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MANAGEMENT CAPACITY OF PRIMARY HEALTH CARE FOR TUBERCULOSIS CONTROL IN DIFFERENT REGIONS OF BRAZIL

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ABSTRACT

Objective: to analyze the management capacity of primary health care for tuberculosis control.

Method: cross-sectional study. Population: primary health care professional active in tuberculosis control. Data collection: instrument and questionnaire based on evaluation proposal of local institutional capacity for the chronic illness care model, adapted for tuberculosis care. In the data analysis, the mean score of answers to each instrument question was calculated and multiple correspondence analysis was applied.

Results: in primary health care, the management capacity for tuberculosis control presented unfavorable results for: scheduling the tuberculosis treatment medical consultation and laboratory tests in computerized registration system, non-use of formal and written communication for the referral of tuberculosis cases. In addition, the community health worker does not interact with the service team and does not articulate with the community resources. Expert support and health professional training for tuberculosis treatment are limited.

Conclusion: the organizational capacity of the primary care services in the investigated cities presents a negative assessment for the access to the monitoring/surveillance systems, planning, training and community articulation for tuberculosis controls, aspects that influence the feasibility of the policies for changes in the care model for tuberculosis as a chronic condition.

DESCRIPTORS: Tuberculosis. Health services research. Primary health care. Operations research. Health management.

CAPACIDADE GERENCIAL DA ATENÇÃO PRIMÁRIA À SAÚDE PARA O CONTROLE DA TUBERCULOSE EM DIFERENTES REGIÕES DO BRASIL

RESUMO

Objetivo: analisar a capacidade gerencial da atenção primária à saúde para o controle da tuberculose.

Método: pesquisa avaliativa, de delineamento transversal. População: profissionais de saúde da atenção primária à saúde que atuavam no controle da tuberculose. Coleta de dados: instrumento e questionário baseados na proposta de avaliação da capacidade institucional local, para o modelo de atenção às condições crônicas, adaptado para a atenção à tuberculose. Na análise dos dados, calculou-se o escore médio das respostas a cada questão do instrumento e realizou-se a análise de correspondência múltipla.

Resultados: a capacidade gerencial, na atenção primária à saúde, para o controle da tuberculose, apresentou resultados desfavoráveis para: agendamento no sistema de registro informatizado de consulta médica e exames de laboratório no tratamento de tuberculose, não utilização de comunicação formal e escrita para a referência dos casos de tuberculose. Além disso, o agente comunitário de saúde não se integra à equipe da unidade e não faz articulação com os recursos da comunidade e o apoio de especialista e a capacitação dos profissionais de saúde para o tratamento da tuberculose é limitado.

Conclusão: a capacidade organizacional dos serviços de atenção primária à saúde, nos municípios pesquisados, apresenta avaliação desfavorável para o acesso aos sistemas de monitoramento/vigilância, planejamento, capacitação e articulação com a comunidade para o controle da tuberculose, quesitos os quais influenciam a viabilização das políticas para mudanças no modelo de atenção à tuberculose como condição crônica.

DESCRITORES: Tuberculose. Avaliação de serviços de saúde. Atenção primária à saúde. Pesquisa operacional. Gestão em saúde.

CAPACIDAD GERENCIAL DE LA ATENCIÓN PRIMARIA A LA SALUD PARA EL CONTROL DE LA TUBERCULOSIS EN DIFERENTES REGIONES DE BRASIL

RESUMEN

Objetivo: analizar la capacidad gerencial de la atención primaria a la salud para el control de la tuberculosis.

Método: investigación evaluativa, de delineamiento transversal. Población: profesionales de salud de la atención primaria a la salud que actuaban en el control de la tuberculosis. Recolección de datos: instrumento y cuestionario basados en la propuesta de evaluación de la capacidad institucional local, para el modelo de atención a las condiciones crónicas, adaptado para la atención a la tuberculosis. En el análisis de los datos, se calculó el puntaje medio de las respuestas a cada cuestión del instrumento y se realizó el análisis de correspondencia múltiple.

Resultados: la capacidad gerencial, en la atención primaria a la salud, para el control de la tuberculosis, presentó resultados desfavorables para: programación en el sistema de registro informatizado de consulta médica y exámenes de laboratorio en el tratamiento de tuberculosis, no utilización de comunicación formal y escrita para la intervención referencia de los casos de tuberculosis. Además, el agente comunitario de salud no se integra al equipo de la unidad y no hace articulación con los recursos de la comunidad y el apoyo de especialista y la capacitación de los profesionales de salud para el tratamiento de la tuberculosis es limitado.

Conclusión: la capacidad organizativa de los servicios de atención primaria a la salud, en los municipios encuestados, presenta una evaluación desfavorable para el acceso a los sistemas de monitoreo/vigilancia, planificación, capacitación y articulación con la comunidad para el control de la tuberculosis, que influyen en la viabilidad de las políticas para cambios en el modelo de atención a la tuberculosis como condición crónica

DESCRIPTORES: Tuberculosis. Investigación en servicios de salud. Atención primaria de salud. Investigación operativa. Gestión en salud.

INTRODUCTION

This article is part of a series of studies that have been developed in three regions of Brazil. The focus is the evaluation of the organization and management of health services and systems for tuberculosis (TB) control in primary health care (PHC) in the cities, considering: access to diagnosis,^{1,2} TB treatment,^{3,4} contacts tracing and cascade of care.⁵ Therefore, methods and evaluation tools are used in the studies that were elaborated and adapted for TB care, according to the different actors involved, namely TB patients, health professionals and managers.

The contexts of the study, regarding the organization of the TB care system in health systems in

three different regions of Brazil, as well as data collection tools and theoretical frameworks, represent methodological and conceptual challenges, as there is no single tool that can assess the multiplicity of dimensions for healthcare management.⁶ The evaluation of the implementation of specific activities for TB cannot be dissociated from the understanding of the local context, the structure and organization of the health system and aspects that influence the feasibility of current policies.

These studies are carried out in urban centers of three Brazilian regions that innovate in considering, in the results, the differences, weaknesses/potentials and challenges for TB care in PHC, a disease that demands healthcare and professional

efforts that favor broader, multiprofessional and intersectoral care.^{3,7}

In Brazil, despite the availability of a greater supply of TB control actions in PHC, the healthcare network is mostly disarticulated, poorly distributed and poorly equipped.⁸⁻¹⁰ The local health systems present complex and heterogeneous realities concerning this level of care, such as the coverage percentage of primary health care services (PHCS), access to the computer system for TB care at the PHCS and the care process (offering medical/nursing, management and monitoring actions of TB cases in PHCS).

These aspects indicate the need for studies that include indicators and perspectives on the peculiarities related to the structuring of the local health network and the teamwork process, in the form of embracing and providing care to TB patients.

Difficulties identified in relation to the incorporation of TB control actions in PHC have shown the existence of a close relationship between the factors related to the failure of TB treatment and the way in which control actions are performed at this point of care. Among the challenges for TB control in PHC, barriers related to the flow of care, referral and counter-referral are identified, as well as weaknesses in the integration of staff and care levels and actions and services, and the influence of the lack of prioritization of TB actions in the network structure in order to change the care and management model.¹¹⁻¹²

The management and control of TB, as an infectious disease, have more in common with conditions involving long-term, continuous and coordinated care based on the PHC level, and which offer actions that promote treatment compliance and lifestyle changes.¹³ Therefore, within the chronic illness scope, TB management offers evidence that supports care planning to include individual, social and cultural aspects of the patient, aiming for co-accountability among health services, patients and the family for care¹⁴⁻¹⁵ which thus requires the

establishment of an integrated care network that favors the users' continued access among the different care points and enhances the articulation among the management entities,¹⁶ which involve the care, service and program management.

Considering the dimensions for the evaluation of institutional capacity in TB control, this study addresses the organizational dimension of care, defined as "the dimension performed in health services, marked by the technical and social division of work, and which highlights new elements, such as: teamwork, coordination and communication activities, as well as the management function itself. In this dimension, the organization of the work process plays a central role, particularly the definition of flows and rules of service and the adoption of shared devices by all professionals, such as: agendas, single protocols, team meetings, planning, evaluation, etc. Here, care management depends on the cooperative action of various actors, to be achieved in territories often marked by dissent, difference, disputes and asymmetries of power".^{6:591}

Thus, the objective of this study was to analyze the management capacity of PHC for TB control in three Brazilian regions.

METHOD

Cross-sectional study and quantitative evaluation research.

The study was developed in cities in the Northeast (Natal, RN; João Pessoa, PB), Southeast (Uberaba, MG; São José do Rio Preto, SP; Rio de Janeiro, RJ - Program Area (PA) 3.1, Complexo da Maré) and South (Foz do Iguaçu, PR) of Brazil. Those cities were included in the study because they are priority cities for TB control and because they decentralized the execution of disease control actions to PHC and present a partnership between health service teams and academics.

In Table 1, the description of the population data and the epidemiological information of TB at the places of study are displayed:

Table 1 - Population data and epidemiological information on tuberculosis in six cities from different Brazilian regions, 2013.

	Foz do Iguaçu (PR)	Natal (RN)	João Pessoa (PB)	Uberaba (MG)	Complexo da Maré (RJ)	São José do Rio Preto (SP)
Estimated population	255,718	869,954	769,607	315,360	129,770	434,039
FHS coverage ^a	41.2%	44.3%	81.8%	52.4%	50.0%	24.9%
Number of tuberculosis cases	126	311	506	54	170	136

Outcome						
Cure rate	53.2%	62.2%	74.2%	72.2%	74.7%	81.6%
Abandonment rate	21.4%	7.2%	9.5%	13.0%	23.5%	5.9%
Death rate	4.8%	2.1%	3.6%	14.8%	0.6%	3.7%
Proportion of tuberculosis cases with monthly monitoring in PHC [†]	No information	100%	19%	12.0%	100%	65.9%
Proportion of tuberculosis cases in DOT [‡] through PHC	75.4%	14.2%	22%	65.0%	53.2%	69.8%

[†]Family Health Strategy; [‡]Primary Health Care; [§]Directly Observed Treatment.

Sources: IBGE, 2016¹⁷; DAB, 2016¹⁸; SINAN, 2016¹⁹; TBWEB, 2016²⁰

The study population consisted of key informants, comprising health professionals (nurses, auxiliary nurses and nursing technicians, Community Health Workers (CHW) and physicians) of PHC services, who were active in the treatment of TB patients.

The inclusion criteria for the interview with health professionals were: to be a health professional working in PHC during the data collection period, from October 2013 to February 2014, and to have monitored, at least once, TB patients in the last six months prior to the collection date.

Through the National Registry of Health Establishments, the number of professionals working in the PHC services of each city participating in the study was searched. After this search, contact was made with the coordination of the municipal TB control program, or directly with the health services, in order to identify how many and which professionals had already provided care and monitored TB patients.

Subsequently, the sample size was calculated, considering the following parameters: sample error of 0.05; 95% confidence interval and p (proportion of the population) of 50%, with the following equation:

$$n_0 = \frac{p(1-p)Z^2}{e^2}$$

As the population was finite, the minimum sample of professional to be interviewed in each city studied was corrected using the equation below.

$$n = \frac{n_0}{1 + (n_0 - 1 / N)}$$

Thus, 618 professionals were interviewed, being 82 from Joao Pessoa, 100 from Natal, 173 from Rio de Janeiro, 70 from São José do Rio Preto, 100 from Uberaba and 93 from Foz do Iguaçu.

In order to analyze the management capacity of PHC for TB control in three Brazilian regions, different sources of data collection were used, as well as different instruments and questionnaires:

1) an instrument for the characterization of the cities' TB care system in relation to the installed capacity, which contained both structural information and the work process of the teams for patient care, such as: number of Basic Health Units (BHU), Health Centers (CS) and Family Health Unit (USF); Directly Observed Treatment (DOT), team that monitors TB cases at PHCS, care coordination among staff, coordination of work among health services, integration among programs, health services and professional, registries and computerized system for TB care, access to information and care process (supply of medical, management and monitoring actions for TB cases);

2) structured questionnaire based on the proposal of the MacCooll Institute for Health Care Innovation, Assessment of Chronic Illness Care (ACIC)²¹, for the "evaluation of the local institutional capacity to develop the chronic illness care model" adapted⁴ to assess the actions developed to control TB. This questionnaire consists of questions that address the evaluation of TB care in the following dimensions: organization of TB care; articulation with the community; supported self-care; decision support; design of the service system; clinical information and integration systems of the components of the care model for TB patients, through which answers can be obtained at four levels (A, B, C, D), A being the most favorable, B and C intermediary, and D the most unfavorable. Scores ranging from 0 to 11 were used to represent the response scales. Scores from 0 to 2 were allocated to level D, 3 to 5 to C, 6 to 8 to B, and 9 to 11 to A.

It is worth noting that, for the present study, only variables in some dimensions were selected to

□ Fapesp Regular Project "Assessment of health service integration for tuberculosis treatment in primary care in the care networks in Brazilian regions".

permit the analysis of TB care management according to the guiding concept of the aforementioned organizational dimension, with emphasis on indicators that could assess aspects of the management capacity for TB care. Those variables are set out in Chart 1.

In the data analysis, the average score of the answers to each instrument question was calculated, also calculating the corresponding standard deviation. In addition, to identify the existence of an association between the active variables (Chart 1) and the supplementary variable (cities of the study), multiple correspondence analysis (MCA) was applied.

In the MCA, the highest percentage of variability in the data set was explained by the combination of variables with greater stability in the multidimensional space. The active variables play the main role in determining the results available in the factorial plans. After describing the factorial space in terms of the associations between the active variables, the supplementary variable could be included. Variable A1 (benefits and incentives) was the only one that presented lower eigenvalue, being disregarded in the analysis due to lower stability in the multidimensional space.

Chart 1 - Active variables to assess management capacity aspects of Primary Health Care for tuberculosis care

Management capacity of Primary Health Care for tuberculosis care	G1 - Interest of health service managers regarding changes in tuberculosis care G2 - Targets set by health service for tuberculosis control in coverage area G3 - Improvement strategies for tuberculosis care G4 - Strategies for Primary Health Care to be the place of treatment for tuberculosis G5 - Participation of health service manager to improve tuberculosis care G6 - Availability of guideline manual for tuberculosis control at the health service G7 - Training of health professionals for tuberculosis care G8 - Monitoring of tuberculosis situation in the community G9 - Information feedback from surveillance / TCP coordination on service performance G10 - Tuberculosis care planning includes performance-based incentives for health service
Care capacity of Primary Health Care for tuberculosis care	A1 - Benefits and incentives for tuberculosis patients A2 - Partnerships with community organizations for tuberculosis control A3 - Community health worker participates in tuberculosis treatment and articulates with team/community A4 - Expert participation in support for health professionals from the service A5 - Teamwork for tuberculosis control A6 - Health professional from the service which is a reference for tuberculosis control A7 - Appointment system for tuberculosis treatment A8 - Continuity of care for tuberculosis patients A9 - Registration in clinical file and computerization A10 - Information registration form of tuberculosis patients

Finally, the pattern of interdependence between the variables was analyzed by means of residual analysis (difference between observed and expected), in a standardized and adjusted form, so that only variables with residuals superior to 1.96 were maintained in the factorial plans, indicating a statistically significant association between the variables. Thus, a factorial space could be created for the set of categories of the variables and their associations could be interpreted. The level of statistical significance adopted for the analyses was 5%.

The study received approval from the Research Ethics Committee of the University of São

Paulo at Ribeirão Preto College of Nursing, according to CAAE protocol 15671713.9.1001.53.93.

RESULTS

The coverage of the Family Health Service (FHS), in relation to the population data in the city, was classified as: above 80% (1); between 40 and 55% (4) and below 25% (1). Taking into account the maturity and the deployment time of TB control actions in PHC, this happened for more than five years in five cities and recently in one.

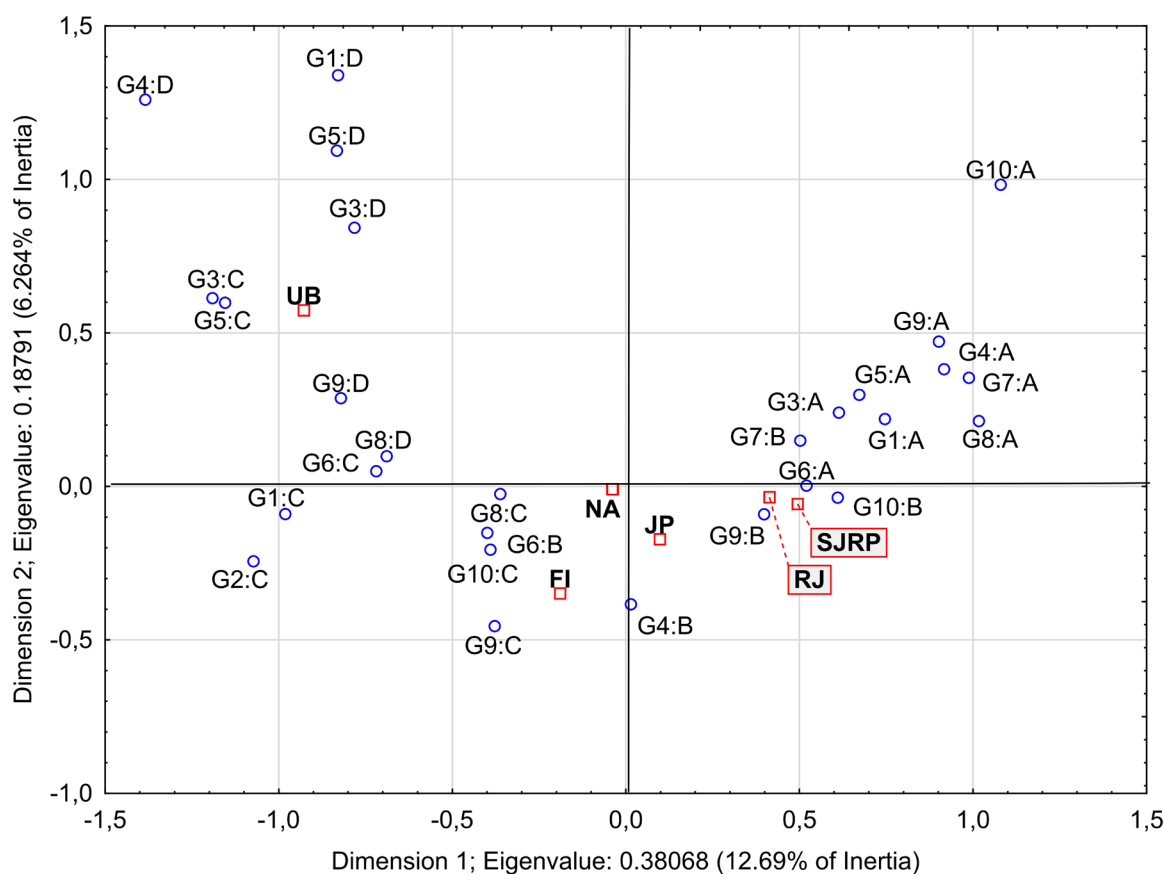
In relation to the services offered, such as the

medical consultation (MC) for TB treatment monitoring with regular appointment, this event was observed in three cities (São José do Rio Preto - SJRP, Rio de Janeiro - RJ, Uberaba - UB), and spontaneous unscheduled demand in three (João Pessoa - JP, Natal - NA, Foz do Iguacu - FI). In relation to the supply of DOT in the PHCS, the coverage was classified below 25% (2) and between 50 and 75.4% (4).

The computerized system for TB care in PHC had been implemented for MC scheduling and laboratory tests in two cities, FI and SJRP. RJ had a computerized system for laboratory tests for TB (GAL Prime). The cities' referral system for TB care did not use formal communication with registration

and nor were guidelines established.

On the positive side of dimension 1 of the factorial plan (Figure 1), there was a favorable management capacity for PHC for the development of TB control actions. Associated with this result, the cities RJ and SJRP were found. On the negative side of dimension 1 of this factorial plan, there were unfavorable management conditions. Associated with these, the city of UB was found. In Figure 1, the cities of JP, NA and FI approached the origin of dimension 1 and, therefore, represent the average profile of the evaluated items, that is, their management capacity destined to PHC for the development of TB control actions was evaluated as regular.



JP - João Pessoa; FI - Foz do Iguacu; NA - Natal; RJ - Rio de Janeiro (Complexo da Maré); SJRP - São José do Rio Preto; UB - Uberaba; G1 - Interest of health service managers regarding changes in tuberculosis care; G2 - Targets set by health service for tuberculosis control in coverage area; G3 - Improvement strategies for tuberculosis care; G4 - Strategies for Primary Health Care to be the place of treatment for tuberculosis; G5 - Participation of health service manager to improve tuberculosis care; G6 - Availability of guideline manual for tuberculosis control at the health service; G7 - Training of health professionals for tuberculosis care; G8 - Monitoring of tuberculosis situation in the community; G9 - Information feedback from surveillance/ TCP coordination on service performance; G10 - Tuberculosis care planning includes performance-based incentives for health service; A, B, C and D, A being the most favorable capacity, B and C intermediary, and D, most unfavorable.

Figure 1 - Management capacity of Primary Health Care for tuberculosis care in cities from three Brazilian regions, 2013/2014

These results reflect the mean scores of each item assessed separately (Table 2). It can also be identified that the variable negatively assessed in all

cities in the study refers to the health professionals' training for TB care.

Table 2 - Descriptive analysis of management capacity of primary health care for tuberculosis care in cities in different Brazilian regions, 2013/2014.

	João Pessoa	Foz do Iguaçu	Natal	Rio de Janeiro	São José do Rio Preto	Uberaba
	$\bar{x} \pm dp$	$\bar{x} \pm dp$	$\bar{x} \pm dp$	$\bar{x} \pm dp$	$\bar{x} \pm dp$	$\bar{x} \pm dp$
G1	8.02±2.45	7.20±2.48	7.37±3.12	8.10±2.39	8.73±2.63	4.68±3.50
G2	8.43±2.60	7.76±2.63	7.65±3.04	8.29±2.44	8.76±2.99	6.56±2.93
G3	7.84±2.83	7.42±2.35	8.11±2.82	7.95±2.28	9.29±2.30	7.20±2.46
G4	7.76±2.30	7.20±2.12	7.81±1.92	7.53±2.11	8.27±1.78	4.45±3.30
G5	8.37±2.16	6.94±2.55	7.16±2.67	8.04±1.91	7.47±2.52	4.44±3.17
G6	7.34±3.13	7.72±2.72	8.13±3.01	7.82±2.88	9.61±1.91	6.85±2.50
G7	4.40±3.35	4.10±3.54	4.64±3.30	5.72±3.47	5.00±3.04	3.92±3.03
G8	5.91±2.35	5.60±2.46	5.13±2.77	6.79±2.84	6.30±2.53	5.29±1.84
G9	5.83±3.22	4.71±3.17	5.17±3.16	6.47±3.08	6.57±2.56	3.98±2.67
G10	5.67±1.74	5.33±1.97	5.11±2.05	6.54±2.13	6.30±1.88	4.62±1.66
	6.96±2.96	6.40±2.91	6.63±3.12	7.32±2.72	7.63±2.84	5.20±2.99

G1 - Interest of health service managers regarding changes in tuberculosis care; G2 - Targets set by health service for tuberculosis control in coverage area; G3 - Improvement strategies for tuberculosis care; G4 - Strategies for Primary Health Care to be the place of treatment for tuberculosis; G5 - Participation of health service manager to improve tuberculosis care; G6 - Availability of guideline manual for tuberculosis control at the health service; G7 - Training of health professionals for tuberculosis care; G8 - Monitoring of tuberculosis situation in the community; G9 - Information feedback from surveillance/ TCP coordination on service performance; G10 - Tuberculosis care planning includes performance-based incentives for health service.

In Figure 2 and Table 3, the capacity for TB care in the cities presented considerable response variation, as the approximation of the response categories did not follow a logical distribution.

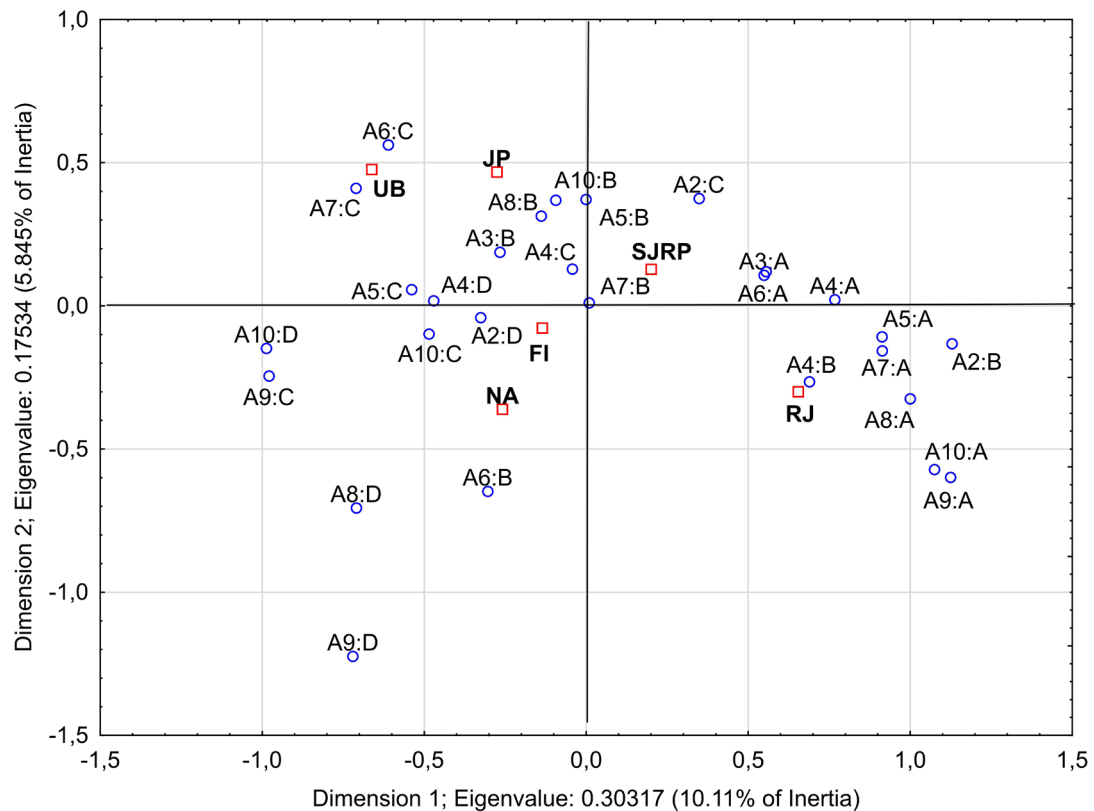
The variables with the best evaluation were closer to the city of Rio de Janeiro. São José do Rio Preto had an intermediary evaluation, and the other cities were dispersed between intermediate and bad responses.

The variable "benefits and incentives for tuber-

culosis patients" was better evaluated in the cities of João Pessoa and Natal.

The variable "partnerships with community organizations for tuberculosis control" was evaluated unfavorably in all cities.

The variable "expert participation in supporting the health professionals of the service" received intermediary and unfavorable evaluations in the cities studied, except in São José do Rio Preto, where it was better evaluated.



JP - João Pessoa; FI - Foz do Iguaçu; NA - Natal; RJ - Rio de Janeiro (Complexo da Maré); SJRP - São José do Rio Preto; UB - Uberaba; A1 - Benefits and incentives for tuberculosis patients; A2 - Partnerships with community organizations for tuberculosis control; A3 - Community health worker participates in tuberculosis treatment and articulates with team/community; A4 - Expert participation in support for health professionals from the service; A5 - Teamwork for tuberculosis control; A6 - Health professional from the service which is a reference for tuberculosis control; A7 - Appointment system for tuberculosis treatment; A8 - Continuity of care for tuberculosis patients; A9 - Registration in clinical file and computerization; A10 - Information registration form of tuberculosis patients; A, B, C and D, A being the most favorable capacity, B and C intermediary, and D, most unfavorable

Figure 2 - Primary Health Care capacity for tuberculosis care in cities from three Brazilian regions, 2013/2014.

Table 3 - Descriptive analysis of installed primary health care capacity for care to tuberculosis cases in cities in three Brazilian regions, 2013/2014.

	João Pessoa	Foz do Iguaçu	Natal	Rio de Janeiro	São José do Rio Preto	Uberaba
	$\bar{x} \pm dp$	$\bar{x} \pm dp$	$\bar{x} \pm dp$	$\bar{x} \pm dp$	$\bar{x} \pm dp$	$\bar{x} \pm dp$
A1	7.46±2.97	0.99±2.97	8.44±2.29	2.49±3.54	3.40±3.72	0.25±1.36
A2	1.98±2.95	1.08±1.91	1.25±2.69	3.25±3.30	2.67±3.30	0.91±2.00
A3	9.11±1.85	7.47±2.04	7.67±3.73	8.61±1.99	7.87±3.55	7.74±1.43
A4	2.70±2.40	5.19±2.96	2.67±2.20	4.97±3.13	7.99±3.17	3.29±2.62
A5	7.60±2.32	5.41±2.52	6.36±3.21	7.38±2.97	6.83±1.86	6.47±2.32
A6	7.29±2.82	7.27±2.84	8.03±3.04	8.16±2.78	8.07±2.42	5.89±2.93
A7	5.98±2.25	6.81±2.58	7.13±2.20	7.85±2.32	7.89±2.26	5.76±2.44
A8	5.76±3.15	7.19±2.98	5.37±3.32	7.60±2.81	7.30±1.90	6.66±2.04
A9	7.29±1.46	7.45±1.69	7.32±1.63	8.02±2.15	7.46±1.59	5.67±2.06
A10	6.32±1.91	6.35±2.93	6.68±2.08	8.19±2.43	6.59±2.03	5.91±2.43
	6.15±3.24	5.52±3.45	6.09±3.51	6.65±3.50	6.61±3.25	4.85±3.25

A1 - Benefits and incentives for tuberculosis patients; A2 - Partnerships with community organizations for tuberculosis control; A3 - Community health worker participates in tuberculosis treatment and articulates with team/community; A4 - Expert participation in support for health professionals from the service; A5 - Teamwork for tuberculosis control; A6 - Health professional from the service which is a reference for tuberculosis control; A7 - Appointment system for tuberculosis treatment; A8 - Continuity of care for tuberculosis patients; A9 - Registration in clinical file and computerization; A10 - Information registration form of tuberculosis patients.

DISCUSSION

The decentralization experiences of TB actions to PHC demonstrated that cities are in different stages and that this process has been determined by local specificity and by advances in the management process, with each city presenting a form of TB care organization. The difficulty of offering TB control actions in PHC evidenced in this study, even in cities with medium or high FHS coverage, is a reality, due to the small proportions of TB case monitoring and DOT performance at this care point.

In a study in JP, a city with more than 80% of FHS coverage, it was identified that PHC professionals encourage the patient to perform the outpatient treatment for TB, often because they do not know that the disease is one of the priorities of PHC, ignoring the epidemiological policies and data involved.²²

It is verified that the PHCS professionals report having access to manuals and guidelines for TB care, however, there is a mismatch between the transfer of responsibilities from TB control actions to the PHCS and the response capacity of the teams to the care management in some cities studied. In addition, these cities have cure and default rates below the goals established by the National Tuberculosis Control Program.

In studies carried out in the Brazilian Northeast, the implementation form of PHC services was discussed, without the necessary supply of resources that guarantee its full functioning, leading to inefficiency in the quality of the services.²³

The indicators show that PHCS managers still have difficulties to agree with actions aimed at TB control through planning and systematic registration, and the agreed targets are not available to the local team.

It is also verified that, although PHC has contributed to increasing the population's access to health services, the planning and monitoring of the activities developed by this point of care remain problematic.^{14,23-24}

The critical nodes of the management capacity are related to the expansion of services in cities with increasing populations in terms of funding, which affects the availability of human resources,²³ especially in the Northeast, for the monitoring of TB patients. As a result, the nursing team professionals take on the majority of actions against the disease.¹⁰

Regarding the basic and limited evaluation of the supply of benefits and incentives, in some cities, in another study carried out in a city in the Brazilian

Northeast, it was shown that this fragility can lead to the treatment discontinuity and default, making it impossible to comply with goals and achieve cure.²⁵

The evaluation of the professionals was critical with regard to the creation of partnerships with community organizations, which has been verified in other studies.²⁶⁻²⁸ Although the participation of the CHW in the activities related to TB treatment was considered reasonable in this study, this professional do not interact with the PHCS team and does not articulate with the community resources.¹⁰

In some cities, the health professionals do not receive expert support and training for TB treatment is deficient. Therefore, reflection is due on divergences and contradictions regarding the effectiveness of decentralization and on the capacity of care. In some studies, favorable scenarios are pointed out regarding the achievement of treatment outcome indicators, even without the incorporation of all commitments and activities.²⁹⁻³⁰ In others, a decrease in compliance and cure rates³¹ was identified, as well as difficulties in the treatment access and related actions,³²⁻³³ and low integration of actions and health services in the planning of care for TB patients.³⁴

The results presented here point to the low empowerment of PHC in the development of TB control actions, reflecting the lack of political commitment that permeates the management level, as well as the lack of accountability in relation to healthcare actions. Thus, for TB care in PHC, a minimum structure in health services is essential, with preparation of local teams and continuous supervision and back-up of the TCP coordination, so that the activities are effective and respond to the local reality and need.³⁵

In this study, the issue of community-oriented and focused care is the most important gap to be overcome in directing TB control actions. This deficiency was also identified in other studies on the performance of health services for TB care in cities in the State of São Paulo.³⁶⁻³⁷

As verified, regular meetings are fundamental with a view to planning and coordinating teamwork and care focused on disease control, even if there are reference health professionals for this purpose in the service. Therefore, the traditional approach to global needs to be re-evaluated with greater emphasis on multidisciplinary collaboration and integrated strategies.³⁵

The clinical information system for TB care requires professionals to use a variety of tools that need to be completed manually, making it difficult

to share and use information effectively. It should also be highlighted that TB information systems (Sinan and TB-WEB) are not available for access by PHC professionals, so that the information also needs to be transmitted in writing.³⁸

TB care assessed through epidemiological sources and data from the cities under study shows unfavorable results for cure, treatment default and death.

As a limitation in this study, we identify the methodological and conceptual challenge related to the development of the study with health professionals only, who may assess the event studied more positively in relation to what occurs in the reality of care practice.

CONCLUSION

Challenges are present in the management and care capacity of PHC for TB control, as the services at this care level did not present favorable treatment outcomes in the cities, with high rates of treatment default and death.

Obstacles can be identified for developing the organizational capacity of PHC services for TB control in the cities surveyed, considering the aspects that influence the feasibility of the current policies for changes in the care model. This presents restrictions in the transfer of management technologies, such as access to registration and computer systems for therapeutic accompaniment, monitoring/surveillance and action planning and professional training.

Another barrier refers to the social and technical division of health and nursing work, with greater or lesser presence of the CHW in the team, low availability of professionals for TB patient monitoring, such as physicians in cities in the Northeast and South, and the incipient rearguard of experts and articulations with community organizations in disease control. This fact leads to improper care that influences the feasibility of policies for changes in the TB care model as a chronic condition, whose quality varies among the Brazilian regions.

The need for access to integrated TB computer systems is also highlighted, which should be available to the health team for the management of TB patient care in PHC, as the indicators pointed out in this study and the unfavorable rates in the reported outcomes are worrisome.

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REFERENCES

1. Villa TCS, Ponce MAS, Wysocki AD, Andrade RLP, Arakawa T, Scatolin BE, et al. Early diagnosis of tuberculosis in the health services in different regions of Brazil. *Rev Latino-am Enfermagem* [Internet] 2013 Jan/Feb [cited 2017 Mar 13]; 21(spe):190-8. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692013000700024.
2. Silva Sobrinho RA, Ponce MAS, Andrade RLP, Beraldo AA, Pinto ESG, Scatena LM, et al. Effectiveness in the diagnosis of tuberculosis in Foz do Iguaçu, the triple-border area of Brazil, Paraguay and Argentina. *Rev Esc Enferm USP* [Internet]. 2013 Dec [cited 2017 Mar 13]; 47(6):1371-8. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342013000601373&lng=en&nrm=iso&tlng=en.
3. Silva DM, Farias HBG, Villa TCS, Sá LD, Brunello MEF, Nogueira JA. Care production for tuberculosis cases: analysis according to the elements of the Chronic Care Model. *Rev Esc Enferm USP* [Internet]. 2016 Mar/Apr [cited 2017 Mar 13]; 50(2):239-46. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342016000200239.
4. Villa TCS, Andrade RLP, Arakawa T, Magnabosco GT, Beraldo AA, Monroe AA, et al. Satisfação do usuário com os serviços de atenção à tuberculose em Ribeirão Preto, 2008. *Cad Saúde Colet* [Internet]. 2012 [cited 2017 Mar 13]; 20(2):234-43. Available from: http://iesc.ufrj.br/cadernos/images/csc/2012_2/artigos/csc_v20n2_234-243.pdf
5. Wysocki AD, Villa TCS, Arakawa T, Brunello MEF, Vendramini SHF, Monroe AA, et al. Latent tuberculosis infection diagnostic and treatment cascade among contacts in Primary Health Care in a city of Sao Paulo State, Brazil: cross-sectional study. *PlosOne* [Internet]. 2016 Jun [cited 2017 Mar 13]; 11(6):e0155348. Available from: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0155348>
6. Cecilio LCO. Apontamentos teórico-conceituais sobre processos avaliativos considerando as múltiplas dimensões da gestão do cuidado em saúde. *Interface (Botucatu)* [Internet]. 2011 Apr/Jun [cited 2017 Feb

- 22]; 15(37):589-99. Available from: <http://dx.doi.org/10.1590/S1414-32832011000200021>.
7. Scatena LM, Wysocki AD, Beraldo AA, Magnabosco GT, Brunello MEF, Ruffino Netto A, et al. Validity and reliability of a health care service evaluation instrument for tuberculosis. *Rev Saúde Pública* [Internet]. 2015 Feb [cited 2017 Mar 13]; 49:7. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-89102015000100213.
 8. Oliveira CBB, Assolini FEP, Protti ST, Souza KMJ, Monroe AA, Palha PF, et al. Management in Primary Health Care: discourses about the search for respiratory symptomatics of tuberculosis. *Texto Contexto Enferm* [Internet]. 2016 Oct [cited 2017 Mar 13]; 25(3):1-8. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-07072016000300315.
 9. Arakawa T; Magnabosco GT, Lopes LM, Arnaez MAA, Gavín MAO, Gallardo MDPS, et al. Evaluation of the performance of Tuberculosis Control Programs in Brazil and Spain: an integrative review of the literature. *Ciênc Saúde Coletiva* [Internet]. 2015 Dec [cited 2017 Mar 13]; 20(12):3877-89. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-81232015001203877&lng=en&nrm=iso&tlng=en.
 10. Silva DM, Nogueira JÁ, Sá LD, Wysocki AD, Scatena LM, Villa TCS. Performance evaluation of primary care services for the treatment of tuberculosis. *Rev Esc Enferm USP* [Internet]. 2014 Dec [cited 2017 Mar 13]; 48(6):1044-53. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342014000601044
 11. Brunello MEF, Andrade RLP, Monroe AA, Arakawa T, Magnabosco GT, Orfão NH, et al. Tuberculosis diagnostic pathway in a municipality in south-eastern Brazil. *Int J Tuberc Lung Dis* [Internet]. 2013 Oct [cited 2017 Mar 13]; 17(Suppl 1):41-7. Available from: <http://www.ingentaconnect.com/contentone/iatld/ijtld/2013/00000017/A00110s1/art00010>.
 12. Assis EG, Beraldo AA, Monroe AA, Scatena LM, Cardozo Gonzales RI, Palha PF, et al. The coordination of care for tuberculosis control. *Rev Esc Enferm USP* [Internet]. 2012 Feb [cited 2017 Mar 13]; 46(1):111-8. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342012000100015&lng=en&nrm=iso&tlng=en
 13. Escorel S, Giovanella L, Mendonça MHM, Senna MCM. O Programa de Saúde da Família e a construção de um novo modelo para a atenção básica no Brasil. *Rev Panam Salud Publica* [Internet]. 2007 [cited 2017 Mar 14]; 21 (2/3): 164-76. Available from: <http://www.scielosp.org/pdf/rpsp/v21n2-3/11.pdf>.
 14. Barrêto AJR, Sá LD, Nogueira JA, Palha PF, Pinheiro PGOD, Farias NMP et al. Organização dos serviços de saúde e a gestão do cuidado à tuberculose. *Ciênc saúde coletiva* [Internet]. 2012 Jul [cited 2017 Mar 13]; 17(7):1875-84. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-81232012000700027
 15. Cunha NV, Cavalcanti MLT, Costa AJL. Diagnóstico situacional da descentralização do controle da tuberculose para a Estratégia Saúde da Família em Jardim Catarina, São Gonçalo, RJ, 2010. *Cad Saúde Coletiva* [Internet]. 2012 [cited 2017 Mar 13]; 20(2):177-87. Available from: http://www.cadernos.iesc.ufrj.br/cadernos/imagens/csc/2012_2/artigos/csc_v20n2_177-187.pdf.
 16. Almeida PF, Giovanella L, Mendonça MHM, Escorel S. Desafios à coordenação dos cuidados em saúde: estratégias de integração entre níveis assistenciais em grandes centros urbanos. *Cad Saúde Pública* [Internet]. 2010 Feb [cited 2017 Feb 23]; 26(2):286-98. Available from: <http://dx.doi.org/10.1590/S0102-311X2010000200008>.
 17. Instituto Brasileiro de Geografia e Estatística. IBGE cidades [internet]. Brasília (DF): 2016 [cited 2016 Nov 26]. Available from: <https://cidades.ibge.gov.br/brasil/panorama>
 18. Departamento de Atenção Básica. Informação e Gestão da Atenção Básica. Cobertura da Atenção Básica [internet]. Brasília (DF): 2016 [cited 2016 Ago 15]. Available from: <https://egestorab.saude.gov.br/paginas/acesoPublico/relatorios/reHistoricoCoberturaAB.xhtml?jsessionId=UKM2sWYlg9daAiyxOYd9n1f>
 19. Departamento de Processamento de Dados do Sistema Único de Saúde. Sistema de Informação de Agravos de Notificação SINAN. Brasília (DF): 2016 [cited 2016 Out 02]. Available from: <http://www2.datasus.gov.br/DATASUS/index.php?area=0203&id=31009407&VObj=http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sinanet/cnv/tuberc>
 20. Governo do Estado de São Paulo. Centro de Vigilância Epidemiológica Prof. Alexandre Vranjac. Sistema de controle de pacientes com tuberculose TB-WEB. São Paulo (SP): 2016 [cited 2016 Out 27]. Available from: <http://www.cvetb.saude.sp.gov.br/tbweb/index.jsp> (acesso restrito).
 21. Moysés ST, Silveira Filho AD, Moysés SJ. Laboratório de inovações no cuidado das condições crônicas na APS: a implantação do Modelo de Atenção às Condições Crônicas na UBS Alvorada em Curitiba, Paraná. Brasília (DF): Organização Pan-Americana da Saúde, Conselho Nacional de Secretários de Saúde; 2012.
 22. Pinheiro PGOD, Sá LD, Palha PF, Barreto AJR, Rodrigues DCS, Romera AA. Discursividade de

- apoiadores matriciais sobre o controle da tuberculose e o modelo de gestão municipal. *Rev Eletr Enf [Internet]*. 2014 Jul/Sep [cited 2017 Mar 14]; 16(3):502-10, 2014. Available from: <https://www.fen.ufg.br/revista/v16/n3/pdf/v16n3a02.pdf>.
23. Pinafo E, Carvalho BG, Nunes EFPA. Descentralização da gestão: caminho percorrido, nós críticos e perspectivas. *Ciênc Saúde Coletiva [Internet]*. 2016 May [cited 2017 Feb 22]; 21(5):1511-24. Available from: <http://dx.doi.org/10.1590/1413-81232015215.18942015>.
 24. Turci MA, Lima-Costa MF, Macinko J. Influência de fatores estruturais e organizacionais no desempenho da atenção primária à saúde em Belo Horizonte, Minas Gerais, Brasil, na avaliação de gestores e enfermeiros. *Cad Saúde Pública [Internet]*. 2015 Sep [cited 2017 Feb 22]; 31(9):1941-52. Available from: <http://dx.doi.org/10.1590/0102-311X00132114>.
 25. Sa LD, Oliveira AAV, Gomes ALC, Nogueira JA, Villa TCS, Collet N. Caring for tuberculosis patients in the Family Health Strategy: the nurses' perceptions. *Rev Esc Enferm USP [Internet]*. 2012 Apr [cited 2017 Mar 14]; 46(2):356-63. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342012000200013&lng=en&nrm=iso&tlng=en.
 26. Härter J, Andrade RLP, Villa TCS, Arcêncio RA, Russo-Gonçalves E, Cardozo-Gonzales RI. Tuberculosis in primary health care: identifying priority cases in a municipality in southern Brazil. *Acta Scientiarum - Health Sciences [Internet]*. 2015 Jul/Dec [cited 2017 Mar 14]; 37(2):167-74. Available from: http://periodicos.uem.br/ojs/index.php/ActaSciHealthSci/article/view/25232/pdf_86.
 27. Bulgarelli AF, Villa TCS, Pinto IC. Social organization and control of tuberculosis: the experience of a Brazilian town. *Rev Latino-Am Enfermagem [Internet]*. 2013 Sep/Oct [cited 2017 Mar 14]; 21(5):1039-48. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692013000501039.
 28. Scatolin BE, Pinto ESG, Arcêncio RA, Andrade RLP, Wysocki AD, Ponce MAS, et al. Active case finding: community health workers' activity related to tuberculosis control in a large city, Brazil. *Texto Contexto Enferm [Internet]*. 2014 Apr/Jun [cited 2017 Mar 14]; 23(2):261-9. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-07072014000200261
 29. Marquieviz J, Alves IS, Neves EB, Ulbricht L. A Estratégia de Saúde da Família no controle da tuberculose em Curitiba (PR). *Ciênc Saúde Coletiva [Internet]*. 2013 Jan [cited 2017 Feb 22]; 18(1):265-71. Available from: <http://dx.doi.org/10.1590/S1413-81232013000100027>.
 30. Bartholomay P, Pelissari DM, Araujo WN, Yadon ZE, Heldal E. Quality of tuberculosis care at different levels of health care in Brazil in 2013. *Rev Panam Salud Publica*. 2016 Jan [cited 2017 Mar 14]; 39(1):3-11.
 31. Souza KMJ, Figueiredo DA, Villa TCS, Sá LD, Nogueira JA, Palha PF. Tuberculosis treatment drop out and relations of bonding to the family health team. *Rev Esc Enferm USP [Internet]*. 2010 Dec [cited 2010 Mar 14]; 44(4):904-10. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342010000400007&lng=en&nrm=iso&tlng=en
 32. Marcolino ABL, Nogueira JA, Ruffino-Netto A, Moraes RM, Sá, LD, Villa TCS, et al. Avaliação do acesso às ações de controle da tuberculose no contexto das equipes de saúde da família de Bayeux - PB. *Rev Bras Epidemiol [Internet]*. 2009 Jun [cited 2017 Mar 14]; 12(2):144-57. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1415-790X2009000200005
 33. Figueiredo TMRM, Villa TCS, Scatena LM, Cardozo Gonzales RI, Ruffino Netto A, Nogueira JA, et al. Performance of primary healthcare services in tuberculosis control. *Rev Saúde Pública [Internet]*. 2009 [cited 2017 Mar 14]; 43(5):825-31. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-89102009000500011&lng=en&nrm=iso&tlng=en.
 34. Trigueiro JVS, Nogueira JA, Sa LD, Palha PF, Villa TCS, Trigueiro DRSG. Tuberculosis control: decentralization, local planning and management specificities. *Rev Latino-Am Enfermagem [Internet]*. 2011 Nov/Dec [cited 2017 Mar 14]; 19:1289-96. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692011000600003&lng=en&nrm=iso&tlng=en&ORIGINALLANG=en.
 35. Marais, B, Lönnroth, K, Lawn, SD et al, Migliori GB, Mwaba P, Glaziou P, et al. Tuberculosis comorbidity with communicable and non-communicable diseases: integrating health services and control efforts. *Lancet Infect Dis [Internet]*. 2013 Apr [cited 2017 Mar 14]; 13(4):285-7. Available from: [http://dx.doi.org/10.1016/S1473-3099\(13\)70015-X](http://dx.doi.org/10.1016/S1473-3099(13)70015-X).
 36. Curto M, Scatena LM, Andrade RLP, Palha PF, Assis EG, Scatolin BE, et al. Tuberculosis control: patient perception regarding orientation for the community and community participation. *Rev Latino-Am Enfermagem [Internet]*. 2010 Sep/Oct [cited 2017 Mar 14]; 18(5):983-9. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692010000500020
 37. Oliveira SAC, Ruffino-Netto A, Villa TCS, Vendramini SHF, Andrade RLP, Scatena LM. Health services in tuberculosis control: family focus and community orientation. *Rev Latino-Am Enfermagem [Internet]*. 2009 May/Jun [cited 2017 Mar 14]; 17(3):361-7. Available from:

http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692009000300013

38. Magnabosco GT, Lopes LM, Andrade RLP, Brunello MEF, Monroe AA, Villa TCS. Tuberculosis control

in people living with HIV/AIDS. *Rev Latino-Am Enfermagem* [Internet]. 2016 Sep [cited 2017 Feb 22]; 24:e2798. Available from: <http://dx.doi.org/10.1590/1518-8345.1187.2798>.

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