculosis diagnosis and treatment among indigenous peoples in Rondônia state, Brazilian Amazon, 2009-2011: a cross-sectional study*

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Abstract

Objective: to investigate access to health services for tuberculosis (TB) diagnosis and treatment among indigenous peoples in Rondônia State, Brazil, 2009-2011. **Methods:** we conducted a cross-sectional study with indigenous people attending Indigenous Health Care Units (Casai) between October 2009 and February 2011; geographical, economical and functional dimensions of access to TB services were evaluated through interviews and then described. **Results:** 52 indigenous people with TB were interviewed; in the geographical dimension, lack of transportation, distance and lack of health professionals were the main obstacles; in the economic dimension, 15 indigenous people reported cost/expense as a barrier to access; in the functional dimension, 21 arrived at the Casai using their own means; 24 reported that the time between first symptoms and arriving at the Casai was > 30days; 25 reported that time between first consultation and starting treatment was >30 days; treatment was supervised in 22 cases. **Conclusion:** the difficulties found in accessing health services in the dimensions we analyzed can contribute to TB continuing to be transmitted in indigenous villages.

Keywords: Tuberculosis; Health of Indigenous Peoples; Health Systems; Public Health Surveillance, Health Services Accessibility.

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Introduction

Interest in tuberculosis among indigenous peoples has been increasing since 1990.^{1,2} In Brazil there are reports of active tuberculosis incidence rates three times higher than the national averages,^{2,3} prevalence of latent infection in excess of 40% in the Northern region,^{4,6} considerable concentration of cases in border regions,^{7,8} a drug resistance emergency^{8,9} and patterns of recent transmission in 63.5% of cases in Mato Grosso do Sul state (1999-2001).¹⁰ The level of these indicators is a result of socio-economic disadvantages, discrimination, prejudice and indigenous people having difficulty in accessing health services.¹¹

Little is known about the problems related to access to diagnosis and treatment services and control actions in indigenous areas. According to some authors,¹²⁻¹⁵ access depends on the availability, structure and organization of local systems, as well as overcoming barriers of a geographic, economic and functional nature in order for actions developed by services to meet the needs of the population.

This study aimed to investigate access to health services for tuberculosis (TB) diagnosis and treatment among indigenous peoples in Rondônia state, Brazil, between 2009 and 2011.

Access depends on the availability, structure and organization of local systems, as well as overcoming barriers of a geographic, economic and functional nature in order for actions developed by services to meet the needs of the population.

Methods

We conducted a cross-sectional study collecting primary data and monitoring indigenous people being treated for TB in Indigenous Health Support Shelters (Casai) in Rondônia state. The study did not use probabilistic sampling; we included all indigenous people cared for between October 2009 and February 2011.

Indigenous Health in Brazil is organized into Special Indigenous Health Districts (DSEI) which report to the Health Ministry's Special Indigenous Health Secretariat (Sesai).^{16,17} The structure of the DSEIs is comprised

of: Health Outposts in villages; Base Centers (health and/or administrative centers); and Indigenous Health Support Shelters (Casai) (support for indigenous people during appointments/procedures at other health care levels).^{16,17}

In Rondônia state, the Porto Velho DSEI, which also covers part of Amazonas state, concentrates its actions in five municipalities and is responsible for the health care of 11000 indigenous people. The Vilhena DSEI, which also covers part of Mato Grosso state, concentrates its actions in four municipalities and is responsible for the health care of 7000 indigenous people.¹⁸

We chose Rondônia because of the sizeable occurrence of TB cases in the region between 1997 and 2006,^{5,9,17,19} as well as the perspective of the local DSEIs expressing the capacity of the Indigenous Health subsystem to detect TB cases among the population that lives in indigenous lands both within and outside of Rondônia state.

We used a semi-structured questionnaire adapted from Coimbra Jr. et al.²⁰ and Scatena-Villa & Ruffino-Netto.²¹ In the case of indigenous people who did not speak Portuguese, we were assisted by indigenous health agents (AIS) who translated for us.

The following variables were considered for analysis: DSEI/Casai responsible for health care/support; sex; and age.

We also investigated the following access dimensions:

- a) Geographic dimension
 - difficulties in getting to the Casais (transportation; distance; money; lack of health professionals);
 - average distance (in km) traveled from indigenous villages to the Casais; and
 - time between onset of symptoms and starting treatment;
- b) Economic dimension
 - cost of getting to the Casais (yes; no);
- c) Functional dimension
 - form of access to Casais (self-referred; health service referral);
 - responsible for referral (doctor/nurse; indigenous health agent [AIS]);
 - time between onset of symptoms and reaching the Casais (in days: <15; 16-30; >30);
 - frequency of stays at the Casais (<5; >5);
 - 1st treatment used (medication; plants; prayer/shamanism; combined therapy [traditional medicine and biomedicine]);
 - time between first consultation and starting treatment;

- diagnostic examinations (bacilloscopy; sputum culture; chest x-ray);
- observed treatment (daily; 2-4 times a week; never).

The Casai access dimensions were compared using Pearson's chi-squared test (χ^2). We calculated average distances (in km) between indigenous villages and Casais, based on geographic coordinates. We analyzed the time correlation (in days) between onset of symptoms and starting treatment using Spearman's rank correlation coefficient. We used SPSS v.9.0.

The interviews took place once the study project had been approved by the Research Ethics Committee and by the National Research Ethics Commission (CEP/CONEP): Opinion No. 176/07 and Opinion No. 327/2008.

Results

We interviewed 52 indigenous people, 16 in Porto Velho, 10 in Guajará-Mirim, 3 in Ji-Paraná and 23 in Cacoal. Two of the indigenous people lived in Amazonas state, three in Mato Grosso state and the remainder in Rondônia state. On average three new TB cases per month were detected in the places we studied. The majority of cases occurred those aged over 10 years old, being 47 out of 52 indigenous people (mean age, 40.4; median, 34,5; variation from 1-90 years), and 28 were male. We identified 46 cases of pulmonary TB.

With regard to the geographic dimension, lack of transport and money were the main complaints in Cacoal and Guajará-Mirim. The distance between the indigenous village and the Casai was the main complaint of the indigenous in Porto Velho, and absence of health professionals to provide care was the most relevant barrier for those interviewed in Ji-Paraná (Table 1).

Time between first consultation at the Casais and starting treatment was more than 30 days in 25 cases. We did not find association between average distance traveled to the Casais and length of time before starting treatment. Some of the indigenous people traveled distances of between 24km and 62km and took more than 30 days to start treatment. On the other hand, correlation was found (Spearman's coefficient = 0.654; p-value <0.05) between the distance from the indigenous villages and time taken to start treatment in the case of those who sought care in the state capital, Porto Velho (Table 2).

In the economic dimension, 15 indigenous people reported incurring cost/expense in getting to the Casais.

In the functional dimension, 21 went to the Casais on their own initiative. Of the 31 referred by health services, 16 were referred by AIS. Twenty needed to go to the Casais more than five times (Table 1).

Twenty indigenous people reported exclusive use of medication/chemotherapy; thirteen reported exclusive use of medicinal plants/roots as their first treatment; ten used both traditional medicine and biomedicine; four exclusively used prayer and one exclusively used a shamanic/healing ritual.

Sputum culture was used for diagnosis for just 22 of the indigenous people and was more frequent in Porto Velho. Twenty-two had their treatment observed daily (Table 1).

Discussion

As in other contexts,^{7,19,22} the majority of the indigenous people consulted in this study were men and young adults. Although the majority of cases were from Rondônia, two were from Amazonas and three were from Mato Grosso.

As reported in relation to the Munduruku people in the state of Pará,²³ approximately half the indigenous people went to the Casais on their own initiative, suggesting that Primary Care has been inefficient in detecting symptomatic respiratory cases in indigenous villages.

A quarter of the respondents mentioned having needed to return to the Casais five times, and waiting for more than 30 days to get conclusive diagnosis, similarly to reports from rural areas in India and from interior regions of Brazil.²⁴⁻²⁷

Traditional indigenous medicine appeared among the treatment options, but without excluding biomedicine. Both use of medicinal plants and prayer and/or shamanism, either on their own or in association with use of Western medicine, were considered in treatment. The therapeutic options used for TB treatment appeared to be interconnected without clearly defined limits. Similar findings have been reported among indigenous people in the Alto Rio Negro region,^{6,28} and in the Munduruku²³ and Xavante ethnic groups.

Contrary to the recommendations contained in national and international guidelines regarding directly observed medication taking,²⁹ less than half of the indigenous people had their treatment observed. Incomplete or inexistent treatment observation, as found here, reduces the chances of cure and increases the possibilities of unfavorable outcomes.^{17,22}

Table 1 – Geographic, economic and functional dimensions of access to Indigenous Health Support Shelters (Casai) in Rondônia, Brazilian Amazon, 2009-2011

Casai Access dimensions	Cacoal n	Guajará-Mirim n	Porto Velho n	Ji-Paraná n	Rondônia n	p-value ^a
Geographic dimension						
Barriers^b						
Transportation	18	4	4	–	26	0.002
Distance	7	3	6	1	17	0.610
Money	15	3	1	–	19	0.001
Absence of health professionals	7	1	4	2	14	0.257
Economic dimension						
Cost						
Yes	12	1	2	–	15	0.011
No	11	9	14	3	37	
Functional dimensional						
How they went to the Casai						
Own initiative	16	2	2	1	21	0.002
Referral	7	8	14	2	31	
Referral						
Doctor/nurse	3	3	9	–	15	0.289
Indigenous health agent (AIS)	4	5	5	2	16	
Time between first symptoms and arrival at the Casai						
Up to 15 days	7	5	8	2	22	0.155
16-30 days	6	–	–	–	6	
More than 30 days	10	5	8	1	24	
Frequency of stays at the Casai						
Up to 5	15	4	11	2	32	0.480
More than 5	8	6	5	1	20	
1st treatment used by patient						
Medication/chemotherapy	11	–	7	2	20	0.137
Medicinal plants/roots	7	3	3	–	13	
Prayer/shamanism	2	–	2	–	4	
Combined therapy (traditional medicine and biomedicine)	2	4	3	1	10	
No information	1	3	1	–	5	
Diagnostic examinations						
Bacilloscopy	18	7	13	3	41	0.721
Sputum culture	7	5	9	1	22	0.400
Chest x-ray	21	9	13	2	45	0.582
Observed treatment						
Daily	6	4	10	2	22	0.002
2-4 times per week	3	–	3	1	7	
Never	14	2	2	–	18	
No information	–	4	1	–	5	

a) Pearson's chi-squared test.

b) The respondents freely reported the barriers they faced. Total replies may be greater than the number of respondents (n=52).

A considerable part of the cases began treatment more than 30 days after diagnosis. In Porto Velho, we found direct and positive association between distance traveled and time taken to start treatment, possibly as a result of referrals to services in the capital which are not available in other cities, revealing low Primary Care ability to effectively deal with cases in the municipalities, besides the fact of Porto Velho being located in a strategic position between the states of Acre, Amazonas and Mato Grosso.

Multidisciplinary health teams in indigenous villages should identify symptomatic respiratory cases, diagnose and treat TB, as well as monitor contacts. However, in view of the precarious diagnosis infrastructure, lack of trained staff and geographic isolation, these actions end up taking place in the urban areas of municipalities.⁶

In India, delay in starting treatment was found to be associated with the distance between patients' homes and health services.²⁶ Souza et al.³⁰ considered that a distance of more than 800 meters between a patient's home and a health service already makes access difficult. If this parameter were applied in Rondônia, access by all the indigenous people interviewed to the Casai would be difficult.

With regard to the limitations of this study, part of the questionnaire was adapted from an instrument validated only for patients receiving care in non-indigenous health services. In some cases interviews were conducted with the aid of interpreters whereby it is possible that there may have been incorrect interpretations. With the aim of

minimizing these problems, the interviewers were trained in data collection standardization, including testing the questionnaire prior to the interviews. We emphasize that the interviews were conducted under the supervision of the authors of this study. The small sample size may also limit robust inferences about barriers to service access. This limitation needs to be considered because these barriers can contribute to TB continuing to be transmitted in the communities and, consequently, contribute to the high burden of the disease reported in the region.^{9,17,19}

Notwithstanding, our study did reveal the difficulties faced by 52 indigenous people in obtaining correct diagnosis and treatment.

Despite the scarcity of studies with this approach in Brazil, it is reasonable to assume that similar situations may occur in other places and with other indigenous groups. There is no data available for public consultation about health facilities available in indigenous territories, but our field experience indicates that in the municipalities of Rondônia, laboratory infrastructure is not adequate for correct diagnosis of suspected TB cases among indigenous people. This fact alone reduces the spectrum of the actions undertaken by the Primary Healthcare teams in the territory.

We recommend that the health authorities equip health services, provide training for health teams in correct management of suspected TB cases among indigenous people, and develop strategies culturally adapted to local reality, in order to guarantee effective and equitable access to TB diagnosis and treatment.

Table 2 – Average distance (km) traveled by the indigenous people from their villages to the Indigenous Health Support Shelter (Casai) and time between first consultation and starting treatment, Rondônia, Brazilian Amazon, 2009-2011

Time between first consultation and starting treatment		Cacoal	Guajará-Mirim	Ji-Paraná	Porto Velho	Rondônia
1 day	n χ	–	–	–	1 61.420	1
3-6 days	n χ	5 45.823	2 49.247	–	1 120.579	8
7-14 days	n χ	1 35.241	–	–	1 189.566	2
15-29 days	n χ	6 34.368	1 132.335	–	1 395.509	8
More than 30 days	n χ	11 36.282	6 61.990	3 24.083	7 343.381	27
No information	n χ	–	–	–	6 61.420	6
Total	n	23	9	3	17	52

Authors' Contributions

Malacarne J, Basta PC and Escobar AL conceived and designed the study. Malacarne J, Basta PC and Alves CG took part in training the team of interviewers and also took part in the interviews. Malacarne J, Souza-Santos R and Basta PC took part in data analysis

and interpretation and wrote the first version of the manuscript. Malacarne J, Alves CG, Escobar AL, Souza-Santos R and Basta PC critically reviewed the manuscript. All the authors have approved the final version of the manuscript and are responsible for all aspects of this article, including guaranteeing its accuracy and integrity.

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