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Does Primary Health Care coverage interfere with the control of Pulmonary Tuberculosis?

A cobertura da Atenção Básica interfere no controle da Tuberculose Pulmonar?

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ABSTRACT
The objective of this study was to assess whether the Primary Health Care coverage, in different models, interfered with the number of reported cases of pulmonary tuberculosis, deaths and cure of the disease, in the state of São Paulo, from 2008 to 2016. This was an ecological study, with secondary data, statistically analyzed by Poisson regression. A higher prevalence of the disease was found in municipalities with a larger population, higher poverty rate and lower coverage of the Family Health Strategy. There were more deaths in municipalities with a larger population, better economic indicators, lower coverage of community health agents and with traditional Primary Health Care. Higher cure rates were observed in municipalities with worse economic and human development indicators, with higher coverage of community health agents and the Primary Health Care. The coverage of Primary Health Care, especially in models composed with community health agents, is associated with better indicators of pulmonary tuberculosis.

Keywords: Community health agent. Family health strategy. Pulmonary tuberculosis. Primary care coverage.

RESUMO
O objetivo deste estudo foi avaliar se a cobertura da Atenção Básica, em seus diferentes modelos de atenção, interferiu no número de casos notificados por tuberculose pulmonar, óbitos e cura da doença, no estado de São Paulo, no período de 2008 a 2016. Estudo do tipo ecológico, com dados secundários, analisados estatisticamente por Regressão de Poisson. Percebeu-se maior prevalência da doença em municípios com maior população, maior taxa de pobreza e menor cobertura de Estratégia de Saúde da Família. Verificou-se mais óbitos em municípios com maior população, melhores indicadores econômicos, menor cobertura de agentes comunitários e que possuem Atenção Básica do tipo tradicional. Maiores taxas de cura foram observadas nos municípios com piores indicadores econômicos e de desenvolvimento humano, com maiores coberturas de agentes comunitários e de Atenção Básica. Conclui-se que a cobertura de Atenção Básica, principalmente nos modelos de atenção que possuem Agentes Comunitários de Saúde, está associada a melhores indicadores de tuberculose pulmonar.

Palavras-chave: Agente comunitário de saúde. Cobertura de atenção básica. Estratégia saúde da família. Tuberculose Pulmonar.

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INTRODUCTION

Tuberculosis (TB) is an infectious, preventable and curable disease, which stands out as a serious problem for public health worldwide[1,2]. It can affect several organs, but the most common and most worrying form of the disease from a public health point of view is in the lungs, as people who do not receive adequate treatment remain bacilliferous and sustain the disease transmission cycle through the airways[1].

In Brazil, access to TB diagnosis and treatment is provided for in the Unified Health System (SUS), especially in Primary Health Care (PHC)[3]. SUS is internationally recognized for its importance and universal access, but challenges remain. Different realities, in a country of continental dimensions, result in different forms of organization of care models[4].

Models of care require different forms of organization of health services, articulating the relationships between the population and the different types of interventions necessary for health production, including the approach to TB. The Basic Primary Care Policy (PNAB) of 2006 recognized some models of care, including the Family Health Strategy (FHS), the Community Health Agents Program (PACS) and the traditional Primary Health Care model (TPHC) [6], which are objects of this study.

TPHC is based on an individual perspective, focusing on the user who seeks health services, in a more passive logic, of accepting demands. The FHS, the most recent model of PHC in Brazil, seeks to value a family and community focus, aiming to act actively, anticipating the search for health services by people and families, carrying out health surveillance, prevention and promotion actions with the enrolled population, extrapolating the physical limits of health units[7].

In turn, PACS began in the late 1980s, as an initiative in some areas of the Northeast, the Federal District and the state of São Paulo. Officially implemented by the Ministry of Health in 1991, it emerged from the need to improve the population's living conditions through the selection and training of people who live in the community, enabling them to act as a link between health units and the population. These Community Health Agents (CHA) play a key role as an integrator of the PHC team and have prominent roles in improving the population health indicators[6,7].

Currently, different models of care (FHS, TPHC, PACS) coexist, which results in different proportions of coverage of PHC as a whole, in the national territory. PHC coverage can be understood as the number of people linked to each health team, but this does not mean that this number of people actually makes use of the services,

that is, coverage cannot be confused with access or use of services[7]. The proportion of FHS coverage, for example, is related, among other factors, to changes in the direction of government policies, which, at certain times, prioritized this model of care[6].

The treatment of users affected by pulmonary TB is provided by the SUS, especially through PHC, although there are municipalities providing such assistance within the scope of specialized care, that is, beyond PHC, and there is a discussion about the effects of the model of care on adherence to treatment, a frequent problem in fighting the disease[3].

Brazil is one of the 30 countries highlighted by the World Health Organization (WHO) as a priority focus for fighting the disease. Although it is possible to state that at least 85% people affected by TB could be successfully treated with a 6-month drug regimen, operationalization depends on access and is probably influenced by different models of care[8], since, ultimately, these require different ways of treating the disease.

Thus, the scarcity of studies with an ecological design relating the coverage of PHC to pulmonary TB and that involve all municipalities in the state of São Paulo over a long period, justifies the present research, insofar as it proposes to expand the understanding of the impact of PHC coverage on the control of this disease, favoring planning and management actions in the face of this persistent and relevant problem from the public health point of view. This study aimed to assess whether PHC coverage, in its different care models, interferes with the number of reported cases of pulmonary tuberculosis, cure and deaths from the disease, in the state of São Paulo, from 2008 to 2016.

METHODS

Ecological study comprising data from all municipalities in the state of São Paulo (645 representative units in the period), from 2008 to 2016, which had data on pulmonary TB notifications, cure and deaths from the disease (excluding other forms of presentation and causes of death).

The outcome variables were the rate of pulmonary tuberculosis/10,000 inhabitants, percentage of deaths from pulmonary TB and percentage of cure of the disease, obtained through the public domain tabulator, available on the website of the Department of Informatics of SUS (DATASUS)[9].

The independent variables were TPHC coverage, FHS coverage and coverage of CHA and come from the Primary Health Care Information and Management System (e-Gestor)[10], considering the month of December of each year of the period studied as a reference. Finally, the adjustment variables were population size, gross domestic product per capita (GDP) and Municipal Human

Development Index (M-HDI), obtained through the databases of Foundation SEADE/SP[11], Atlas Brasil[12] and Brazilian Institute of Geography and Statistics (IBGE)[13].

With the exception of the M-HDI and extreme poverty variables, whose data come from the year 2010 (the only census in the study period, by the Brazilian Institute of Geography and Statistics - IBGE)[13], the others refer to each year of the study period.

To calculate the population covered by TPHC, the Ministry of Health uses the parameter of 3,000 users per team. For FHS, the coverage calculation is based on 3,450 registered users per team. For the CHA, the calculation of coverage is 750 users for each community health agent[6]. As for population size, e-Gestor[10] uses population estimates from the IBGE[13], with reference to the date of July 1 of each year.

All variables were dichotomized into the categories above, below or equal to the median: rate of pulmonary tuberculosis/10,000 inhabitants (≤1.68 and >1.68), percentage of cure of the disease (>87.5%), percentage of deaths by pulmonary TB (>0%); TPHC coverage (≤84.96% and >84.96%), FHS coverage (≤63.58% and >63.58%) and CHA coverage (≤74.25% and >74.25%); population size (≤12,909.00 and >12,909.00), gross domestic product per capita (GDP) (≤18,266.79 and >18,266.79), percentage of extreme poverty (≤1.07 and >1.07) and Municipal Human Development Index (M-HDI) (≤0.74 and >0.74).

Descriptive analysis of the data (frequencies, percentages, medians, minimum value, maximum value and interquartile range) were performed. Then, they were fit, in Poisson regression models, for each adjustment variable (socioeconomic: percentage of extremely poor, per capita GDP, M-HDI and population) and independent (FHS coverage, CHA and TPHC), individually, considering the number of tuberculosis cases/10,000 inhabitants and percentages of cure and death as outcomes.

In the models, data from the years within the municipalities were considered as repeated measures in time. From these models, prevalence ratios and 95% confidence intervals (95%CI) were estimated.

Variables with $p<0.20$ in the individual analyses were studied in the hierarchical Poisson multiple regression models, with those with $p\leq0.05$ remaining in the models.

From the multiple models, adjusted prevalence ratios and 95% confidence intervals (95% CI) were estimated. Initially, the socioeconomic variables were adjusted to each other and, then, the variables of coverage of FHS, CHA and TPHC were adjusted to each other and to the socioeconomic variables. The analyses were performed using the SAS[14] and R[15] softwares. The fit of the models was

analyzed by the QIC (quasi-likelihood under the independence model criterion) according to Cui and Qian[16].

This study was approved by the Research Ethics Committee of Piracicaba Dental School (FOP-Unicamp), and exempted from informed consent, as it is a study and data with public access (letter 12/2019).

RESULTS

In table, between 2009 and 2015, there was a growth in the number of cases, from 14,300 (2009) to 17,085 (2015). The number of cases per 10,000 inhabitants ranged from 3.49 in 2009 to 3.88 in 2015. The percentage of cities with notification ranged from 70.5% (2008 and 2011) to 73.5% in 2013. The percentage of cities with deaths from pulmonary TB in the state ranged from 16.9% in 2014 to 20.0% in 2015. The percentage of cure among cases ranged from 76.3% (2009) to 79.4% (2012) and the percentage of deaths among cases ranged from 2.9% in 2008, 2009 and 2011 to 3.4% in 2013.

Table 1. Population, notification, cure and deaths from pulmonary tuberculosis in the state of São Paulo, from 2008 to 2016

*Year	Population	Number of notified cases	Number of reported cases per 10,000 inhabitants	Number of cure cases	Number of death cases	Number (%) of cities with notifications	Number (%) of cities with deaths	&% cure	¨% deaths
2008	39,827,690	14,727	3.70	11,357	434	455 (70.5%)	119 (18.4%)	77.1	2.9
2009	41,011,635	14,300	3.49	10,904	409	461 (71.5%)	118 (18.3%)	76.3	2.9
2010	41,384,039	14,735	3.56	11,515	438	470 (72.9%)	113 (17.5%)	78.1	3.0
2011	41,262,199	15,452	3.74	12,190	453	455 (70.5%)	115 (17.8%)	78.9	2.9
2012	41,586,892	14,992	3.60	11,906	462	464 (71.9%)	127 (19.7%)	79.4	3.1
2013	41,901,219	16,080	3.84	12,642	541	475 (73.5%)	123 (19.1%)	78.6	3.4
2014	43,663,669	16,175	3.70	12,410	504	466 (72.2%)	109 (16.9%)	76.7	3.1
2015	44,035,304	17,085	3.88	13,196	562	468 (72.6%)	129 (20.0%)	77.2	3.3
2016	44,396,484	16,879	3.80	13,204	554	462 (71.6%)	117 (18.1%)	78.2	3.3

* Between 2008 and 2016. &Percentage of cure among cases. ¨Percentage of deaths from pulmonary TB among cases

In the analysis of individual associations, the percentage of cities with the highest rates of pulmonary TB per 10,000 (above the median) was higher among the cities with the highest percentage of extremely poor, with higher M-HDI, higher population and lower FHS, CHA and TPHC coverage ($p<0.05$) (Table

2). When the variables were studied together, the percentage of extremely poor (PR=1.06; 95%CI: 1.03-1.09), population size (PR=1.17; 95%CI: 1.04-1.21) and FHS coverage (PR=1.04; 95%CI: 1-1.06). Therefore, it can be seen that municipalities with a higher percentage of extremely poor, larger population and with lower FHS coverage had a higher prevalence of pulmonary TB ($p<0.05$) (Figure 1).

Table 2. Crude and adjusted analysis of associations between the rate of pulmonary tuberculosis/10,000 inhabitants in the state of São Paulo, from 2008 to 2016, and coverage of FHS, CHA and TPHC, adjusted for socioeconomic variables

Variable	Category	Rate/10,000 inhabitants >1.68* (%)	$^{\$}$Crude PR ($^{\#}$95% CI)	p-value	$^{\$}$Adjusted PR ($^{\#}$95% CI)	p-value
Block 1						
Year		-	0.99 (0.99-1.00)	0.4267	-	-
Extremely poor	≤1.07*	46.7%	Ref		Ref	
	>1.07	53.3%	1.05 (1.01-1.08)	0.0060	1.06 (1.03-1.09)	0.0002
GDP	≤18,266.79*	47.1%	Ref		-	-
	>18,266.79	52.9%	1.02 (1.00-1.04)	0.0799		
M-HDI	≤0.74*	46.4%	Ref		-	-
	>0.74	53.6%	1.06 (1.02-1.09)	0.0012		
Population	≤12,909.00*	36.2%	Ref		Ref	
	>12,909.00	63.7%	1.19 (1.15-1.22)	<0.0001	1.17 (1.14-1.21)	<0.0001
Block 2						
FHS coverage	≤63.58%*	57.8%	1.07 (1.04-1.10)	<0.0001	1.04 (1.01-1.06)	0.0019
	>63.58%	42.2%	Ref		Ref	
CHA coverage	≤74.25%*	57.5%	1.06 (1.03-1.08)	<0.0001	-	-
	>74.25%	42.5%	Ref			
TPHC coverage	≤84.96%*	58.6%	1.04 (1.02-1.06)	0.0009	-	-
	>84.96%	41.4%	Ref			

*Median. $^{\$}$Prevalence ratio. $^{\#}$Confidence interval. GDP: Gross Domestic Product; M-HDI: Municipal Human Development Index; FHS: Family Health Strategy; CHA: Community Health Agents; TPHC: Traditional Primary Health Care.

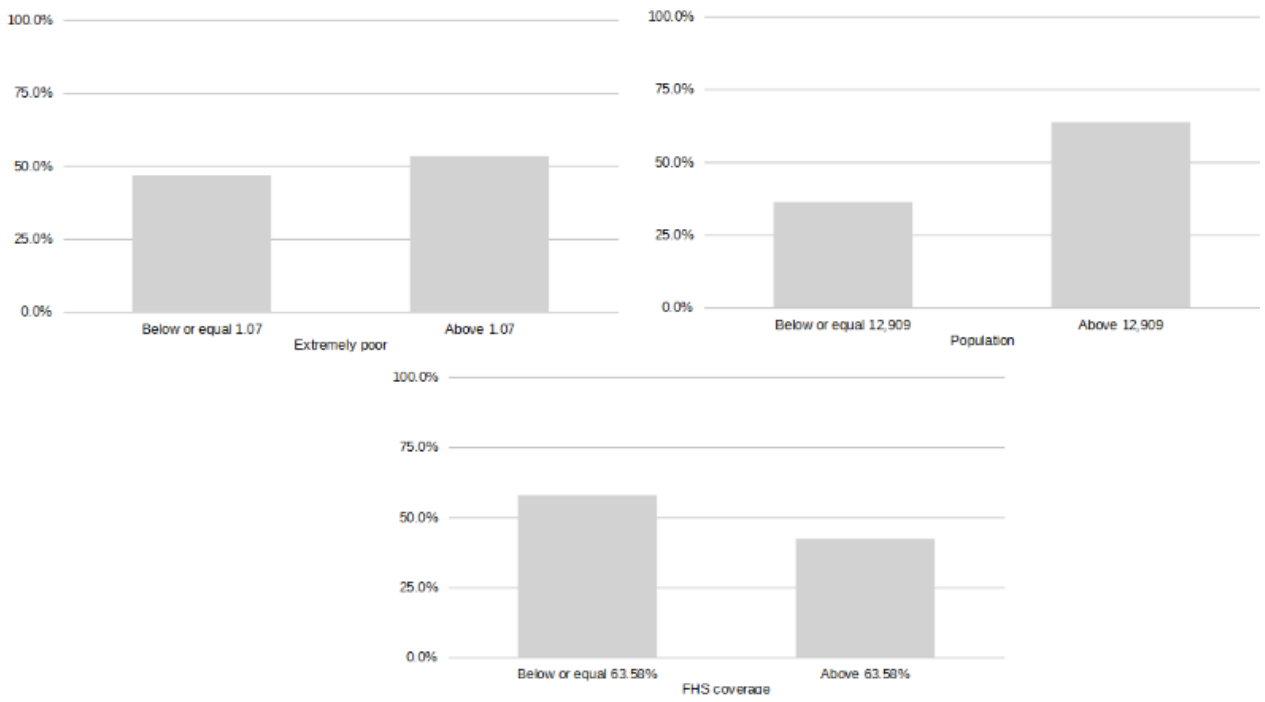

Figure 1. Percentage of cities with a rate of pulmonary tuberculosis/10,000 inhabitants above the median (>1.68) as a function of the percentage of extremely poor, population and FHS (Family Health Strategy) coverage.

Table 3 lists the result for the percentage of cure among the municipalities with notification of pulmonary TB. According to individual analyses, municipalities with lower GDP, lower M-HDI, smaller population, higher coverage of FHS, CHA and TPHC ($p<0.05$) had a higher percentage of cure. After adjustments, the GDP (PR=1.05; 95% CI: 1.02-1.07), M-HDI (PR=1.08; 95% CI: 1.05-1.11), coverage of CHA (PR=1.05; 95% CI: 1.01-1.09) and TPHC (PR=1.06; 95% CI: 1.02-1.09) were retained in the final model Thus, municipalities with lower GDP, lower M-HDI and higher coverage of CHA and TPHC ($p<0.05$) had a higher percentage of cure for pulmonary TB.

Table 4 lists the associations between coverage and the percentage of deaths from pulmonary TB in the municipalities in the state of São Paulo, from 2008 to 2016. A higher percentage of municipalities with deaths was found among those with lower coverage of CHA (PR=1.07; 95% CI: 1.04-1.11) and TPHC (PR=1.05; 95% CI: 1.02-1.08), higher GDP (PR=1.06; 95% CI: 1.03- 1.09) and larger population (PR=1.17; 95% CI: 1.14-1.20).

Table 3. Crude and adjusted analysis of associations between the percentage of cure of pulmonary tuberculosis in the state of São Paulo, from 2008 to 2016, and coverage of FHS, CHA and TPHC, adjusted for socioeconomic variables

Variable	Category	Cure (%) >87.5%* (%)	$ Crude PR (#95% CI)	p-value	$Adjusted PR (#95% CI)	p-value
Block 1						
Year		-	1.00 (1.00-1.01)	0.4052	-	-
Extremely poor	≤1.07*	46.8%	0.97 (0.94-1.00)	0.0643	-	-
	>1.07	51.2%	Ref			
GDP	≤18,266.79*	56.3%	1.08 (1.05-1.11)	<0.0001	1.05 (1.02-1.07)	0.0006
	>18,266.79	42.5%	Ref		Ref	
M-HDI	≤0.74*	58.4%	1.13 (1.09-1.16)	<0.0001	1.08 (1.05-1.11)	<0.0001
	>0.74	40.9%	Ref		Ref	
Population	≤12,909.00*	68.4%	1.21 (1.18-1.25)	<0.0001	-	-
	>12,909.00	39.1%	Ref			
Block 2						
FHS coverage	≤63.58%*	42.0%	Ref		-	-
	>63.58%	58.7%	1.11 (1.08-1.14)	<0.0001		
CHA coverage	≤74.25%*	41.2%	Ref		Ref	
	>74.25%	60.0%	1.12 (1.09-1.15)	<0.0001	1.05 (1.01-1.09)	0.0164
TPHC coverage	≤84.96%*	41.4%	Ref		Ref	
	>84.96%	59.9%	1.11 (1.09-1.14)	<0.0001	1.06 (1.02-1.09)	0.0008

*Median. $Prevalence ratio. #Confidence interval. GDP: Gross Domestic Product; M-HDI: Municipal Human Development Index; FHS: Family Health Strategy; CHA: Community Health Agents; TPHC: Traditional Primary Health Care.

Table 4. Crude and adjusted analysis of associations between the percentage of deaths from pulmonary tuberculosis in the state of São Paulo, from 2008 to 2016, and coverage of FHS, CHA and TPHC, adjusted for socioeconomic variables

Variable	Category	Deaths (%) >0%* (%)	$Crude PR (#95% CI)	p-value	$Adjusted PR (#95% CI)	*p-value*
Block 1						
Year			1.00 (1.00-1.00)	0.9330	-	-
Extremely poor	≤1.07*	26.2%	Ref		-	-
	>1.07	25.0%	1.01 (0.97-1.05)	0.6519		
GDP	≤18,266.79*	17.4%	Ref		Ref	
	>18,266.79	32.8%	1.10 (1.07-1.14)	<0.0001	1.06 (1.03-1.09)	<0.0001
M-HDI	≤0.74*	14.5%	Ref		-	-
	>0.74	35.0%	1.19 (1.15-1.23)	<0.0001		
Population	≤12,909.00*	7.7%	Ref		Ref	
	>12,909.00	34.6%	1.25 (1.21-1.28)	<0.0001	1.17 (1.14-1.20)	<0.0001
Block 2						
FHS coverage	≤63.58%*	34.2%	1.16 (1.12-1.20)	<0.0001	-	-
	>63.58%	13.5%	Ref			
CHA coverage	≤74.25%*	34.7%	1.17 (1.14-1.21)	<0.0001	1.07 (1.04-1.11)	<0.0001
	>74.25%	12.6%	Ref		Ref	
TPHC coverage	≤84.96%*	34.3%	1.15 (1.11-1.18)	<0.0001	1.05 (1.02-1.08)	0.0012
	>84.96%	13.0%	Ref		Ref	

*Median. $Prevalence ratio. #Confidence interval. GDP: Gross Domestic Product; MHDI: Municipal Human Development Index; FHS: Family Health Strategy; CHA: Community Health Agents; TPHC: Traditional Primary Health Care.

DISCUSSION

The study showed that, over the time analyzed, the rate and percentage of cure and deaths from pulmonary TB in the state of São Paulo remained stable.

In Brazil, the elaboration of the National Tuberculosis Control Plan, as a subsidiary tool to improve the disease indicators in Brazilian municipalities, took place only in 2017. In the state of São Paulo, the Tuberculosis Elimination Plan was only implemented in 2018. This plan, developed for the period 2018-2021, has three major pillars: prevention and integrated care centered on people with tuberculosis, bold policies and support systems, and finally, the intensification of research and innovation[17].

Thus, these results may represent stagnation of public policy actions towards the control of the disease, which highlights the need to sensitize the different levels of management, with a view to producing better indicators of cure and deaths related to pulmonary TB.

Thus, there is no way to relate the national and state plans for fighting TB to the results of this study, since they were implemented after the analyzed period and late to the WHO World Health Assembly in 2014, which can lead to a delay in actions and achievement of disease elimination goals by the year 2035[8].

Regarding the rate of pulmonary TB, there was a higher percentage of cities with a higher proportion of the disease (>1.68/10,000 inhabitants) among those with a higher percentage of extremely poor (>1.07%), larger population (>12,909) and lower coverage of FHS (≤63.58). Another study corroborates these results, by showing that TB and poverty are correlated[18]. Poverty usually accompanies precarious health conditions, in a health determinants loop. In addition, disorderly population growth and the concentration of people in the periphery can also worsen TB indicators[18].

Regarding FHS coverage, the presence of these teams in health services potentially improved the detection of TB cases, although there was also evidence that their coverage was inversely associated with the TB detection rate, suggesting that the time of implementation of the FHS may influence the identification of new cases of the disease[19, 20].

There was a higher percentage of users cured from pulmonary TB (>87.5%) in cities with lower GDP (≤18,266.79), M-HDI (≤0.74), higher coverage of CHA (>74.25%) and TPHC (>84.96%). These results are in line with the emphasis of the WHO Commission on Social Determinants of Health, which reinforces that TB is related to social and economic development, but patient care can influence these indicators[21]. Thus, one can interpret the importance of strengthening PHC, with regard to the organizational arrangement of services, taking into account not only the

parameters of the population covered by TPHC and CHA teams, but the way these teams carry out care actions.

In view of this result, the importance of the role of the CHA in the control of pulmonary TB was also evident. In the scope of assistance, it performs actions of active search for users and performs directly observed treatment (DOT), a strategy that consists of observing and monitoring the intake of TB medication by users, avoiding failures and encouraging adherence to treatment[22]. It is necessary to highlight the role of the health teams in which the CHA are inserted, given that this professional works in an integrated manner with the other health professionals linked to their team.

Also correlating TB cure with PHC coverage, a study carried out in the city of Rio de Janeiro concluded that it was not possible to associate better TB cure results in places with higher FHS coverage, when compared to areas not covered by FHS[23].

Analyzing the cure of pulmonary TB, we can interpret that municipalities with an unfavorable socioeconomic scenario take advantage from adequate FHS coverage, achieving success in the treatment of the disease and, apparently, relativizing the socioeconomic determinants. In the analyzed scenario, the control of pulmonary TB would possibly take advantage from a multisectoral view of municipal administrations, which should raise awareness and make other sectors responsible, in addition to health, especially those linked to social and economic development.

A higher percentage of patients with death from pulmonary TB was observed in cities with lower coverage of CHA (≤74.25%) and TPHC (≤84.96%), in order to corroborate the relevance of PHC coverage and performance of CHA in disease control. As the professional responsible for the cooperation between the health team and the community, the CHA develops actions aimed at the promotion, protection and recovery of health, stimulating individual and collective self-care[24].

In TB control, a study in Bangladesh showed the importance of CHA in improving disease indicators, where a non-governmental organization started an experimental tuberculosis control program and successfully achieved high rates of case detection and adherence to treatment, with a cure rate of at least 85% and an abandonment rate of 3.1%[25].

The relationship between the coverage of CHA and deaths from tuberculosis also indicates the need to ensure an adequate proportion of these professionals per inhabitants, so as not to overload the team, and to invest in permanent education, providing better conditions for the sustainable improvement of the indicators of TB[26].

In this context, other countries recognize the CHA as an important

professional in the improvement of health indicators and, in Brazil, this is considered a key element of health actions, a fact that demonstrates the need for permanent education, in order to implement them for the good performance of their attributions with the FHS and the community, maintaining the quality of the work process and health indicators[27].

A fact to be considered is that PHC coverage is susceptible to government policies, which at certain times induce the expansion of the FHS and CHA and, at other times, point to the opposite side, such as, for example, when funding health teams in PHC without the presence of CHA in its composition, which occurred in the last review of the PNAB, in 2017. In addition to changes in the financing and format of the types of coverage of PHC, the attributions of the CHA were modified[28].

A recent study showed that, in the period from 2007 to 2019, there was a growth in the FHS, CHA and TPHC teams in Brazil, but, after the approval of the new PNAB, in 2017, there was a significant reduction in CHA, since this allows the reduction of its proportion in the teams[29].

As for pulmonary TB control, in addition to PHC coverage, there are several factors and details to be considered when analyzing relationships, especially in the micro context, where the actions of health teams and care flows are distinguished, giving unique characteristics to the care of users in each situation and context. Based on the results presented, the work of PHC teams, especially those with CHA in their composition, minimizes the social determinations that challenge TB control in the municipalities. Thus, by the effects of PHC coverage on TB control, it is inferred that municipalities that provide access and bond with users, perform better disease control in PHC, and present better results in disease control.

Therefore, our results corroborate the importance of the role of PHC and health promotion in the control of pulmonary TB, as PHC is the main instance of disease care and it is commonly this organizational axis that articulates intersectoral actions for discussions in health. On the other hand, health promotion, by directly dealing with the confrontation of social determinants, could contribute to the control of pulmonary TB, given that, although health services still face challenges in managing intersectoral actions, it is through this policy that management is mobilized to discuss strategies for coping with these social determinants[30].

An important point to consider is that the format used in Brazil to calculate PHC coverage is prone to errors due to the possibility of duplicate registrations, as well as underreporting of disease events[29, 31]. Thus, this study has inherent limitations in its use of secondary data, although health information systems have improved and are more reliable in recent years, at the same

time that it includes a large volume of data, which increases its validity[31].

CONCLUSION

The study allowed to understand that the coverage and performance of PHC teams, especially in models care that have CHA working in their territories, positively influence indicators of cure and lower death rates from pulmonary TB. Therefore, in addition to PHC coverage, the work process of these teams can contribute to the control of the disease. It was also observed the importance of strengthening PHC and intersectoral actions, as well as the role of health promotion for the proper confrontation of social determinants.

Thus, it is expected that this study can support health managers to strengthen PHC for better results in the control of pulmonary TB, in addition to encouraging PHC teams, in their different models of care, to review their work processes in controlling the disease, as well as to launch the use of health promotion to trigger intersectoral discussions that are so necessary to face pulmonary TB.

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