Original Article

Tuberculosis: income inequality and interaction of the Family Health Strategy and the *Bolsa Família* Program

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ABSTRACT

This study aimed to verify tuberculosis (TB) incidence and mortality behavior in areas covered by the Family Health Strategy and *Bolsa Família* Program, with or with no income inequality. This is an ecological study of the 26 Brazilian federal states and the Federal District. We used univariate, multivariate and spatial analyzes. We calculated the univariate analysis, the measure of position (median) and the measure of dispersion (amplitude) of the variables. In the multivariate analysis, seven groups were identified through hierarchical grouping analysis. The thematic maps construction showed a heterogeneous distribution between the groups due to the specific characteristics. The study evidenced the epidemiological TB reality in Brazil and its behavior in areas covered by the Family Health Strategy and *Bolsa Família* Program. No differences were observed in incidence and mortality when coverage of these programs was satisfactory, which evidences the disease relation to other determinants.

Descriptors: Income; Government Programs; Family Health Strategy; Tuberculosis.

INTRODUCTION

Known as one of the oldest infectious diseases in the world, tuberculosis (TB) remains a public health problem, worsened by poverty, social exclusion, poor income distribution, broad geographical dispersion, HIV epidemics and multidrug resistance[1].

Brazil is one of the 30 high-burden countries prioritized by the

World Health Organization (WHO) and ranks 20th in absolute numbers, with 41 cases per 100,000 inhabitants and a mortality rate of 2.7 deaths per 100,000 inhabitants[2].

WHO recently launched the End TB, to eliminate TB by 2050 (<1 case per 100,000 population) and reduce mortality by 95% by 2035. To this end, three pillars have been suggested, which are universal and integrated health systems (Pillar 1), social protection (Pillar 2) and reinforcement of research (Pillar 3) to guide policies and control actions. In terms of national strategies that approximate these premises, we have the Family Health Strategy (FHS), whose philosophy is to expand access to health services, being strategically located in the territories, and the *Bolsa Família* Program (BFP), which is a mechanism of social protection[2].

Although some studies have shown the impact of both strategies on reducing infant mortality[3], few studies have shown this impact in reducing incidence and mortality in the TB case. A study carried out in the city of Curitiba showed that the increase in FHS coverage had a positive effect on the reduction of new cases and the mortality rate related to TB[4]. Authors[5] corroborate that the *Bolsa Família* Program has been able to increase the adherence and cure rate of TB patients.

In addition, another study[6] found a decline in TB incidence in countries that had a higher Human Development Index (HDI), lower infant mortality and improved sanitation. Other studies suggest that estimates of TB incidence associate with socioeconomic changes and the population's general health status[7].

Economic measures adopted in Brazil in recent years considering the current crisis have constantly threatened the FHS and the BFP, which makes it urgent to highlight how much they have contributed to the improvement of the TB epidemiological indicators. Through a review in the literature, there were no studies that showed the behavior of the main epidemiological indicators of TB with these strategies. Thus, given the goals of eliminating TB and the FHS and BFP potential to promote better social and health conditions, we proposed to verify the TB incidence and mortality behavior in areas covered by the Family Health Strategy and *Bolsa Família* Program, with or without income inequality.

MATERIALS AND METHODS

Nature of the study

This is an ecological study with 26 federal states and the Federal District of Brazil.

Source of information and data collection

Data were collected in November 2014 with the public domain information systems of the Department of Informatics of the Brazilian Unified Health System (DATASUS) and the Brazilian Institute of Geography and Statistics (IBGE).

Selection of variables

Chart 1 shows the variables considered for the study. Initially we collected the incidence and mortality rates for TB of 2012, the FHS and BFP coverage data of 2012, and finally, the Gini index of 2003. These years correspond to those available through the information systems during the collection period. In addition, these variables are classic indicators of the contexts of disease, health services and social/living conditions.

Chart 1: Variables used in the study.

Indicators/Variables	Formula	Operational definitions	Scores	Year	Source
Incidence of tuberculosis	$IC = \frac{\text{nº de casos detectados determ.período de tempo}}{\text{total de indíviduos em risco no inicio do período}}$	It refers to new cases occurring in a population of at-risk individuals over a given period.	High Moderate Low	2012	Strategic Management Support Room (SAGE)
Mortality due to respiratory tuberculosis	$TMTB = \frac{Dob}{(Pi \times 4)} \times 100{,}000$	Respiratory tuberculosis with or without histological/bacteriological confirmation (ICD 10: A15.0 – A16.9)	High Moderate Low	2012	Strategic Management Support Room (SAGE)
Gini index	$G = \frac{\alpha}{0{,}5} = 2\alpha$	It is used to measure inequality of income distribution and consists of between 0 and 1, in which 0 corresponds to full income equality and 1 to full inequality	High Low	2003	Brazilian Institute of Geography and Statistics (IBGE)
Population coverage of the Family Health Strategy (FHS)	$CPESF = \frac{N.ESF \times 3{,}450}{Pi} \times 100$	It consists of a health care model based on the actions of territorialization, intersectoriality, decentralization, co-responsibility and equity.	High Mean Low	2012	Basic Attention Information System (SIAB)
Population Coverage of the *Bolsa Família* Program (BFP)	$PBF = \frac{N.BBF}{Pi} \times 100$	Direct income transfer program for poor and extremely poor families. It consists of several types of benefits transferred monthly to the assisted population.	High Mean Low	2012	Secretariat for Evaluation and Information Management (SAGI)

* In formulas: IC: Incidence; TMR: Tuberculosis mortality rate; G: Gini; PCFHS: Population coverage of FHS; N.FHS: Number of people covered by FHS; P: Population; N.BFP Number of Persons Registered in the *Bolsa Família* Program; ICD 10: International Classification of Diseases.

n. de casos detectados determ. período de tempo = IC = N. detected cases occurring over a given time
total de indivíduos em risco no início do período = total of persons at risk in the beginning of the period

TMTB = TMR
CPESF = PCFHS
N.ESF = N.FHS
PBF = BFP
N.BBF = N.BFP

Data analysis

We performed the descriptive analysis by calculating the measure of position (median) and the measure of dispersion (amplitude) of the variables under study using the software Statistica 7.0. Consequently, States were ranked in decreasing order and divided into quartiles, resulting in three levels for TB incidence and mortality rates (high rates, moderate rates and low incidence and mortality rates); at two levels for Gini index (high and low income inequality) and at three levels for the FHS and BFP coverage (high, mean and low FHS and BFP coverage).

We also used a multivariate analysis, which is a statistical method that simultaneously analyzes multiple measures on each observation under investigation. For this, the variables were standardized through the *Z* transformation method, in which the correlation matrix became exactly the same as the covariance matrix[8]. Then, the grouping analysis was performed by hierarchical level with the Euclidean distance processing and the Ward's method. This technique gave rise to the dendogram (Figure 1) and allowed, according to the investigated variables, the junction of "similar" groups. Through the dendrogram it is possible to verify the similarity between the observations considering that the smaller distance between them corresponds to the higher similarity level[8].

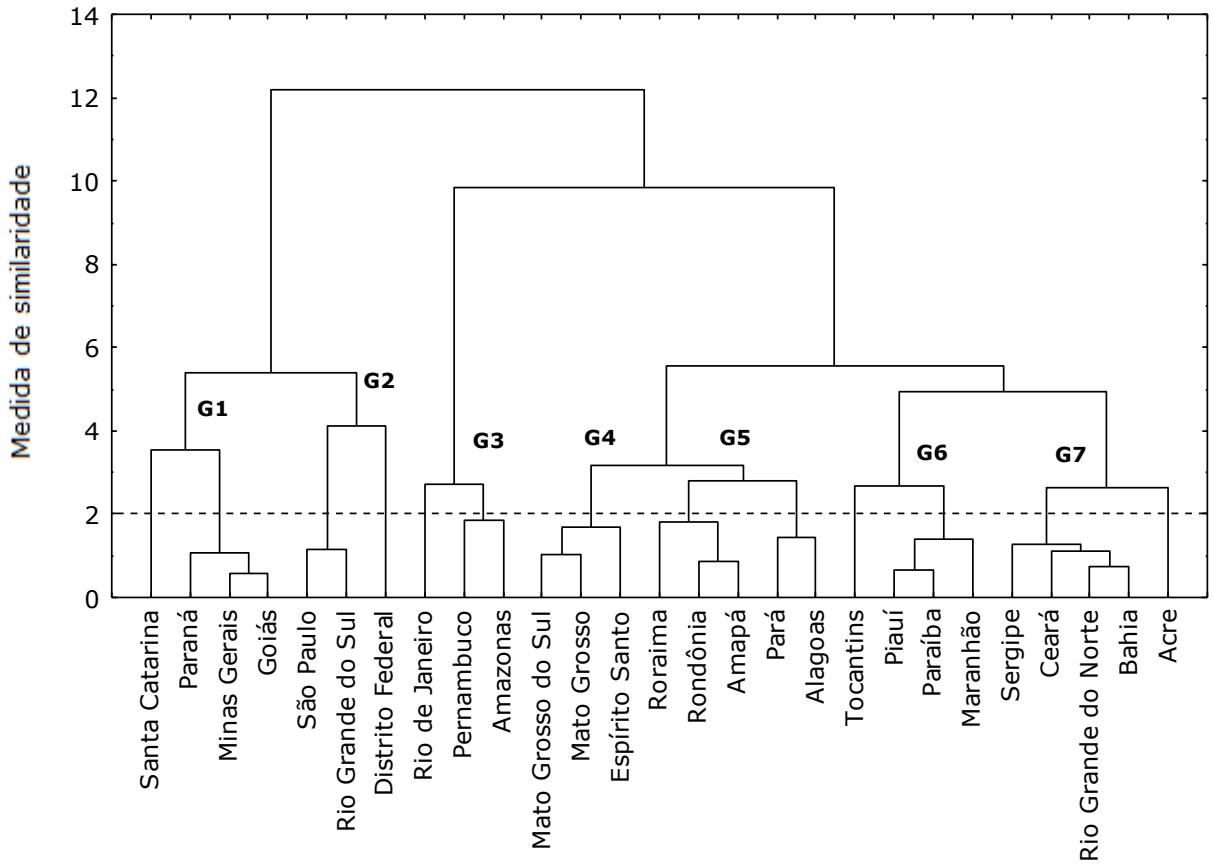

Figure 1: Dendrogram obtained from the application of Grouping Analysis by hierarchical levels, Brazil, (2003-2012).

To facilitate the visualization of the grouped data, thematic maps were constructed using software ArcGis 4.2.2. to verify the spatial distribution of the analyzed variables considering the municipalities' similar characteristics (grouped).

Ethical aspects

Since this study works with secondary data, from the public domain in which no research participant has been identified, it is not necessary to present it to the Research Ethics Committee (CEP), according to National Commission for Research Ethics (CONEP) recommendations.

RESULTS

Figure 1 shows the dendogram resulting from the hierarchical grouping analysis, which consists of a structure containing seven groups. The non-hierarchical (k-means) method, processed with the formation of these groups, allowed us characterize Group 1 with four States (Santa Catarina – SC; Paraná – PR; Minas Gerais – MG and Goiás – GO), Group 2 with three States (Rio Grande do Sul – RS; São Paulo – SP and Federal District – DF), Group 3 with three States (Rio de Janeiro – RJ; Pernambuco – PE and Amazonas – AM), Group 4 with three States (Mato Grosso – MT; Mato Grosso do Sul – MS and Espírito Santo – ES), Group 5 with five states (Pará – PA; Rondônia – RO; Alagoas – AL; Amapá – AP and Roraima – RR), Group 6 with four (Paraíba – PB; Maranhão - MA; Piauí – PI and Tocantins – TO) and Group 7 with five States (Acre – AC; Ceará – CE; Bahia – BA, Rio Grande do Norte – RN and Sergipe – SE).

Table 1 shows data resulting from the descriptive statistics by States and Federal District according to the groups formed in the grouping analysis.

Table 1: Data of the variables according to the Brazilian States and the Federal District, Brazil, (2003-2012).

State or FD	Groups	Rate of tuberculosis incidence	Median	Rate of tuberculosis mortality	Median	Gini index	Median	Family Health Strategy (FHS) coverage	Median	Population Coverage of the *Bolsa Família* Program (BFP)	Median
Santa Catarina (SC)	1	28.40		0.68		0.49		72.50		8.68	
Paraná (PR)	1	20.35	19.25	0.93	1.08	0.47	0.46	61.70	69.85	15.55	17.76
Minas Gerais (MG)	1	18.14		1.37		0.46		74.14		22.30	
Goiás (GO)	1	15.01		1.23		0.45		67.20		19.96	
Rio Grande do Sul (RS)	2	43.35		2.13		0.48		42.94		14.91	
São Paulo (SP)	2	38.57	38.57	1.99	1.99	0.45	0.48	36.85	36.85	10.68	11.50
Federal District (DF)	2	13.44		0.49		0.52		18.43		11.50	
Amazonas (AM)	3	65.72		3.45		0.50		64.39		37.23	
Rio de Janeiro (RJ)	3	65.60	65.60	4.56	4.14	0.50	0.50	49.63	64.39	16.21	37.23
Pernambuco (PE)	3	48.65		4.14		0.50		86.39		42.75	
Mato Grosso (MT)	4	41.66		2.63		0.47		74.91		20.93	
Mato Grosso do Sul (MS)	4	36.12	36.12	2.51	2.51	0.46	0.47	92.75	72.59	20.07	20.16
Espírito Santo (ES)	4	34.57		2.06		0.50		70.26		20.16	
Pará (PA)	5	43.41		2.71		0.44		79.64		39.85	
Rondônia (RO)	5	34.46		1.38		0.46		83.40		26.99	
Alagoas (AL)	5	32.91	32.91	3.03	2.00	0.47	0.45	77.14	79.64	48.57	35.21
Amapá (AP)	5	29.20		2.00		0.45		81.88		30.57	
Roraima (RR)	5	25.77		1.49		0.44		59.24		37.80	
Paraíba (PB)	6	28.96		1.93		0.46		98.16		45.42	
Maranhão (MA)	6	27.71	24.77	2.12	1.87	0.43	0.46	88.88	97.98	51.83	47.86
Piauí (PI)	6	21.83		1.80		0.46		98.81		50.30	
Tocantins (TO)	6	12.97		0.56		0.47		97.80		36.30	
Acre (AC)	7	43.33		1.05		0.53		97.04		40.64	
Ceará (CE)	7	38.28		2.53		0.51		83.24		46.33	
Bahia (BA)	7	33.77	33.77	2.41	2.07	0.49	0.50	83.50	83.50	43.82	42.87
Rio Grande do Norte (RN)	7	27.75		2.07		0.49		77.42		38.67	
Sergipe (SE)	7	24.30		1.89		0.50		94.44		42.87	

Note: Tuberculosis and Mortality Incidence (cases/100,000 inhabitants)

Chart 2 shows the groups' classification according to the scores of each variable. For the incidence rate and the mortality rate, the most prevalent score was the one with moderate rates, respectively (24.30 – 41.65); (1.30 – 2.51); for the Gini Index the most prevalent score was low index (≤0.47) and for the FHS and BFP coverage the most influential was low coverage, respectively (<59.24); (<19.96).

Chart 2: Classification of groups according to scores, Brazil, 2016.

Groups	Incidence rate	Mortality rate	Gini index	FHS coverage	BFP Coverage
Group 1	Low	Low	Low	Low	Low
Group 2	Moderate	Moderate	High	Low	Low
Group 3	High	High	High	Low	Low
Group 4	Moderate	High	Low	Low	Mean
Group 5	Moderate	Moderate	Low	Mean	Low
Group 6	Low	Low	Low	High	High
Group 7	Moderate	Moderate	High	High	High

Figure 2 shows the distribution of these groups according to Brazilian states and the Federal District. The States belonging to their respective group have a different color.

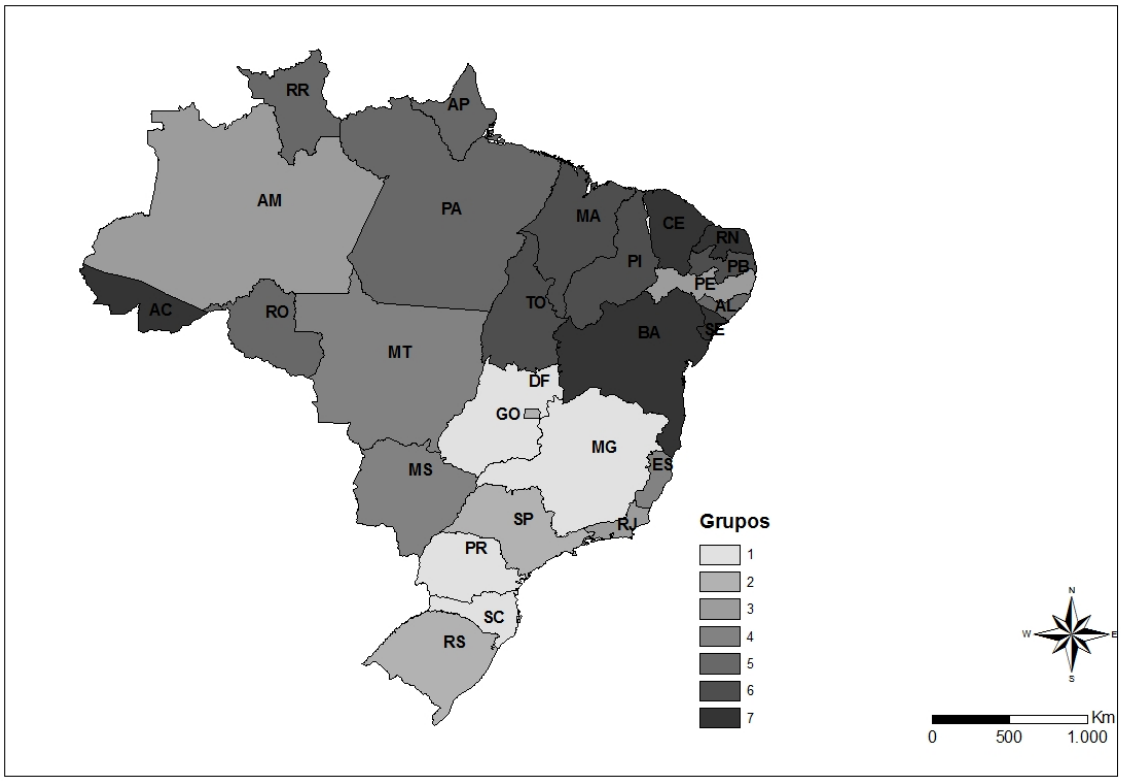

Figure 2: Thematic map of the groups formed by the Brazilian States and the Federal District, Brazil, 2016.

DISCUSSION

This study aimed to verify TB incidence and mortality behavior in areas covered by the Family Health Strategy and *Bolsa Família* Program, with or with no income inequality.

The high TB rates of incidence and mortality occurred in a heterogeneous way between the states and the Brazilian macro-regions. This epidemiological situation occurred both in areas with high or low FHS and BFP coverage, and there may be other issues related to the TB issue other than these strategies.

Although Brazil has a satisfactory detection level of TB cases (above 70%), the problem is to ensure that the patient fulfills his/her treatment (well below the 85% recommended by the WHO) and the late diagnosis[9] which may favor a high mortality rate in some States.

Another situation evidenced in the study were areas with high FHS and PBF coverage and poor results in relation to TB incidence, which may be due to fragilities notably from FHS (Group 6) in case detection, possibly due to underreporting, considering the social situation in these areas and the territorial extension itself.

The study also showed that Group 1 had most States in the South and Southeast, which bring better indicators in terms of income distribution (Gini lower in relation to the others) and low FHS and *Bolsa Família* Program coverage. Although FHS was thought for all persons (Alma-Ata idea), in Brazil, there is an idea of selective Primary Health Care (PHC), thus placing it at poorer regions, similarly to the results of the study[10].

The results also showed a relationship between the level of income distribution and the *Bolsa Família* Program, showing that the North and Northeast States had higher Gini index and, in turn, greater social benefit coverage. This proportion is much lower in the South and Southeastern States, which traditionally had a higher Gross Domestic Product and a better income distribution when compared to other States.

Income inequality is a problem in Brazil, standing out as one of the leading countries in inequality, losing out to countries such as South Africa, Sierra Leone and Lesotho[11], and has a considerable effect on the TB, and if there is interest in its elimination it should be directed to its determinants.

Now, historically, TB is associated with high poverty rates and low socioeconomic development. Its epidemiological paradigm bases on the assumption that the disease is distributed unevenly in the territories and this inequality reflects in life condition. Some authors report that in places with social deprivation, particularly in areas of poor housing, high unemployment and low income, there should be an incentive for actions to search for symptomatic respiratory and early TB diagnosis, as worsening social and economic conditions results in significant degradation of living conditions, increasing the vulnerability and, consequently, the risk of becoming ill[1].

Thus, it is reinforced the need for TB control to encompass the correction of these inequalities considering the impact of socioeconomic conditions on the worsening of the epidemiological situation of the disease. To that end, actions related to health services should be directed toward health promotion and disease prevention, facilitating access to diagnosis and treatment, increasing global and local efforts in the perspective of creating and implementing public policies that act on the risks that contribute for TB illness.

Some authors state that including treatment of health problems such as TB in BFP conditionalities could be a government initiative to reduce the impact of poverty on the health of this population[12]. Especially in relation to TB, this measure could contribute to treatment adherence, mainly because it would complement the patient's diet and help counteract the side effects of the medication and lack of food.

Authors[13] point out that studies focusing on FHS could contribute to health management, problem identification, actions reorientation and new sanitary incorporation practices, such as those related to

strategic PHC areas, among them, the TB control.

The perspective for such programs is that they would serve as a gateway to health services, promoting access to good quality basic care and, above all, disease control. Authors point out that there is an inverse association between access to health services and TB, especially in the incidence and mortality rates for the disease[14], since FHS, due to its characteristics of integrality, opportunity, continuity of care and management of the most prevalent health problems[13], may contribute to avoid or decrease the occurrence of TB as well as its evolution.

However, according to studies, in practice, the process of intersectoriality of social and economic actions and strategies and health care is recent and suffers from numerous procedural weaknesses that make it difficult to care for families. One of the factors hindering this system is the verticalization of government programs, in which hegemony in decision-making weakens the actions carried out at more micro levels of the system[15].

Given these results, a hypothesis arises in relation to the capacity of municipalities in observing and following such situations or determinants, as raised by authors[16]. Therefore, the State sought to provide financial incentives to municipalities that obtained certain levels of BFP management quality. However, these strategies are criticized for the centrality of finance incentive[16].

Another aspect to be addressed refers to the managers or health professionals who are unaware of the arrangements and organization of the BFP, causing the non-viability of full care by social programs. In addition, the professionals' claim about the articulation level of these programs makes it difficult for them to bond with the families assisted, who in turn fear the benefit cut off from the routine visits of the health team[17].

Although the performance of these strategies may have a positive effect, the results are still questionable or small, compromising the design of public policies that have a negative impact on TB morbidity and mortality indicators in the country[17]. On the other hand, the study allowed us to show an epidemiological picture of TB in the country and to reflect on the FHS and BFP coverage and the potential of these strategies in relation to TB elimination. Although very different situations have been presented among the investigated scenarios, it is not possible to conclude whether such strategies contribute to the epidemiological indicators improvement; however, it has pointed to progress in social family conditions, removing many persons of the extreme poverty. FHS, enhanced by BFP, provides a great service to the Brazilian society and, therefore, there must be greater investment as a State policy.

It is also important to highlight the relevance of the study when using the geoecological approach to classify States in relation to the epidemiological indicators of TB. These results can help managers and healthcare professionals in the planning, monitoring and assessing of their actions in health and what is needed to reach the goal of eliminating the disease. In addition, we highlight the importance of this approach in the nurses' role, in being able to collect information and carry out sanitary intervention projects, build maps and discuss them with the various actors in their territory, such as users, healthcare professionals,

managers and students.

In addition, studies that consider spatial analysis can be a very appropriate tool for the evaluation of health systems and services, given that maps can raise awareness among managers and workers, providing situational diagnosis of reality, raising hypotheses related to the problem and understanding its complexity and determinants[18].

Among the study limitations, there is the heterogeneity of health systems in the production of their data, data recording, data coverage, which can vary in time, in regions and potential information losses. Another limitation refers to the fact that the study used the States and not the municipalities as a unit of analysis, the first being very heterogeneous with great diversity in terms of its epidemiological and social indicators and the culture itself, although there is a federal regulation for fulfill these indicators.

Considering the Brazilian territorial dimensions, almost a continent, working its smaller geographic units as census tracts is a great challenge; however, the study advances in knowledge by revealing a situational reality of TB in the country and the behavior of the disease especially through its two main indicators (incidence and mortality) before FHS and BFP, which are two main strategies to be used to eliminate TB.

FINAL CONSIDERATIONS

The results pointed out that, regardless of the FHS and BFP coverage, TB incidence and mortality rates fluctuated, with areas with high FHS and BFP coverage and with high or low case detection. Thus, we cannot infer that areas with greater coverage of these strategies also have better epidemiological indicators, an initial premise of the study. The Southern and Southeastern States had the lowest social inequality (Gini) and low FHS and BFP coverage. The States of the North and Northeast regions showed greater FHS and BFP coverage.

The knowledge about the epidemiological situation in the Brazilian states regarding TB incidence and deaths and its relationship with FHS and BFP and social inequality has led to reflections on the paths to be taken in the country to eliminate TB. The *End TB* strategy suggested two innovative pillars to reach the elimination goal, the first referring to the universality and integration of its systems for TB patient accessibility, a process that is already advancing in Brazil with the 1988 Constitution and by the intensification to the PHC policy through the FHS. Social protection is another pillar, in which the BFP fulfills this role and can therefore help to remove persons from extreme poverty, which is very likely to have a positive impact on TB. However, some aspects were incomplete, perhaps because the dynamics of the disease connects to other variables not seen in the study, such as service routines, population culture, intra-state micropolitics, training of professionals, among others, which should be advanced in future studies.

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REFERENCES

1. San Pedro A, Oliveira RM. Tuberculose e indicadores socioeconômicos: revisão sistemática da literatura. Rev Panam Salud Pública [Internet]. 2013 [cited 2017 sep 4];33(4):294-301. Available from: http://dx.doi.org/10.1590/S1020-49892013000400009.
2. World Health Organization. Global Tuberculosis Report 2015 [Internet]. Geneva: World Health Organization; 2016 [cited 2017 sep 4]. Available from: http://apps.who.int/iris/bitstream/10665/191102/1/9789241565059_eng.pdf.
3. Rasella D, Aquino R, Santos CA, Paes-Sousa R, Barreto ML. Effect of a conditional cash transfer programme on childhood mortality: a nationwide analysis of Brazilian municipalities. Lancet [Internet]. 2013 [cited 2017 sep 4];382(9886):57-64. Available from: http://dx.doi.org/10.1016/S0140-6736(13)60715-1.
4. Santos CRB, Magalhães R. Pobreza e Política Social: a implementação de programas complementares do Programa Bolsa Família. Cien Saude Colet [Internet]. 2012 [cited 2017 sep 4];17(5):1215-24. Available from: http://dx.doi.org/10.1590/S1413-81232012000500015.
5. Torrens AW, Rasella D, Boccia D, Maciel EL, Nery JS, Olson ZD et al. Effectiveness of a conditional cash transfer programme on TB cure rate: a retrospective cohort study in Brazil. Trans R Soc Trop Med Hyg [Internet]. 2016 [cited 2017 sep 4];110(3):199-206. Available from: http://dx.doi.org/10.1093/trstmh/trw011.
6. Arinaminpathy N, Dye C. Health in financial crises: economic recession and tuberculosis in Central and Eastern Europe. J R Soc Interface [Internet]. 2010 [cited 2017 sep 4];7(52):1559-69. Available from: http://dx.doi.org/10.1098/rsif.2010.0072.
7. Oxlade O, Schwartzman K, Behr MA, Benedetti A, Pai M, Heymann J et al. Global tuberculosis trends: a reflection of changes in tuberculosis control or in population health? Int J Tuberc Lung Dis [Internet]. 2009 [cited 2017 sep 4];13(10):1238-46. Available from: http://www.ingentaconnect.com/contentone/iuatld/ijtld/2009/00000013/00000010/art00010.
8. Mingoti SA. Análise de dados através de métodos de estatística multivariada – uma abordagem aplicada. Belo Horizonte: UFMG; 2005. 297 p.
9. Villa TC, Ruffino-Netto A, Scatena LM, Andrade RL, Brunello ME, Nogueira JA et al. Health services performance for TB treatment in Brazil: a cross-sectional study. BMC Health Serv Res [Internet]. 2011 [cited 2017 sep 4];11(1):241. Available from: https://doi.org/10.1186/1472-6963-11-241.
10. Giovanella L. Atenção Primária à Saúde seletiva ou abrangente? Cad Saude Publica [Internet]. 2008 [cited 2017 sep 4];24(suppl 1):s21-3. Available from: http://dx.doi.org/10.1590/S0102-311X2008001300005.
11. OECD. Active with Brazil [Internet]. Paris: OECD; 2015 [cited 2017 sep 4]. Available from: http://www.oecd.org/brazil/Brazil%20brochureWEB.pdf.
12. Pinheiro RS, Oliveira GP, Oliveira EXG, Melo ECP, Coeli CM, Carvalho MS. Determinantes sociais e autorrelato de tuberculose nas regiões metropolitanas conforme a Pesquisa Nacional por Amostra de Domicílios, Brasil. Rev Panam Salud Pública [Internet]. 2013 [cited 2017 sep 4];34(6):446-51. Available from: http://www.scielosp.org/scielo.php?script=sci_arttext&pid=S1020-49892013001200011&lng=en&nrm=iso&tlng=pt.
13. Backes DS, Backes MS, Erdmann AL, Büscher A. O papel profissional do enfermeiro no Sistema Único de Saúde: da saúde comunitária à estratégia de saúde da família. Cien Saude Colet [Internet]. 2012 [cited 2017 sep 4];17(1):223-30. Available from: http://dx.doi.org/10.1590/S1413-81232012000100024.
14. Kronman AC, Ash AS, Freund KM, Hanchate A, Emanuel EJ. Can primary care visits reduce hospital utilization among Medicare beneficiaries at the end of life? J Gen Intern Med [Internet]. 2008 [cited 2017 sep 4];23(9):1330-5. Available from: http://dx.doi.org/10.1007/s11606-008-0638-5.
15. Marques FC, Ribeiro KSMA, Santos WQ. Intersetorialidade: possibilidade de parcerias entre a Estratégia Saúde da Família e a Pastoral da Criança. Saúde em Debate [Internet]. 2012 [cited 2017 sep 4];36(95):544-53. Available from: http://dx.doi.org/10.1590/S0103-11042012000400006.
16. Monteiro DAA, Ferreira MAM, Teixeira KMD. Determinantes da gestão do Programa Bolsa Família: análise do índice de gestão descentralizada em Minas Gerais. Saúde e Soc [Internet]. 2009 [cited 2017 sep 4];18(2):214–26. Available from: http://dx.doi.org/10.1590/S0104-12902009000200005.
17. Integração entre o Bolsa Família e o Programa de Saúde da Família: desafios estratégicos [Internet]. Brasília (DF): UNDP/IPC-IG; c2017 [cited 2017 sep 4]. Available from: http://www.ipcig.org/publication/mds/17P.pdf.
18. Arcêncio RA. Tecnologias em saúde para análise espacial e diagnóstico situacional dos territórios: contribuições para a enfermagem. Rev Bras Enferm [Internet]. 2015 [cited 2017 sep 4];68(6):999-1000. Available from: http://dx.doi.org/10.1590/0034-7167.2015680601i.