Rev Saúde Pública 2009;43(3)

Lúcia Marina Scatena[I]

Tereza Cristina Scatena Villa[I]

Antonio Ruffino Netto[II]

Afrânio Lineu Kritski[III]

Tânia Maria Ribeiro Monteiro de Figueiredo[IV]

Silvia Helena Figueiredo Vendramini[V]

Marluce Maria de Araújo Assis[VI]

Maria Catarina Salvador da Motta[III]

Difficulties in the accessibility to health services for tuberculosis diagnosis in Brazilian municipalities

ABSTRACT

OBJECTIVE: To assess difficulties in the accessibility to tuberculosis diagnoses in the health services in Brazil.

METHODS: The study was carried out in 2007 and surveyed tuberculosis patients treated in the primary care services in the cities of Ribeirão Preto, São José do Rio Preto, Itaboraí (these three in Southeastern Brazil), Campina Grande and Feira de Santana (these two in Northeastern Brazil). The instrument "Primary Care Assessment Tool" was used, adapted to assess tuberculosis care in Brazil. Tuberculosis diagnosis in the health services was assessed by means of multiple correspondence factor analysis.

RESULTS: The accessibility to the diagnosis was represented by the dimensions "locomotion to the health service" and "assistance service" in the factorial plan. The patients from Ribeirão Preto and Itaboraí were associated with more favorable conditions to the dimension "locomotion to the health service" and the patients from Campina Grande and Feira de Santana were associated with less favorable conditions. Ribeirão Preto presented more favorable conditions to the dimension "assistance service", followed by Itaboraí, Feira de Santana and Campina Grande. São José do Rio Preto presented less favorable conditions to both dimensions, "locomotion to the health service" and "assistance service", compared to the other cities.

CONCLUSIONS: The factor analysis enabled the visualization of the organizational characteristics of the services that provide tuberculosis care. The decentralization of the actions to the family health program and reference centers seems not to present a satisfactory performance regarding accessibility to the tuberculosis diagnosis, as the form of services organization was not a determinant factor to guarantee the accessibility to the early diagnosis of the illness.

DESCRIPTORS: Tuberculosis, diagnosis. Health Services Accessibility. Delivery of Health Care, organization & administration. Equity in Access. Family Health Program. Health Services Evaluation.

INTRODUCTION

Tuberculosis (TB) was present as a public health problem in Brazil during the entire 20th century, being known as a "neglected calamity"[17] that has not been solved yet in the 21st century.[5]

The strategy of the Directly Observed Treatment, Short-course (DOTS), proposed by the World Health Organization (WHO) in 1993[24] and implemented in several regions of the world has increased cure rates in many places.[7] However,

[I] Escola de Enfermagem de Ribeirão Preto (EERP). Universidade de São Paulo (USP). Ribeirão Preto, SP, Brasil

[II] Departamento de Medicina Social. Faculdade de Medicina de Ribeirão Preto. USP. Ribeirão Preto, SP, Brasil

[III] Universidade Federal do Rio de Janeiro. Rio de Janeiro, RJ, Brasil

[IV] Departamento de Enfermagem. Universidade Estadual da Paraíba. Campina Grande, PB, Brasil

[V] Departamento de Enfermagem em Saúde Coletiva e Orientação Profissional. Faculdade de Medicina de São José do Rio Preto. São José do Rio Preto, SP, Brasil

[VI] Departamento de Saúde. Universidade Estadual de Feira de Santana. Feira de Santana, BA, Brasil

Correspondence:
Lúcia Marina Scatena
Av. Bandeirantes, 3900 – Monte Alegre
14040-902 Ribeirão Preto, SP, Brasil
E-mail: tite@eerp.usp.br

Received: 05/20/2008
Revised: 08/08/2008
Approved: 09/7/2008

such strategy has been variably and limitedly successful when it comes to reducing the incidence rates of TB in developing countries, mainly in large metropolises with high health inequality and/or high prevalence of HIV infection. In the Stop TB/WHO Plan for world-wide control of TB for 2006-2015 in developing countries, one of the additional strategies considered as priorities is the increased detection of TB cases in different socio-economic and clinical-epidemiological scenarios by means of the strengthening of the health system both in primary care and in more complex health units, public or private, associated with social mobilization.[25]

TB diagnosis is still delayed and there is the need for greater efficacy in health accessibility.[5,10,19] The fact that the infected individuals do not have access to the health services contributes to the lack of diagnosis in many cases, [15] constituting health inequality.[23]

The deterioration of the public health service has resulted in difficulties in the accessibility to these services, failure in the distribution of anti-tuberculosis drugs and lack of human resources trained to diagnose, notify and follow up the patient with TB.[1] These factors hinder the control of the disease.

A study in the city of Petrópolis (state of Rio de Janeiro) that evaluated the accessibility to primary healthcare services identified that one of the barriers is that the units are open only until 6 p.m.[12] In São Paulo (SP), accessibility was perceived by users, professionals and managers as the worst dimension in the two primary care modalities: *Programas de Saúde da Família* (PSF – Family Health Programs) or *Ambulatórios com Programas de Controle de Tuberculose* (Amb-PCT – Reference Centers with traditional Tuberculosis Control Programs).[6]

A study carried out in the municipality of São José do Rio Preto (SP) reported difficulties in health services accessibility,[22] as the patient must return to the health units several times until he receives the diagnosis and begins the treatment.[8]

The primary care network has been responsible for the actions of *Programa de Controle da Tuberculose* (PCT – Tuberculosis Control Program) since 2001. The actions can be performed in the services, in the PSF and also in traditional reference centers with vertical organization and a specialized team.[13] In 2006, TB was included as a strategic action of the National Primary Care Plan, with indicators to be monitored and assessed.

This work aimed to assess difficulties in health services accessibility for tuberculosis diagnoses in different regions of Brazil.

METHODS

The research study[a] involved five priority municipalities of the Southeast (Ribeirão Preto, São José do Rio Preto and Itaboraí) and Northeast (Campina Grande and Feira de Santana) regions of Brazil. The inclusion criteria were: the DOTS strategy must have been implemented for at least five years and researchers must be integrated into the primary care services.

The surveyed municipalities were characterized according to the organization of TB care, PSF coverage and supervised treatment (ST) in 2007: Ribeirão Preto (SP), low PSF coverage (23%) and high ST coverage (76%); Campina Grande (PB), high PSF coverage (71%) and low ST coverage (16%); Feira de Santana (BA), high PSF coverage (60%) and low ST coverage (2%); São José do Rio Preto (SP), low PSF coverage (12%) and high ST coverage (83%); Itaboraí (RJ), high PSF (70%) and ST (100%) coverage. In all the municipalities, TB care was organized in a reference center with PCT teams and Ribeirão Preto also had PCT teams regionalized in five health districts. In Itaboraí, TB care was part of the PSF (64.7%).

To evaluate the accessibility to the diagnosis, the instrument "Primary Care Assessment Tool" was used, validated by Almeida & Macinko[18] (2006) and adapted to TB care by Villa & Ruffino-Netto (2009).[b] The instrument has questions related to accessibility to the diagnosis in the health services. These questions are specific to each essential organizational component of primary care for the actions of TB control. In addition, there are questions about the patient's profile, clinical-epidemiological information and current health status. The present study used specific questions related to accessibility to the diagnosis and patient's profile. The definition of accessibility in the instrument considered the location of the health unit that is close to the population it services, the days and time in which it is open, the degree of tolerance for unscheduled medical visits and the extent to which the population perceives the convenience of these aspects of accessibility.[20]

The study's universe was constituted by patients undergoing TB treatment in health units that develop actions of the Tuberculosis Control Program (PCT) in the five surveyed municipalities. Patients below 18 years of age and the population of the municipalities' prisons were excluded.

The analyzed variables were: name of municipality, sex, level of schooling and seven items from the questionnaire related to accessibility to the diagnosis. For the variable name of municipality, five categories were

[a] Multicenter project called "Avaliação das dimensões organizacionais e de desempenho dos serviços de saúde de atenção básica no controle da tuberculose em centros urbanos de diferentes regiões do Brasil", carried out by the School of Nursing of Ribeirão Preto – USP.
[b] Villa TCS, Ruffino-Netto A. Questionário para avaliação de desempenho de serviços de atenção básica no controle da tuberculose no Brasil. Jornal Brasileiro de Pneumologia. (forthcoming)

established: "M1" for the municipality of Ribeirão Preto; "M2" Feira de Santana; "M3" Campina Grande; "M4" São José do Rio Preto and "M5" Itaboraí. (Table 1).

The interviewee answered each item according to a five-point Likert scale. The zero value was attributed to the answer "I don't know" or "not applicable"; the values from 1 to 5 register the level of preference (or agreement) in relation to the statements. A database for all the municipalities was created, with ten variables and 514 TB cases.

Multiple correspondence factor analysis was used to evaluate the associations or similarities[13,15] among the categorical variables of the questionnaire and the municipalities. The relationship among the categories of the variables was investigated without the need of a causal structure or the prioritization of probabilities distribution, being appropriate for the study of population data as a non-inferential analytical technique.[4] Initially, an R table was constructed (*n* rows and *s* columns with general term r_{iq}, in which the category of the variable *q* represents the individual *i*) with the questionnaire data, *s* being the number of categorical variables and *n* the number of participants. From this table, a symmetrical table of order was obtained (35 rows x 35 columns, Burt Table), which represents the cross tabulation of all the categories of the participants' responses. Thus, in the cross tabulation of category i of a variable against category j of another variable, we find the absolute frequency of cases k (i x j) in which two categories occur simultaneously.

To obtain plans that represent the configuration of the categories of the variables in space, derived dimensions were calculated, each one maximizing one portion of data variability. The set of these dimensions defines the multidimensional space, and although two or three dimensions are habitual, it is necessary to validate the choice. Thus, the analysis of the decrease in eingenvalues is suggested. The aim is to prioritize the dimensions that precede significant falls in the eingenvalues. The eingenvalues quantify the data variability explained to each dimension and range from zero to one.[4]

To identify a combination of variables that presents more stability in the multidimensional space and explains the largest percentage of variability in the data set, a matrix of eingenvalues was determined. It corresponds to the value of the square of the cosine (Cos^2) of the angle between the variable and the respective dimension. In this matrix, it was possible to determine which variables belong to each dimension taking into account the dimension that presents the highest absolute contribution (Cos^2).[4] Absolute contribution is the summation of the relative contributions of all categories of a variable. The analysis of the absolute contribution, together with the observation of the position in the graph in relation to the axes, help in the interpretation of the derived dimensions and contribute to characterize the axes conceptually. The categories of variables that presented lower eingenvalues have less stability in the multidimensional space and can be excluded from the analysis. However, categories of variables that do not meet this criterion, but which have a relevant theoretical justification to the understanding of the accessibility to the diagnosis, could also be included in the analysis. Finally, it was possible to create a factor space for the set of categories of the variables, to interpret their derived dimensions and their associations.

The variables that represent the questionnaire items were called active variables, as they play the main role in the determination of the results placed in the factorial plan. After the description of the space in the factorial plan was made according to the associations between the active variables, it was possible to include one or more passive variables in order to investigate their relationship to the active ones.[4] The variable name of municipality was considered a passive variable.

The project was approved by the Research Ethics Committee of the School of Nursing of Ribeirão Preto, *Universidade de São Paulo* (EERP/USP).

RESULTS

According to the Burt Table,[a] the highest frequencies of responses of the questionnaire items were observed in the categories of responses with extreme values (1 and 5) and the lowest ones were observed in those with intermediate values. The application of factor analysis to this table generated Figure 1, which shows the decrease in the eingenvalues. The decreases were not very significant, being more evident only in dimensions 1 and 2, with eingeinvalues of 0.295 and 0.286. By means of the matrix of eingenvalues (Table 2), the variables that belonged to each dimension were determined, according to the highest absolute contribution (Cos^2).

Thus, dimension 1 was composed of the variables: (the individual) had difficulty in reaching the health unit; had to use some kind of motor transport; spent money with transport; looked for the health unit that was closest to his/her home. Dimension 2 was composed of the variables: number of times that s/he had to go to the health unit to obtain an appointment and obtaining an appointment within the following 24 hours.

The variables selected for dimensions 1 and 2 were located by means of coordinates in the factorial plan (Figure 2). The variables whose categories presented higher relative contribution to the dimension remained represented in this plan. They are highlighted in bold on Table 2.

[a] To refer to the Burt Table, please visit the online version of this article, Vol.43(3), available from www.scielo.br/rsp.

Table 1. Questionnaire of accessibility to the tuberculosis diagnosis, labels and categories of responses. Municipalities of Ribeirão Preto, São José do Rio Preto, Itaboraí - Southeastern Brazil - Campina Grande, Feira de Santana - Northeastern Brazil, 2007.

Variable label	Questionnaire item	Category of responses
V1	When you started to become ill, how many times did you have to go to the health service to receive assistance?	five or more times 4 times 3 times twice once
V2	When you started to become ill, did you have any difficulty in reaching the health service?	always almost always sometimes almost never never
V3	When you started to become ill, did you have to be absent from work to attend your medical visit?	always almost always sometimes almost never never
V4	When you started to become ill, did you need motor transport to go to the health service?	always almost always sometimes almost never never
V5	When you started to become ill, did you spend money with transport to go to the health service?	always almost always sometimes almost never never
V6	When you started to become ill, could you obtain an appointment in 24 hours to detect the disease?	never almost never sometimes almost always always
V7	When you started to become ill, did you look for the health service that is closest to your home?	never almost never sometimes almost always always

The variables that compose dimension 1 were more associated with the need to reach the health service. Thus, it was called "locomotion to the health service" and explains 7.3% of data variability. On the positive side of dimension 1 are the participants who never had difficulty in reaching the health service, looked for the health service that was closest to their homes, never spent money with transport and never needed motor transport to go to the health service. The participants from the municipalities of Ribeirão Preto and Itaboraí were more associated with the evaluations of these categories of variables that can be characterized as the most favorable conditions. The municipality of Itaboraí was closest to the origin of the factorial plan, which means that the patients from this municipality had evaluations for these variables that were close to mean values. Thus, the participants from Ribeirão Preto presented the best conditions of "locomotion to the health service". The opposite characteristics that presented unfavorable conditions are positioned on the negative side of dimension 1: always had difficulty in reaching the health service, always needed motor transport to go to the health service, always spent money with transport and never looked for the health service that is closest to their homes. The participants from the municipalities of Feira de Santana and Campina Grande were more associated with the conditions expressed in these categories of variables and thus presented the least favorable conditions of "locomotion to the health service". The participants from Campina Grande were located close to the origin of the factorial plan, close to the mean value, and presented more favorable conditions than Feira de Santana (Figure 2).

The variables that compose dimension 2 were more associated with the assistance provided by the health service. It was called "assistance service" and explains 7.2% of data variability. On the positive side of dimension 2 are the participants that needed to go to the health service three times and five times or more, who never obtained an appointment in 24 hours to detect the

Table 2. Correlation measures (Cos^2) for the categories of the variables that represent the questionnaire items and their associated dimensions in the factorial plan. Municipalities of Ribeirão Preto, São José do Rio Preto, Itaboraí - Southeastern Brazil - Campina Grande, Feira de Santana - Northeastern Brazil, 2007.

Variable and Category	Cos^2 1	Cos^2 2	Dimension 1
16: 1	0.069	0.163	2
16: 2	<0.001	0.028	-
16: 3	<0.001	0.125	2
16: 4	0.002	0.007	-
16: 5	0.050	0.333	2
17: 1	0.211	0.031	1
17: 2	0.068	0.066	-
17: 3	0.007	0.021	-
17: 4	<0.001	0.185	2
17: 5	0.325	0.028	1
20: 1	0.027	<0.001	-
20: 2	0.007	0.029	-
20: 3	0.017	0.011	-
20: 4	0.008	<0.001	-
20: 5	0.085	0.026	-
21: 1	0.404	0.239	1
21: 2	0.055	0.095	-
21: 3	0.004	0.191	2
21: 4	0.021	0.013	-
21: 5	0.511	0.042	1
22: 1	0.460	0.174	1
22: 2	0.051	0.052	-
22: 3	<0.001	0.106	-
22: 4	0.008	0.046	-
22: 5	0.549	0.017	1
23: 1	0.031	0.223	2
23: 2	0.007	0.036	-
23: 3	0.005	0.035	-
23: 4	0.026	0.015	-
23: 5	0.057	0.386	2
24: 1	0.067	0.116	2
24: 2	0.041	0.006	-
24: 3	0.007	0.002	-
24: 4	0.013	0.095	-
24: 5	0.175	0.026	1

disease and belonged to the municipality of São José do Rio Preto. In opposition, the participants who are on the negative side of dimension 2 are those who went to the health service once and received assistance, those who always obtained an appointment in 24 hours and thus have more favorable conditions to the dimension "assistance service". According to the location of the municipalities in the factorial plan, the municipality of Ribeirão Preto presented more favorable conditions to the dimension "assistance service", followed by the municipalities of Itaboraí, Feira de Santana and Campina Grande (Figure 2).

The variable "lost one day of work to attend the medical visit" presented low association with the two proposed dimensions; therefore, it was not presented in the factorial plan.

The two dimensions "locomotion to the health service" and "assistance service" composed the factors that were associated with accessibility to TB diagnosis in the factorial plan. The location of the municipalities in the factorial plan in relation to these two dimensions allowed us to observe better conditions of accessibility to the diagnosis for the municipality of Ribeirão Preto, followed by the municipalities of Itaboraí, Feira de Santana, Campina Grande and São José do Rio Preto in less favorable conditions. The condition of best possible accessibility would be that all municipalities were associated with the two dimensions on the positive side of the dimension "locomotion to the health service" and on the negative side of the dimension "assistance service", occupying the Q4 quadrant of the factorial plan, and that the relative contributions of each variable presented higher eingenvalues. The favorable position of the municipality of Ribeirão Preto does not mean that the TB patients from this municipality have optimal conditions of accessibility to the diagnosis due to the low eingenvalues for the selected dimensions; nevertheless, they presented better conditions of accessibility to the diagnosis than the other municipalities.

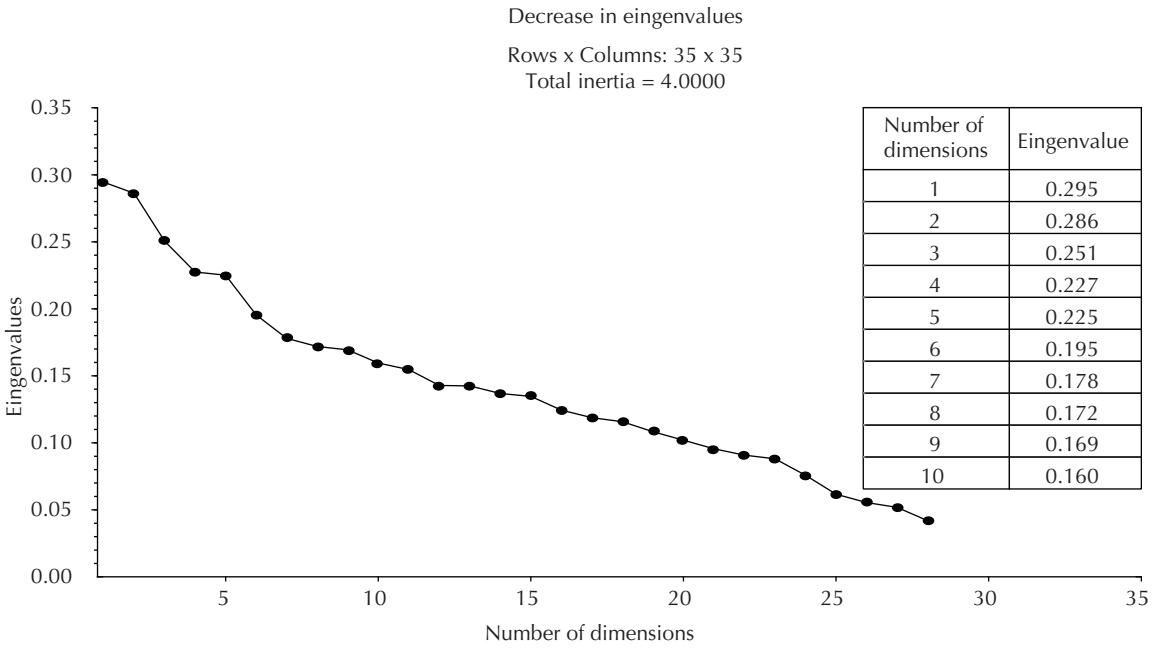
DISCUSSION

In the Burt Table, the highest frequencies of responses observed in categories 1 and 5 did not invalidate the utilization of the Likert scale. This scale is successful because it is able to retrieve Aristotelian concepts of the manifestation of qualities, such as recognizing opposition between contrary elements, gradient and intermediate situation.

In the factorial plan, the reduced numerical expressivity of the eingenvalues does not mean that the analysis lacks quality. Perhaps the individual profiles are relatively close to the mean profile, and the eingenvalues will be, for this reason, weak, but not necessarily less interpretable.[2]

The predominance of men and the low level of schooling corroborate other studies.[11,19]

The results show different classifications of the organizational characteristics of access to the diagnosis of TB patients among the municipalities. In the Northeast region, Feira de Santana and Campina Grande



Number of dimensions	Eingenvalue
1	0.295
2	0.286
3	0.251
4	0.227
5	0.225
6	0.195
7	0.178
8	0.172
9	0.169
10	0.160

Figure 1. Decrease in eingenvalues. Municipalities of Ribeirão Preto, São José do Rio Preto, Itaboraí - Southeastern Brazil - Campina Grande, Feira de Santana - Northeastern Brazil, 2007.

presented less favorable results than the municipalities in the Southeast region, Ribeirão Preto and Itaboraí. However, we expected that the performance of the municipality of São José do Rio Preto (Southeast region) would be similar to that of the municipalities of Ribeirão Preto and Itaboraí due to the geographic similarities in health services utilization. We also expected that its performance would be better than the one presented by Feira de Santana and Campina Grande, located in the Northeast region.

These data show that the form of organization of TB care (PSF or reference center) was not a factor that increased the accessibility to the diagnosis, since the two municipalities of the Northeast region presented high PSF coverage and did not present a satisfactory performance regarding accessibility. In the same way, Ribeirão Preto (Southeast region), whose organization of TB care is in regionalized reference centers, presented a performance that was better than all the others.

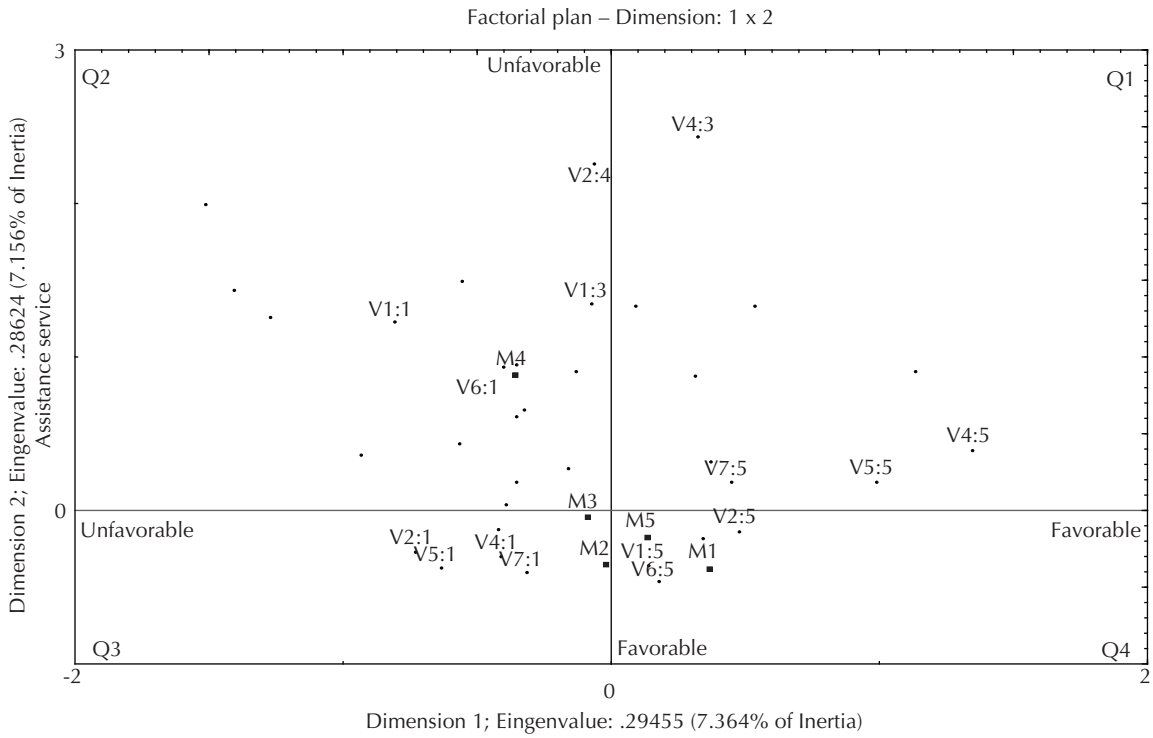
In the Northeast and Southeast regions, the geographic inequalities in health services utilization were evaluated in two moments, before the creation of *Sistema Único de Saúde* (SUS – National Health System) in 1988 and after its implementation (1996/1997). Although a reduction in geographic inequalities in health services utilization has been observed in both regions, the Southeast region presented a better performance than the Northeast region.[21] The unfavorable position of accessibility to the health services in the municipality of São José do Rio Preto was related to the population's cultural habit of looking for emergency services for the first medical intervention, independently of the seriousness of the case. In addition, such position is caused by the hegemonic care model, which focuses on cure and is hospital-centered. Due to this model, patients spontaneously look for the quaternary reference service (university hospital), receiving delayed diagnoses, remaining in precarious clinical conditions, even facing death.[8]

In a study carried out in the state of São Paulo, accessibility to the health services was classified as insufficient. This dimension is inserted into one of the most structuring and complex pillars of primary care in the health systems.[9]

In the state of Rio de Janeiro, late detection, the abandonment of treatment and the ignorance of the cases on the part of epidemiological surveillance were pointed as factors that contribute to the continuous increase in the number of cases of the disease.[19]

In the context of implementation of the decentralization of SUS, the majority of the municipalities has difficulties in organizing a primary care network. Thus, any success in the implementation or improvement in this network of services is a fundamental step to the strengthening of SUS in Brazil.[3]

Instruments and processes that assess the accessibility to the diagnosis of TB patients are necessary in order to create mechanisms that guide the actions of the health services in order to meet the populations' needs and demands. Multiple correspondence factor



Key: Municipalities: M1- Ribeirão Preto; M2 – Feira de Santana; M3 – Campina Grande; M4 – São José do Rio Preto; M5 – Itaboraí.

Categorical variables: V1:1 – (The patient) Needed to go to the health service five times or more; V1:3 – Needed to go to the health service 3 times; V1:5 – Needed to go to the health service once. V2:1 – Always had difficulty in reaching the health service; V2:5 – Never had difficulty in reaching the health service; V4:1 – Always needed motor transport to go to the health service; V4:5 – Never needed motor transport to go to the health service; V6:1 – Never obtained an appointment in 24 hours to detect the disease; V6:5 – Always obtained an appointment in 24 hours to detect the disease; V7:1 – Never looked for the health service that is closest to his/her home; V7:5 – Always looked for the health service that is closest to his/her home.

Figure 2. Factorial plan for the dimensions locomotion and assistance service, which characterize accessibility to the tuberculosis diagnosis. Municipalities of Ribeirão Preto, São José do Rio Preto, Itaboraí - Southeastern Brazil - Campina Grande, Feira de Santana - Northeastern Brazil, 2007.

analysis provided an integrated visualization of the different factors that composed the accessibility to the TB diagnosis in different municipalities, which would be very difficult with the use of univariate or bivariate analyses. It was also possible to classify the municipalities according to whether the analyzed factors presented favorable or unfavorable conditions to accessibility to the diagnosis of the TB patients. The results expressed in the factorial plan confirm that it is a valuable tool to guide and direct the health professionals in making decisions, observing differences, defining management strategies and acquiring knowledge about the dimension and complexity that characterize the accessibility to the TB diagnosis.

The decentralization of the TB actions to the PSF does not present a satisfactory performance concerning the accessibility to the diagnosis. The organization form of TB care did not guarantee the accessibility to the early diagnosis of TB.

REFERENCES

1. Alves R, Sant'anna CC, Cunha AJLA. Epidemiologia da tuberculose infantil na cidade do Rio de Janeiro. *Rev Saude Publica*. 2000;34(4):409-10. DOI:10.1590/S0034-89102000000400015
2. Benzécri JP. L' Analyse des Donnéss. II. L' Analyse des Correspondances, Paris: Dunod; 1982.
3. Bodstein R. Atenção básica na agenda da saúde. *Cienc Saude Coletiva*. 2002;7(3):401-12. DOI:10.1590/S1413-81232002000300002
4. Carvalho H. Análise multivariada de dados qualitativos. Lisboa: Edições Silabo; 2004.
5. Cavalcanti ZR, Albuquerque MFPM, Campelo ARL, Ximenes R, Montarroyos U, Verçosa MKA. Características da tuberculose em idosos no Recife (PE): contribuição para o programa de controle. *J Bras Pneumol*. 2006;32(6):535-43. DOI: 10.1590/S1806-37132006000600011
6. Elias PE, Ferreira CW, Alves MCG, Cohn A, Kishima V, Escrivão Jr A, et al. Atenção básica em saúde: comparação entre PSF e UBS por estrato de exclusão social no município de São Paulo. *Cienc Saude Coletiva*. 2006;11(3):633-41. DOI: 10.1590/S1413-81232006000300012
7. Frieden TR, Driver CR. Tuberculosis control: past 10 years and future progress. *Tuberculosis (Edinb)*. 2003;83(1-3):82-5
8. Gazetta CE, Takayanaghi AMM, Costa Jr ML, Villa TCS, Vendramini SHF. Aspectos epidemiológicos da tuberculose em São José do Rio Preto SP, a partir das notificações da doença em um hospital escola (1993 1998). *Pulmão RJ*. 2003;12(3):155-62.
9. Ibanez N, Rocha JSY, Castro PC, Ribeiro MCSA, Forster AC, Novaes MHD, et al. Avaliação do desempenho da atenção básica no Estado de São Paulo. *Cienc Saude Coletiva*. 2006;11(3):683-703. DOI: 10.1590/S1413-81232006000300016
10. Jamal LF, Moherdaui F. Tuberculose e infecção pelo HIV no Brasil: magnitude do problema e estratégias para o controle. *Rev Saude Publica*. 2007;41(Supl 1):104-10.
11. Jaramilho E. Em compassing treatment with prevention: the path for a lasting controlo f tuberculosis. *Soc Sci Med*. 1999;49(3):393-404. DOI: 10.1016/S0277-9536(99)00114-8
12. Macinko J, Almeida C, Oliveira E. Avaliação das características dos serviços de atenção básica em Petrópolis: teste de uma metodologia. *Rev Saude Debate*. 2003;27(65):243-56.
13. Macinko J, Almeida C. 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: Organização Pan-Americana da Saúde; 2006. (Série técnica desenvolvimento de sistemas e serviços de saúde, 10)
14. Mota JC, Vasconcelos AGG, Assis SG. Análise de correspondência como estratégia para descrição do perfil da mulher vítima do parceiro atendida em serviço especializado. *Cienc Saude Coletiva*. 2007;12(3):799-809. DOI: 10.1590/S1413-81232007000300030
15. Muniz JN, Palha PF, Monroe AA, Gonzales RIC, Ruffino Netto A, Villa TCS. A incorporação da busca ativa de sintomáticos respiratórios para o controle da tuberculose na prática do agente comunitário de saúde. *Cienc Saude Coletiva*. 2005;10(2):315-21. DOI: 10.1590/S1413-81232005000200009
16. Rezende EM, Sampaio IBM, Ishitani LH. Causa múltiplas de morte por doenças crônico-degenerativas: uma análise multidimensional. *Cad Saude Publica*. 2004;20(5):1223-31. DOI: 10.1590/S0102-311X2004000500016
17. Ruffino Netto A. Tuberculose: a calamidade negligenciada. *Rev Soc Bras Med Trop*. 2002;35(1):51-8. DOI:10.1590/S0037-86822002000100010
18. Ruffino Netto A, Villa TCS, organizadores. Tuberculosis Treatment - DOTS implementation in some regions of Brazil. Background and regional features. Brasília: OPAS; 2007
19. Selig L, Belo M, Cunha AJLA Teixeira EG, Brito R, Luna AL, et al. Óbitos atribuídos à tuberculose no Estado do Rio de Janeiro. *J Bras Pneumol*. 2004;30(4):335-42. DOI:10.1590/S1806-37132004000400006
20. Starfield B. Primary care. Balancing health needs, services, and technology. New York: Oxford University Press; 1998.
21. Travassos C, Viacava F, Fernandes C, Almeida CM. Desigualdades geográficas e sociais na utilização de serviços de saúde no Brasil. *Cienc Saude Coletiva*. 2000;5(1):133-49. DOI:10.1590/S1413-81232000000100012
22. Vendramini SHF, Gazetta CE, Chiaravalotti Netto F, Cury MRCO, Meirelles EB, Kuyumjian FG, et al. Tuberculose em município de porte médio do sudeste do Brasil: indicadores de morbidade e mortalidade, de 1985 a 2003. *J Bras Pneumol*. 2005;31(3):237-43. DOI: 10.1590/S1806-37132005000300010
23. Viana ALD, Fausto MCR, Lima LD. Política de Saúde e Eqüidade. *Sao Paulo Perspec*. 2003;17(1):58-68. DOI: 10.1590/S0102-88392003000100007
24. Word Health Organization. Tuberculosis control: surveillance, planning, financing. Geneva; 1999.
25. World Health Organization. Global tuberculosis control: surveillance, planning, financing. Geneva; 2007.

Research financed by *Conselho Nacional de Desenvolvimento Científico e Tecnológico* (CNPq – National Council for Scientific and Technological Development; Neglected Diseases Public Notice, process 410547/2006-9).
Scatena LM was supported by *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (Capes - Brazilian Ministry of Education's foundation for the qualification of higher education professors; PRODOC grant).

ANNEX

Burt Table, absolute frequency of cross tabulation of all the categories of the participants' responses. Municipalities of Ribeirão Preto, São José do Rio Preto, Itaboraí - Southeastern Brazil - Campina Grande, Feira de Santana - Northeastern Brazil, 2007.

	V1 1	V1 2	V1 3	V1 4	V1 5	V2 1	V2 2	V2 3	V2 4	V2 5	V3 1	V3 2	V3 3	V3 4	V3 5	V4 1	V4 2	V4 3	V4 4	V4 5	V5 1	V5 2	V5 3	V5 4	V5 5	V6 1	V6 2	V6 3	V6 4	V6 5	V7 1	V7 2	V7 3	V7 4	V7 5	Total
V1:1	50	0	0	0	0	18	7	2	4	19	27	5	2	2	14	35	3	3	1	8	30	2	4	2	12	35	3	1	3	8	12	1	3	4	30	350
V1:2	0	17	0	0	0	3	1	2	2	9	6	2	2	2	5	13	0	0	0	4	9	0	0	1	7	6	2	3	1	5	2	3	2	2	8	119
V1:3	0	0	33	0	0	7	3	3	2	18	15	3	6	3	6	19	1	3	1	9	13	2	5	2	11	13	2	7	2	9	12	2	2	3	14	231
V1:4	0	0	0	47	0	15	4	3	0	25	15	3	5	0	24	34	2	0	0	11	24	1	2	1	19	18	5	3	4	17	20	2	3	2	20	329
V1:5	0	0	0	0	364	105	6	18	10	225	127	20	38	15	164	263	6	10	6	79	198	8	18	7	133	32	9	9	29	285	158	15	18	10	163	2548
V2:1	18	3	7	15	105	148	0	0	0	0	78	11	11	6	42	132	1	1	1	13	110	4	4	2	28	38	5	9	13	83	63	10	10	4	61	1036
V2:2	7	1	3	4	6	0	21	0	0	0	12	3	0	1	5	18	2	0	0	1	12	1	1	1	6	4	4	2	5	6	7	1	2	4	7	147
V2:3	2	2	3	3	18	0	0	28	0	0	13	2	6	1	6	17	3	1	0	7	13	4	1	0	10	3	2	0	4	19	9	2	2	4	11	196
V2:4	4	2	2	0	10	0	0	0	18	0	3	3	4	0	8	8	1	5	0	4	7	1	4	1	5	9	0	1	3	5	3	2	0	3	10	126
V2:5	19	9	18	25	225	0	0	0	0	296	84	14	32	14	152	189	5	9	7	86	132	3	19	9	133	50	10	11	14	211	122	8	14	6	146	2072
V3:1	27	6	15	15	127	78	12	13	3	84	190	0	0	0	0	143	5	4	2	36	111	6	9	5	59	45	9	8	16	112	82	5	11	9	83	1330
V3:2	5	2	3	3	20	11	3	2	3	14	0	33	0	0	0	22	1	2	1	7	19	0	2	2	10	10	1	3	3	16	14	3	1	1	14	231
V3:3	2	2	6	5	38	11	0	6	4	32	0	0	53	0	0	30	1	3	0	19	26	1	3	0	23	9	1	4	7	32	17	5	7	3	21	371
V3:4	2	2	3	0	15	6	1	1	0	14	0	0	0	22	0	19	0	0	0	3	15	0	2	0	5	4	3	1	2	12	8	2	2	1	9	154
V3:5	14	5	6	24	164	42	5	6	8	152	0	0	0	0	213	150	5	7	5	46	103	6	13	6	85	36	7	7	11	152	83	8	7	7	108	1491
V4:1	35	13	19	34	263	132	18	17	8	189	143	22	30	19	150	364	0	0	0	0	269	5	17	5	68	69	11	13	25	246	168	18	21	14	143	2548
V4:2	3	0	1	2	6	1	2	3	1	5	5	1	1	0	5	0	12	0	0	0	3	7	1	0	1	3	3	0	2	4	4	2	2	0	4	84
V4:3	3	0	3	0	10	1	0	1	5	9	4	2	3	0	7	0	0	16	0	0	1	1	10	1	3	6	1	1	1	7	4	0	1	2	9	112
V4:4	1	0	1	0	6	1	0	0	0	7	2	1	0	0	5	0	0	0	8	0	0	0	0	6	2	3	0	0	0	5	3	0	0	0	5	56
V4:5	8	4	9	11	79	13	1	7	4	86	36	7	19	3	46	0	0	0	0	111	1	0	1	1	108	23	6	9	11	62	25	3	4	5	74	777
V5:1	30	9	13	24	198	110	12	13	7	132	111	19	26	15	103	269	3	1	0	1	274	0	0	0	0	53	11	10	22	178	132	18	16	11	97	1918
V5:2	2	0	2	1	8	4	1	4	1	3	6	0	1	0	6	5	7	1	0	0	0	13	0	0	0	2	1	0	2	8	8	1	0	0	4	91
V5:3	4	0	5	2	18	4	1	1	4	19	9	2	3	2	13	17	1	10	0	1	0	0	29	0	0	10	0	2	0	17	10	0	1	2	16	203
V5:4	2	1	2	1	7	2	1	0	1	9	5	2	0	0	6	5	0	1	6	1	0	0	0	13	0	7	0	1	0	5	4	0	1	0	8	91
V5:5	12	7	11	19	133	28	6	10	5	133	59	10	23	5	85	68	1	3	2	108	0	0	0	0	182	32	9	10	15	116	50	4	10	8	110	1274
V6:1	35	6	13	18	32	38	4	3	9	50	45	10	9	4	36	69	3	6	3	23	53	2	10	7	32	104	0	0	0	0	37	5	6	6	50	728
V6:2	3	2	2	5	9	5	4	2	0	10	9	1	1	3	7	11	3	1	0	6	11	1	0	0	9	0	21	0	0	0	4	2	2	2	11	147
V6:3	1	3	7	3	9	9	2	0	1	11	8	3	4	1	7	13	0	1	0	9	10	0	2	1	10	0	0	23	0	0	5	2	2	1	13	161
V6:4	3	1	2	4	29	13	5	4	3	14	16	3	7	2	11	25	2	1	0	11	22	2	0	0	15	0	0	0	39	0	17	6	2	7	7	273
V6:5	8	5	9	17	285	83	6	19	5	211	112	16	32	12	152	246	4	7	5	62	178	8	17	5	116	0	0	0	0	324	141	8	16	5	154	2268
V7:1	12	2	12	20	158	63	7	9	3	122	82	14	17	8	83	168	4	4	3	25	132	8	10	4	50	37	4	5	17	141	204	0	0	0	0	1428
V7:2	1	3	2	2	15	10	1	2	2	8	5	3	5	2	8	18	2	0	0	3	18	1	0	0	4	5	2	2	6	8	0	23	0	0	0	161
V7:3	3	2	2	3	18	10	2	2	0	14	11	1	7	2	7	21	2	1	0	4	16	0	1	1	10	6	2	2	2	16	0	0	28	0	0	196
V7:4	4	2	3	2	10	4	4	4	3	6	9	1	3	1	7	14	0	2	0	5	11	0	2	0	8	6	2	1	7	5	0	0	0	21	0	147
V7:5	30	8	14	20	163	61	7	11	10	146	83	14	21	9	108	143	4	9	5	74	97	4	16	8	110	50	11	13	7	154	0	0	0	0	235	1645
Total	350	119	231	329	2548	1036	147	196	126	2072	1330	231	371	154	1491	2548	84	112	56	777	1918	91	203	91	1274	728	147	161	273	2268	1428	161	196	147	1645	25039