RPPI
Revista Brasileira de Políticas Públicas e Internacionais

Parties, elections and health inequalities in Brazilian municipalities: a relational analysis based on political and management factors and dependence on the public system[1]

Partidos, eleições e desigualdades em saúde nos municípios brasileiros: uma análise relacional a partir dos fatores políticos, de gestão e da dependência do sistema público

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DOI: 10.22478/ufpb.2525-5584.2021v6n3.60028

Recebido em: 30/06/2021
Aprovado em: 18/11/2021

Abstract: This work aims to identify how political factors are related to health inequalities from the approach of state capacities, considering that these indicate a necessary condition for a potential reduction of health inequalities. For this, a synthetic indicator of state capacities in health was formulated for the 5,570 Brazilian municipalities from 2013 to 2015, and through descriptive analyzes and econometric regression models of panel data and logistic regression, we sought to answer the following questions: (I) is the dependence of voters on the public health system correlated with the levels of state capacity in health and, consequently, with the levels of inequality?; (II) do left parties reduce health inequalities more in relation to other parties?; and (III) are municipal governments that reduce health inequalities politically rewarded through re-election? The results indicate that (I) higher levels of dependence are correlated with higher levels of state capacity; (II) leftist parties no longer reduce health inequalities; (III) voters reward municipal governments for reducing health inequalities, although there is no unanimous standard in this regard.
Keywords: inequalities; health; state capacity; left; elections.

[1] Este artigo é resultado de uma iniciação científica (Processo Fapesp: 2019/09164-2) desenvolvida no Centro de Estudos da Metrópole (CEM/Cepid – Processo Fapesp: 2013/07616-7) sob orientação do Professor Marcos Paulo de Lucca-Silveira (EESP/FGV), a quem agradeço pelos comentários e sugestões, assim como à Professora Marta Arretche (FFLCH/USP/CEM). Agradeço também aos pareceristas anônimos da Revista Brasileira de Políticas Públicas e Internacionais pela avaliação e sugestões.
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Resumo: Este trabalho objetiva identificar de que forma os fatores políticos se relacionam com as desigualdades em saúde a partir da abordagem das capacidades estatais, considerando que estas indicam uma condição necessária para uma redução potencial das desigualdades em saúde. Para isso foi formulado um indicador sintético de capacidades estatais em saúde para os 5.570 municípios brasileiros de 2013 a 2015, e por meio de análises descritivas e modelos econométricos de regressão de dados em painel e regressão logística se buscou responder às seguintes perguntas: (I) a dependência dos eleitores sobre o sistema público de saúde se correlaciona com os níveis de capacidade estatal em saúde e consequentemente nos níveis de desigualdade?; (II) os partidos de esquerda reduzem mais as desigualdades em saúde em relação aos outros partidos?; e (III) os governos municipais que reduzem as desigualdades em saúde são recompensados politicamente por meio da reeleição? Os resultados indicam que (I) maiores níveis de dependência se correlacionam com maiores níveis de capacidade estatal; (II) os partidos de esquerda não reduzem mais as desigualdades em saúde; (III) os eleitores recompensam os governos municipais pela redução das desigualdades em saúde, embora não haja um padrão unanime em relação a este aspecto.
Palavras-chave: desigualdades; saúde; capacidade estatal; esquerda; eleições

1. Introduction

The constitution of public policies that make Brazilian social welfare state in the recent period refers to the Federal Constitution of 1988, which in its chapter on social rights guaranteed Brazilian society the rights to health, education, housing, study, assistance and others. Although many of these policies already existed up to then, Magna Carta leveraged them, expanding the service list that would come to be guaranteed to society. The landmark held in 1988 denotes a substantial paradigm shift for public policies in the subsequent period, being responsible, for example, for dynamics that result in an increase in individuals' well-being and a reduction in inequalities in many of its dimensions (Arretche, 2015).

Health policy, in particular, is undergoing a deep transformation as it is structured on the principles of universality, gratuity and integrality. Compared to the previous period, the last Federal Constitution now includes in the health system a significant portion of the population that previously did not have access to the system that was restricted and conditioned to an employment relationship, this transition exemplifies the "inclusion of outsiders" process (Arretche, 2018). As health services began to be expanded and individuals began to have greater access to them - so that the availability of income or employment was no longer a determining factor in access to health services - health inequality decreased, reflected in epidemiological and infant mortality scenarios, for example (Arretche, 2018; Coelho & Dias, 2015).

Still within the scope of health policy, another significant change marked in the Federal Constitution was the decentralization process. The federative model established in Brazil in 1988 gave municipalities a central role in the management and implementation of health policy, which are essential for its success. At the same time, health financing was the responsibility of the three federative entities. In summary, all entities finance and municipalities provide (Arretche, 2002). However, for Grin and Abrucio (2018), the transfer of responsibility to the municipalities was not accompanied by a proportional transfer of state capacities, so that this process could compromise the expected results.

So, the understanding of health policy in Brazil, its management and results, as well as the factors linked to its inequalities, requires an understanding of what happens in Brazilian municipalities. In this study, the approach centered on health inequalities takes place from the perspective of state capacities, understood as the state's capacity to implement public policies (Gomide, Pereira & Machado, 2017). It is true that this perspective is not directly and linearly reflected in the results (impacts and effects) of the health policy, since despite the availability of resources being a necessary condition for the success of the policy, it is not necessarily sufficient, given that there is a complexity of other factors that are also determinants of health policy outcomes. A given health program, for example, as Victora et al (2000) demonstrate, may, at a first stage of its implementation, widen inequalities between the most needy and least needy individuals in favor of them, and only in a later period will it reduce inequalities in favor of the poorest. Despite these dynamics, I argue that the increase in state capacities in health creates a potential reduction in health inequalities, in view of the increase in conditions for the policy to be implemented, contemplating in a more equitable manner the target population. Therefore, the reduction of health inequalities will be treated in this study as a potential effect of increasing state capacities in health.

Considering the complexity of political and management factors that involve the consummation of health policy within municipalities, as well as the dynamics of actors, elections, institutions and political parties, which, depending on their ideological orientation, produce different effects on public policies (Esping-Andersen, 1991) or have strict motivations, such as the search for votes, which explains certain types of behavior and public policies (Downs, 1991), and considering the centrality of health policy for social and promoting the individuals' well-being, this article aims to (I) identify whether

the individuals' dependence on the public health system influences the state capacity levels in health in municipalities, so that the increase in state capacity (potential reduction inequality of outcomes) is reflected by these dependency levels; (II) identify whether the party orientation of municipal executive governments influences the levels of state capacity in health; and (III) identify whether governments that improve their state capacity in health, and thus reduce inequality of outcomes, are re-elected, that is, politically rewarded.

After this introduction, this study is structured in another five sections. The first presents an overview of health policy and its relationship with the Federal Constitution of 1988. The second makes a theoretical discussion about the study objectives and hypotheses. The third with the methodology, which presents the construction of state capacity indicators and econometric models. The fourth presents the results and the fifth the result discussion. Then, there are the final considerations and bibliographical references.

2. Health policy, the Federal Constitution of 1988 and state capacities

The understanding of the health model that was constituted in the Federal Constitution of 1988 goes through its trajectory, which refers to a period much earlier than that. Health care in Brazil dates back to the 1930s, which linked this type of care to social security, thus denoting the conservative and conditioning nature of health care. Within the scope of Institutos de Aposentadorias e Pensões (IAPs), formal social security contributors had access to health services, which, due to social security fragmentation - each job category had its own IAP - generated different types of inequalities among workers, as the different categories had different social security structures and different types of assistance (Menecucci, 2007). The constitution of these arrangements gave rise to different types of private health service providers, being promoted from the 1960s, when the public authorities used this apparatus to expand health services and coverage linked, at this time, more deeply to the Social Security, contributing to the expansion of the private sector through the purchase of its services (Menecucci, 2007).

About historical neo-institutionalism, Menecucci (2007) identifies that a set of factors such as rules, norms, choices, contingencies, among others, led to the constitution of a Brazilian health system marked by the public and private mix, so that neither even the creation of one of the largest health systems in the world, SUS, characterized by being

unique, free and universal, managed to ensure a purely public health system in Brazil. On the other hand, according to Arretche (2018), the health system that was formed in the Federal Constitution of 1988 was responsible for including 60% of the population that previously did not have access to health policy due to its conditioning, thus being responsible for the reduction of health inequalities in the period after the Constitution.

Although SUS has meant one of the greatest (if not the greatest) advances in health policy of all times, the dichotomy between the public and private system also represents one of the greatest sources of inequality among individuals in both systems, although one cannot speak of two parallel systems, since, due to its universal nature, SUS does not exclude users from the private system. Thus, the health model that was created in Brazil is made by a public system, which includes the entire Brazilian population (about 200 million people) and a private system, which includes about a quarter of the Brazilian population (50 million people people). In terms of financing, the imbalance of conditions is evident, since, according to Levi (2016), the public system was responsible for 46% of the total expenditure (R$226 billion) on health in 2013, while the private system was responsible for by 54% of expenditures (R$271 billion). According to the same author, countries like Denmark, France, Germany and the United Kingdom have their health systems financed by the public sector in 84%, 79%, 85% and 80%, respectively. This imbalance in conditions evidenced by financing is also reflected in the results of health services, which reveal inequalities created between exclusive users of the public system and users of the private system.

Regarding the health inequalities that have been created, Boccolini and Souza Junior (2016), investigating the factors associated with inequity in the use of health care in Brazil through Pesquisa Nacional de Saúde (PNS) 2013, identify that 15% of people with 18 years or older have not used the health system, and the share of excluded people is greater among young people, men, non-whites, people with no education and those who do not have private health insurance. Econometric models also indicate a high probability of not using the health system among individuals without private health insurance. From the same research, Barros et al (2016, p. 5) identifies that “those without private health insurance have a higher prevalence of smoking, being inactive in their spare time, having a sedentary lifestyle, and consuming more meat with fat and whole milk than those with private health insurance”, thus highlighting the probable inequalities of individual well-being between those with private health insurance and those without private health

insurance. On the other hand, Dourado, Guadalupe and Aquino (2016) found that having a Fonte Usual de Cuidados (FUC) is more common among the population covered by Estratégia Saúde da Família (ESF) program, as well as by people who have private health insurance, chronic diseases or comorbidities. The authors also find that ESF was strongly associated with receiving primary health care, in addition to having a negative relationship with the fact of having private appointments such as a FUC, that is, being attended by ESF reduces the individuals' dependence on the private system.

Thus, it is evident that the hybrid model of the Brazilian health system, which brings the public and the private, is one of the explanatory factors of health inequalities among individuals in favor of those who have a private health plan, which in turn also they tend to have more resources of another order, such as financial resources, which further accentuate inequalities. However, some public policies, such as Estratégia de Saúde da Família program, tend to reduce inequalities among those who do not have a private plan and those who do. Due to the need for resources to promote policies that tend to reduce health inequalities in their multiple dimensions, state health capacities are a necessary condition to reduce health inequalities, since the expansion of the State's capacity for action, creates the conditions for it to promote its health policies and match individuals without a private health plan with those who have a private health plan.

The understanding of state capacities requires the recognition of its complexity and the polysemy of the concept, which includes different dimensions and perspectives of State action, but which in a stricter sense can be understood as its capacity to implement public policies, with all the decisions that permeate this process (Souza, 2020). According to Souza (2020, p.45), "the importance of the concept derives from the pure will of political agents or actors is not enough for goals to be achieved", so that its achievement must precede material and goals.

The conceptual operationalization of state capabilities is commonly divided into two dimensions: the technical-administrative and the political-relational. While the first concerns material and professional factors, the second concerns factors related to interpersonal interactions (Souza, 2020; Gomide, Pereira & Machado, 2017; Grin, Demarco & Abrucio, 2021). In health policy context, according to Oliveira and Coelho (2021), technical-administrative capacities are expressed by: availability of health units and services, availability of human resources, information systems, access to medicines and financing. While political-relational capacities are provided through, for example, the

council of representation of municipalities, such as Conselho Nacional de Secretarias Municipais de Saúde (CONASEMS), and inter-federative forums, such as Comissões Intergetoras Tripartite e Bipartite (CIT e CIBs).

3. Parties, inequality and health

The constitution of welfare states was largely associated with the existence of some social policies, especially those in health and education. However, for Esping-Andersen (1991) this classification criterion for welfare states is vague and does not say much about substantive aspects of these policies. Thus, the author proposes a classification of welfare states based on the decommodification metric, according to which "it occurs when the provision of a service is seen as a matter of law or when a person can support themselves without depending on the market" (Esping-Andersen, 1991, p. 102).

Based on international experiences and the types of policies that were created in different countries, Esping-Andersen (1991) proposes three types of welfare state based on the metric of decommodification. The liberal model is characterized by being the least de-commodifying, as it is primarily intended for the demonstrably poor and in dimensions just sufficient to meet basic needs, being thus also stigmatized and, consequently, discouraging access, thus increasing the dependence of the market individuals. The conservative model is characterized by its high level of fragmentation and conditioning to some type of employment relationship, so that access to the policy is conditional on contributions, as is the case with social security policies in most countries. Finally, the most decommodified model is the social-democratic model, which is characterized by being universal and does not condition access to policies to any contribution, so that individuals can choose to study or not under this model, once the dependence of individuals on the market is very low.

In practical terms, the effects of each of these models in relation to inequalities are very dynamic, since low inequality in certain periods can turn into high inequalities in others. However, broadly speaking, the liberal model is predicted to have little effect on reducing inequalities, since by targeting only the very poor, its impact only affects a portion of society, without producing any direct effect on the remainder of the distribution, which, in order to have its needs met, must resort to the market. The same effect happens to the conservative model, which, by creating different categories of

beneficiaries due to the level and type of their contribution, can increase inequalities between citizens in relation to a given public policy. On the other hand, the social-democratic model, which is characterized by being universal, tends to reduce inequalities between individuals, considering that everyone has the right to access a certain policy based on the eligibility criterion. As Esping-Andersen (1991) points out, this process is not linear and depends on some factors, such as the structure of income distribution in societies, for example, so that a social-democratic model may depend on a society of "humble" people to be effective, under the possibility of generating a middle class that demands better services and eventually resort to the market.

In political terms, the liberal welfare state model becomes viable when the right comes to power and constitutes a majority. Seeing the market as a solution to economic and social problems, the right-wing parties tend to implement public policies of a liberalizing nature, aimed at the poorest and that do not reduce citizens' dependence on the market. The conservative model is viable when the right or left does not constitute a majority and need to go to the center to form the government. While the social-democratic model becomes viable when the left comes to power and constitutes a majority, thus implementing policies that aim to reduce individuals' dependence on the market and thus emancipate them (Esping-Andersen, 1991). These relationships are the basis of the theory of party government.

By tracing the trajectory of social democracy, Przeworski (1991) shows that leftist parties had to deal with many contingencies along their path, until the original objective of socialism was abandoned to the detriment of public policies that would increase the good -being of the workers, all this made possible by the emergence of Keynesianism. Thus, we find in the social-democratic welfare state model strict ties with what was possible to materialize from the socialist ideas of the left-wing parties.

The object II of this study of investigating whether leftist parties increase the levels of state capacity of municipalities and thus reduce health inequalities is centrally based on the theory of party government, so that the hypothesis that is created from this formulation is that the answer is positive, and left-wing governments reduce health inequalities. However, it must be considered that the empirical exercise promoted in this study presupposes a potential de-commodification created by left-wing parties, since the increase in state capacities is not automatically reflected in the reduction of individuals'

dependence on the market. About the universality of the Brazilian public health system, at least in terms of rights, all individuals have the right to access the health system, however, when we are dealing with inequalities in terms of state capacities and therefore of policy outcomes, the perspective of ownership is shifted to the perspective of access to services. In summary, I argue that despite the universal design of the Brazilian public health system, the focus of this study is on potential inequalities in access to health policy services.

From another perspective, despite programmatic party ideologies, theories based on the assumption of economic voting postulate that redistribution and the consequent fall in inequality occur based on the interest of individuals in maximizing their economic gains. Meltzer and Richard's (1981) classic theory of the median voter, for example, postulates that in a society where there is inequality and universal suffrage, individuals tend to vote so that the median income becomes equivalent to the median income. Now from a party perspective, Downs (1999) states that the ultimate aim of parties is to reach power per se, so that the ideology they create and appropriate is a mere instrument for this purpose. Thus, in a society in which voters are inserted in a context of economic vulnerability and inequality, it is rational for parties to adopt ideologies that seek to combat such circumstances, so that they get these voters' sympathy and, consequently, their votes, enabling the conditions for winning elections and coming to power.

Supported in this Downsian perspective, objective I of this study is made, whose purpose is to identify whether the municipalities most dependent on the public health system have their level of state capacity expanded with a consequent reduction in health inequalities. The hypothesis that is formulated for this objective is that there is a positive correlation between the level of dependence on the public health system and the level of the state capacity indicator. The greater dependence of a population on the health system makes the parties seek to meet these needs, firstly through their discourse and ideology, and secondly through public policies when they reach the government, due to the mechanism what Downs (1999) calls "responsibility", according to which governments must implement the policies they defended in the campaign, under penalty of losing the "trust" of their voters. Due to these electoral assumptions, the indicators of state capacity and dependence on the public health system constructed to answer the objective I question were made by weighing the population aged 20 or over residing in the municipalities, as

this population is the closest of the total population of voters, which is the population 18 years or older.

4. Methodology

The concept of state capacity used in this study is understood as the state's capacity to implement public policies (Gomide, Pereira & Machado, 2017). So, dealing specifically with health policy, the measurement of the state capacity of Brazilian municipalities took place through the construction of a synthetic indicator that seeks to contemplate various aspects of the health structure of Brazilian municipalities. The construction of this indicator was inspired by the municipal health quality indicator constructed by a study by Centro de Estudos da Metrópole (CEM)[1]. The synthetic indicator of municipal state health capacity of this study was built from the following indicators available in DATASUS (2020): number of basic outpatient facilities, number of health professionals, number of health teams, number of health equipment[2] and number of dental offices, and all these indicators were weighted by the number of resident inhabitants (data also obtained from DataSUS) total or over 20 years (depending on the objective) of the respective municipalities and concern the administrative sphere municipal. The period of analysis of this study is from 2013 to 2015, and the calculation of the synthetic indicator was annual. The period covered in this study is justified by the fact that all data used are as recent as possible, as it is a consequence of a municipal election (2012), and therefore contemplates the beginning of a term, and prior to the immediately subsequent municipal election (2016).

Although the period covered by this study is short and makes it difficult to observe significant changes in the indicators of state capabilities, and consequently of potential inequalities in access to health, all units of analysis (municipalities) are being analyzed under the same criteria. This means, for example, that both left and non-left governments have the same time conditions to improve or not their state capacity indicators, or even that all governments had the same time conditions to whether or not they improve their state capacities and whether or not they are re-elected. The point highlighted here is that the analyzes intended here are relational between the municipalities and do not depend on the size of the time series.

Operationally, all indicators that make up the synthetic indicator were divided by the number of inhabitants in the respective municipality and multiplied by one thousand. Subsequently, each indicator was standardized on a scale ranging from 0 to 1, so that they

could be compared and unified. The standardization process excluded the outliers from the sample for this purpose, so that they were assigned the respective extreme value, that is, 0 or 1, considering that their extreme values could cause analytical distortions in the standardized indicators of the other municipalities. Table 1 below illustrates the maximum and minimum values used for standardization purposes, all of which correspond to the observations of 2014 and were used for all years so that the synthetic indicator could be compared over time, so that studies futures that aim to reconstruct the same synthetic indicator should use these values as a reference. The interpretation made, for example, from the maximum value of health establishments is that the municipality corresponding to this position has 2.02 health establishments per thousand inhabitants, while the municipality with the minimum value has 0 health establishments per thousand inhabitants, which may indicate a very small number of establishments in relation to the total population. Finally, all standardized indicators were added and multiplied by 2, so that each of the 5,570 municipalities now has a state health capacity index ranging from 0 to 10 for the years 2013 to 2015.

Table 01: Maximum and minimum values of health indicators in 2014

Indicator	Minimum	Maximum
Health facilities	0	2.0242
Dentistry office	0	1.3348
Health equipment	0	1.8220
Health professionals	1.0629	22.0225
Health teams	0	1.2663

Source: DATASUS (2020). Made by the author.

In accordance with the considerations presented in the previous sections, the indicator of state capacities used in this study is a proxy of inequalities in access to health services, considering that they are a necessary condition for the services to be actually carried out. So, the inequalities of access to health services dealt with in this study relate to potential inequalities, which are not necessarily the inequalities of access that the population deals with in their daily lives. Thus, it is assumed that the increase in state capacities in a given municipality tends to reduce potential inequalities in access to health services for the population of the respective municipality.

In accordance with objective I of this study, the measurement of the dependence of the population residing in municipalities on the public health system was based on the calculation of the resident proportion who do not benefit from a private health plan in relation to the total resident population in the municipality. From the data provided by

ANS, 2020, information was obtained on the number of individuals who have a private health plan by municipalities in Brazil in each of the years and from DATASUS (2020) the number of resident individuals per municipality. According to the theoretical considerations presented in section two of this study, the dependency ratio was calculated for the population over 20 years, and ideally the calculation would be for the population over 18 years, but in limitations this age has been substituted for the next highest possible age.

To fulfill objective II of this study, the party of municipal governments was identified from 2013 to 2015, and this attribution took place from those elected in the 2012 municipal election and were carried out based on official data provided by Tribunal Superior Eleitoral [TSE] (2020). The identification of the political orientation in these governments was given by the ideological classification of the parties carried out by Miguel, Krause and Machado (2017), so that, based on the parties, the municipal governments were classified as being of the left and not of the left (center and right). Finally, to achieve objective III, the verification of the re-election of municipal governments or the candidate (identified by the CPF) was based on the relationship from 2016 and 2012 elections, so that if the winning party in 2016 was the same as in 2012, the government was considered re-elected.

All econometric models built in this study, in addition to using the variables already mentioned and justified so far, also included control variables to better measure the estimates made. These variables are: total population residing in the municipalities (DATASUS); total current revenue (SICONFI, 2020); percentage of expenditure committed with health in relation to total current expenditure (SICONFI), despite the need for municipalities to be obliged to apply at least 15% of their net current revenue (RCL) in Ações e Serviços Públicos de Saúde (Constituição Federal, 1998, Art. 198).

The econometric models built were of the panel data type, made possible by the arrangement of indicators for three distinct and consecutive moments. This type of model is made by the information disposition from the same unit of analysis in different periods of time, and demonstrates a higher level of sophistication compared to cross-sectional models by estimating the effects of one variable on another in a variety circumstances. The specifications of the built models were random effects and the between effect, which is made by not making time distinctions, and instead treats the observations in different periods as being different from itself. Another model formulated was the logistic

regression, which measures the probabilistic effect of the explanatory variables in relation to the dependent variable and is also justified by its dichotomous nature (Wooldridge, 2016).

5. Results

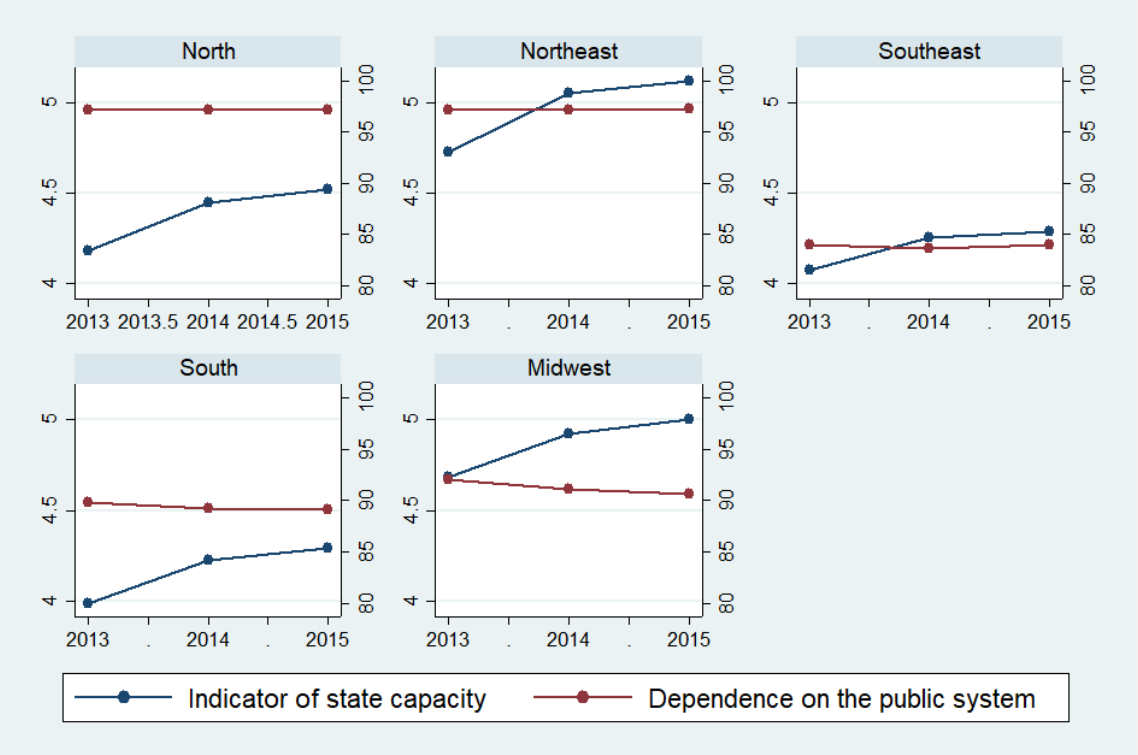
The following subsections have been divided in correspondence to the objectives, so that the "Results 1" subsection seeks to answer the objective 1 question, and so on.

5.1.Results I

Figure 1 shows the average of the state capacity in health indicator in Brazilian municipalities and the average of the dependence level on the public system from 2013 to 2015 by region. It is observed that in the period analyzed, there is an increase in the average of the state capacity indicator in all regions, with the Northeast and Midwest regions showing the highest growth and highest level of the indicator in absolute terms, while the regions South and Southeast show the smallest growths and levels of the indicator in absolute terms. In 2015, the Northeast and Midwest had an average of the state capacity indicator around 5 points, while the average for the South and Southeast was 4.2 points.

Regarding the population's level of dependence on the public health system, throughout the period there is relative stability in all regions. The highest levels of dependency are in the northeast and north regions, followed immediately by the midwestern regions, while the lowest levels of dependency are in the south and southeast, respectively.

Figure 01: Average of the state capacity in health indicator in Brazilian municipalities and average of the level of dependence on the public system from 2013 to 2015

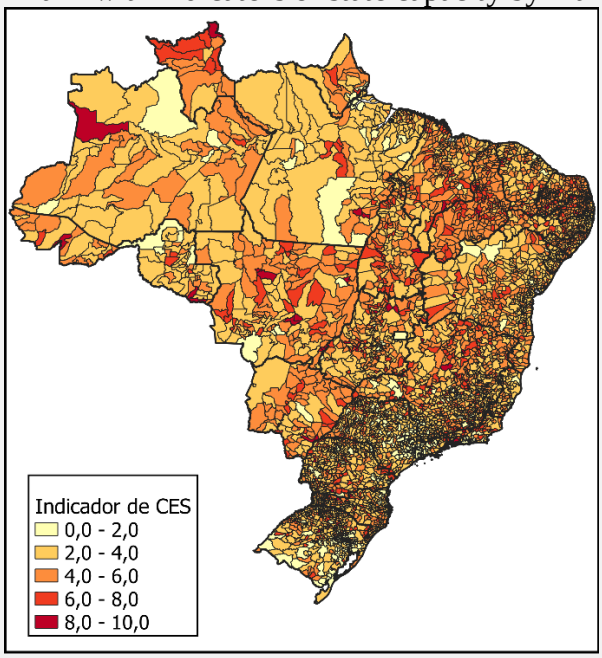


Source: research data. Made by the author.
Note: State capacity indicator ranges from 0 to 10, and dependence on the public system from 0% to 100%. Indicator weighting was based on the number of resident individuals aged 20 years or older

In order to spatialize the indicators of state capacity and the level of dependence on the public health system, Figures 2 to 7 below express these values through thematic maps. Figures 2, 4 and 6 address the indicators of state capacity. Although it is not feasible to individually compare the municipalities with each other, it is possible to observe the broader trends through the contrast of colors. So, the southeast region, especially São Paulo, has a large number of municipalities with lighter color, indicating a low level of state capacity, as well as the southern region, especially Rio Grande do Sul. On the other hand, the most orange and reddish regions are the Midwest and Northeast regions, in the first the states of Mato Grosso and Mato Grosso do Sul stand out, while in the second the states of Piauí and Paraíba stand out.

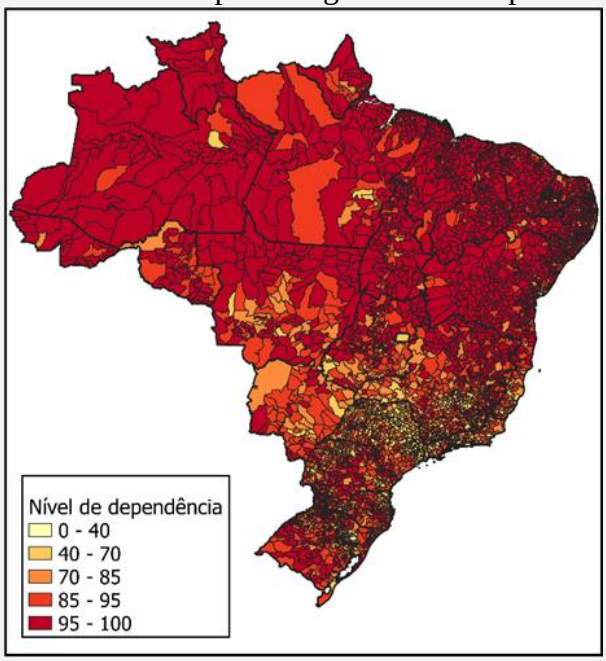
Figures 3, 5 and 7 express the dependence levels on the public health system. The rule is that municipalities have a high level of this indicator. However, the states of São Paulo, Rio de Janeiro, Espírito Santo, western Minas Gerais, northern Paraná, Mato Grosso do Sul, and southern Goiás have a low dependence level on the public health system in municipalities in other states.

Figure 02: Brazil with indicators of state capacity by municipalities in 2013



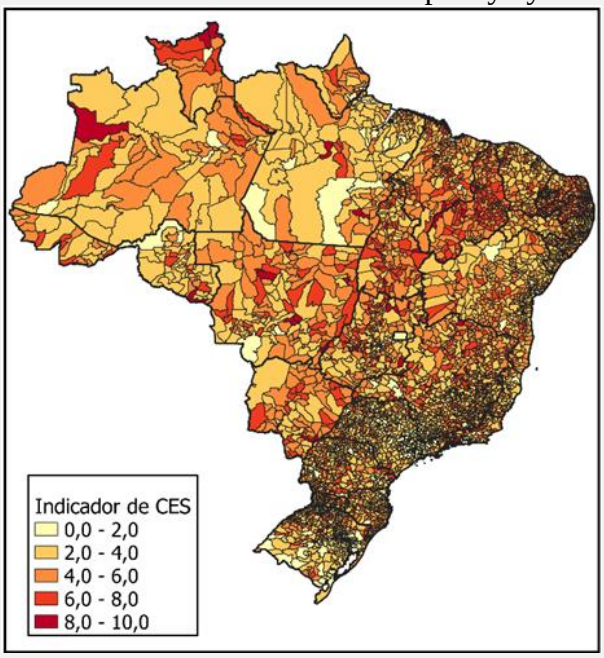
Source: research data. Made by the author

Figure 03: Brazil with the percentage levels of dependence in SUS in 2013



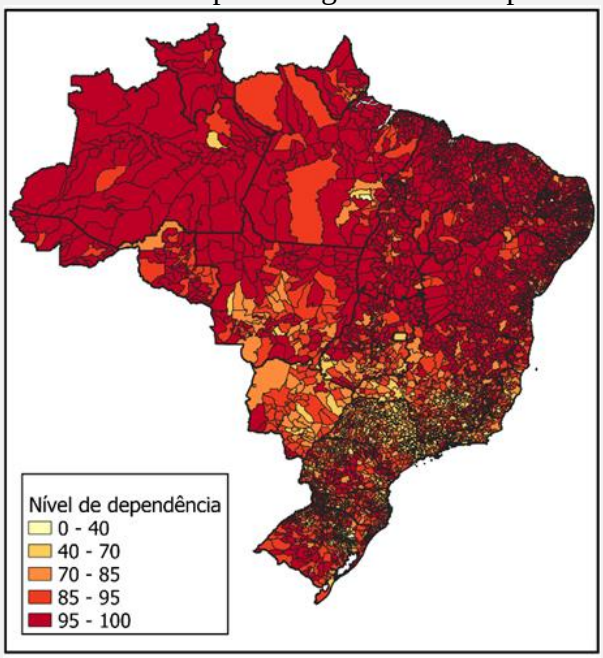
Source: research data. Made by the author

Figure 04: Brazil with indicators of state capacity by municipalities in 2014



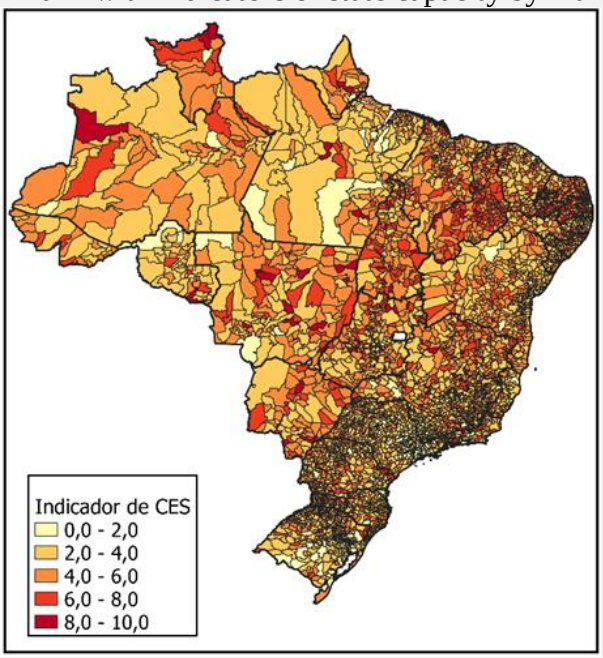
Source: research data. Made by the author

Figure 05: Brazil with the percentage levels of dependence in SUS in 2014



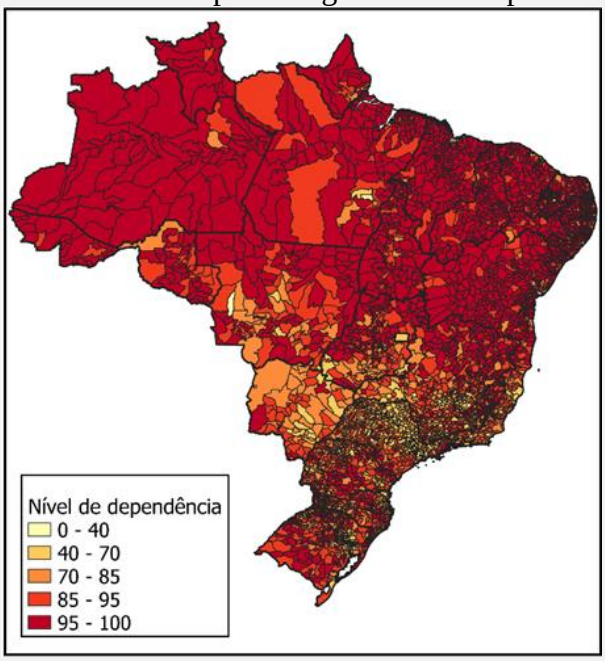
Source: research data. Made by the author

Figure 06: Brazil with indicators of state capacity by municipalities in 2014



Source: research data. Made by the author

Figure 07: Brazil with the percentage levels of dependence in SUS in 2015



Source: research data. Made by the author

Finally, Table 2 presents the results of the panel data regression models. The models were built with and without the use of log in the dependent variable to verify whether this factor had any effect on the estimated coefficients. As our main explanatory variable for the model is the level of dependence on the public health system, it is observed that the effects of dependence on the indicator of state capacity in health are positive and with statistical significance in all models built. This means that the greater

the population's level of dependence on the public health system, the higher the levels of the state capacity in health indicator, so that the potential inequality in the provision of health services is also potentially smaller, since that the greater provision of resources per inhabitant also increases their chances of accessing that resource.

Table 2. Results of panel data regression models

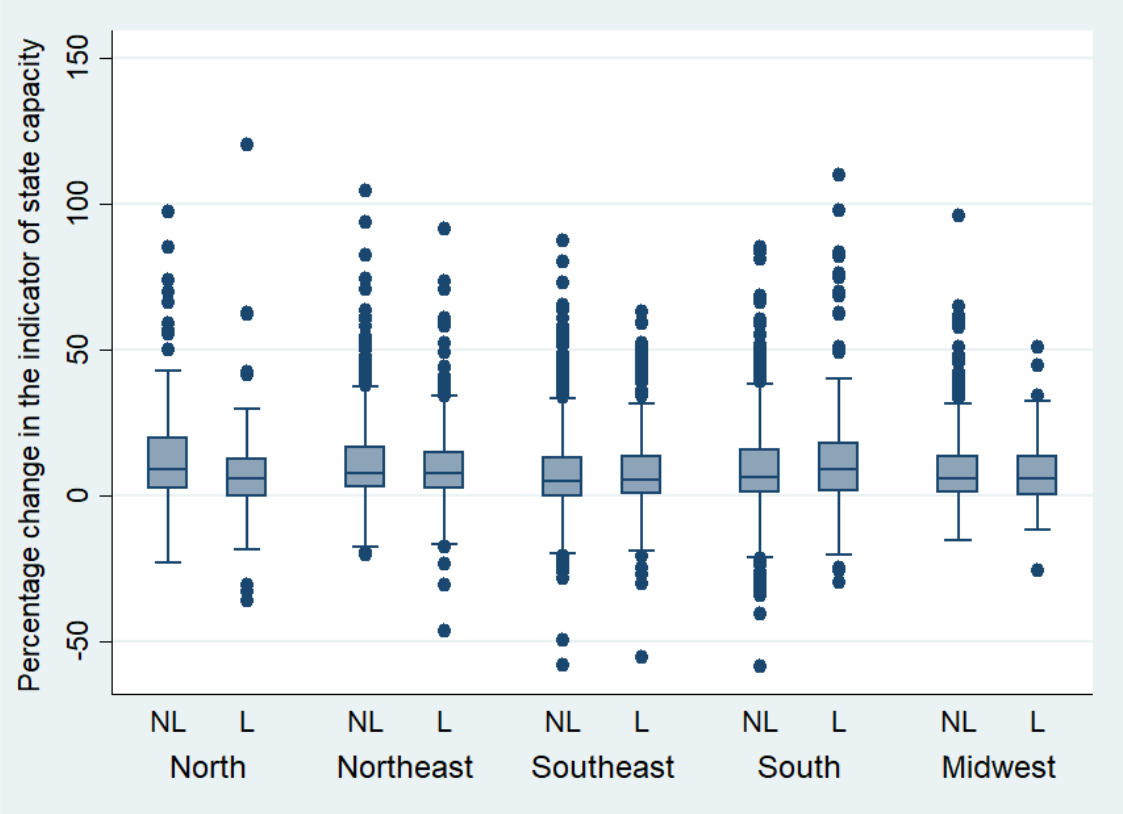
Indicator of state capacity in health	Dependent Variable with log		Dependent Variable without log	
	Random Effect	Between Effect	Random Effect	Between Effect
Dependence on SUS	0.0098938***	0.0120642***	0.0356496***	0.0415016***
	(0.0003)	(0.0004)	(0.0015)	(0.0018)
Total Population	-0.334e^{-06}***	-0.0814e^{-06}***	-0.958e^{-06}***	-0.00212e^{-06}
	(0.0227e^{-06})	(0.02.26e^{-06})	(0.0968e^{-06})	(0.0972e^{-06})
Log of total revenue per capita	0.005961***	0.149951***	0.028737***	0.5865931***
	(0.0008)	(0.0047)	(0.0039)	(0.0202)
% of health expenses on total income	4.78e-08	0.0000605***	-3.87e^{-06}	0.0002143**
	(2.78e^{-06})	(0.0000)	(0.0000)	(0.0000)
Constant	0.4647412***	-1.505.291***	0.9499468***	-6.447607*
	(0.0337)	(0.0619)	(0.1473)	(0.2668)
N total	16.075	16.075	16.077	16.077
N per group	5.538	5.538	5.538	5.538
R^2 - between	24.05%	36.28%	17.96%	28.67%
R^2 - overall	23.57%	29.67%	17.48%	22.70%

Source: research data. Made by the author.
Note: the indicator of state capacity in health and dependence on the public health system of these models was constructed based on the weighting of the population aged over 20 years old.
Statistical significance levels: *** < 1%; ** < 5%; * < 10%.

5.2 Resuls II

Figure 8 illustrates the percentage variation distribution of the state capacity indicator. There is no delimited pattern of behavior between the variation level by ideological orientation or region, so that there is growth and decline in both orientations and in all regions, although the median of the south and southeast regions is higher for municipalities governed by the left and the median of the northern region is smaller for municipalities governed by the left.

Figure 08: Box plot of the percentage variation of the state capacity in health indicator from 2013 to 2015 by region and ideological orientation of municipal governments

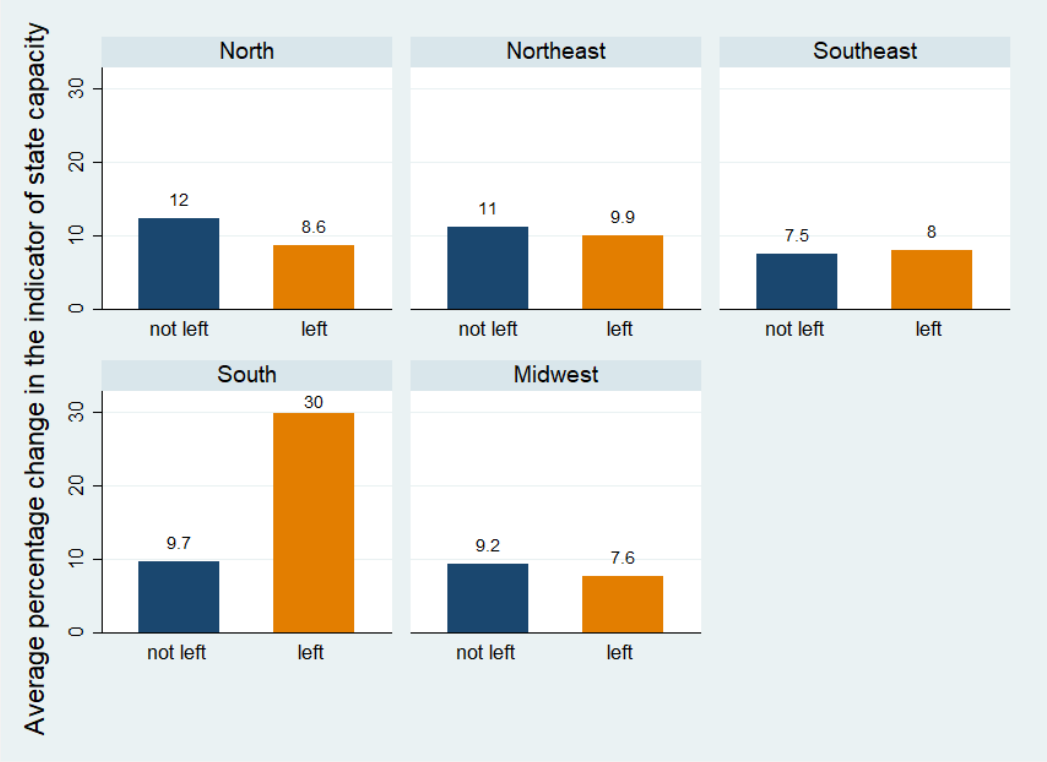


Source: research data. Elaborated by the author.
Note: NL (municipal governor's party is not left); L (the municipal government's party is on the left).

Although Figure 8 indicates that there are no clear differences in the distribution of variations in the state capacity indicator, Figure 9 demonstrates the average of the variations in the state capacity indicator by ideological orientation and region is clear. It is observed that the south and southeast regions have a higher average for the municipalities governed by the left, while the other regions have a lower average for the municipalities governed by the left.

Figure 09: Average percentage variation of the state capacity in health indicator from 2013 to 2015 by ideological orientation of municipal governments

1.



Source: research data. Made by the author.

Bearing in mind the upper average level of state capacity indicators for municipalities not governed by the left, Table 3 below expresses through the results of the panel data regression models that the municipal government party from the left, implies in a negative and statistically significant effect on the level of the state capacity in health indicator, keeping everything else constant (ceteris paribus). So left-wing parties, at the municipal level, have a negative effect on the state capacity indicator, while non-left parties (right and center) have a positive effect on the state capacity indicator. It is noteworthy that the dependent variable of this model is the indicator of state capacity in health, and not its variation in the period analyzed.

Table 03: Results of panel data regression models

Indicator of state capacity in health	Dependent Variable with log		Dependent Variable without log	
	Efeito aleatório	Efeito between	Efeito aleatório	Efeito between
Left party	-0.0508738***	-0.0229718**	-0.2287863***	-0.1139929***
	(0.0099)	(0.0094)	(0.0439)	(0.0422)
Dependence on SUS	0.0080705***	0.008344***	0.0283072***	0.0288821***
	(0.0003)	(0.0004)	(0.0015)	(0.0018)

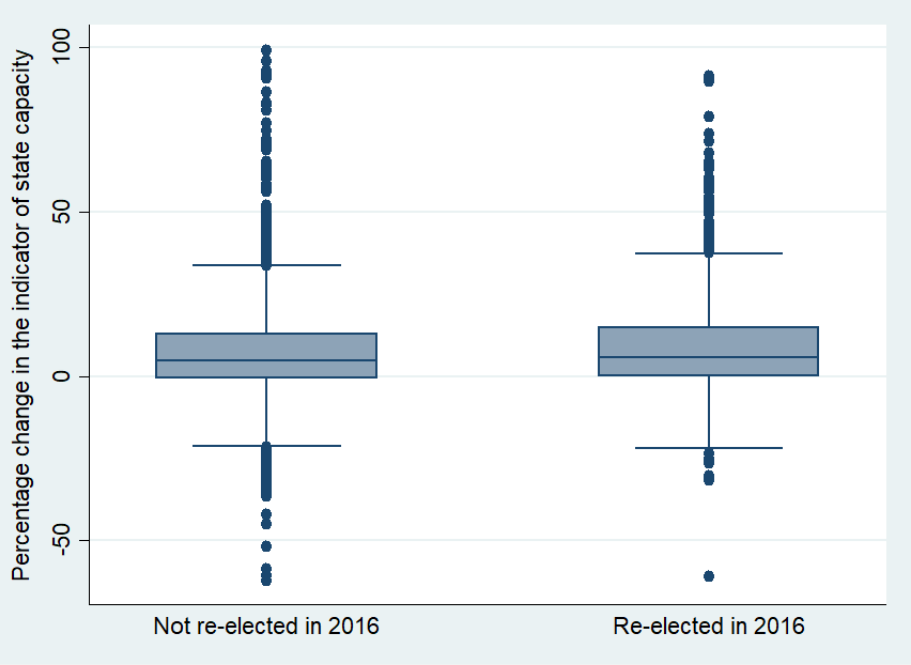
Total Population	-0.323e^{-06}***	-0.0754e^{-08}***	-1.03e^{-06}***	-5.65e-09
	(0.02.23e^{-06})	(0.0221e^{-06})	(0.0986e^{-06})	(0.0983e^{-06})
Log of total revenue per capita	0.0074853***	0.1669191***	0.0342475***	0.6921043***
	(0.0009)	(0.0046)	(0.0041)	(0.0205)
% of health expenses on total income	0.184e^{-06}	0.0000788***	-4.00e^{-06}	0.0003188***
	(3.01e^{-06})	(0.00001)	(0.00001)	(0.00009)
Constant	0.6586966***	-1.337474***	1.748662***	-6.437476***
	(0.0344)	(0.0611)	(0.1527)	(0.2717)
N total	16.076	16.076	16.077	16.077
N per group	5.538	5.538	5.538	5.538
R^2 - between	19.14%	34.41%	14.23%	28.41%
R^2 - overall	18.71%	26.28 %	13.78%	20.91%

Source: research data. Elaborated by the author.
Note: the indicator of state capacity in health and dependence on the public health system of these models were constructed based on the weighting of the total population residing in the municipality.
Statistical significance levels: *** < 1%; ** < 5%; * < 10%.

5.3 Results III

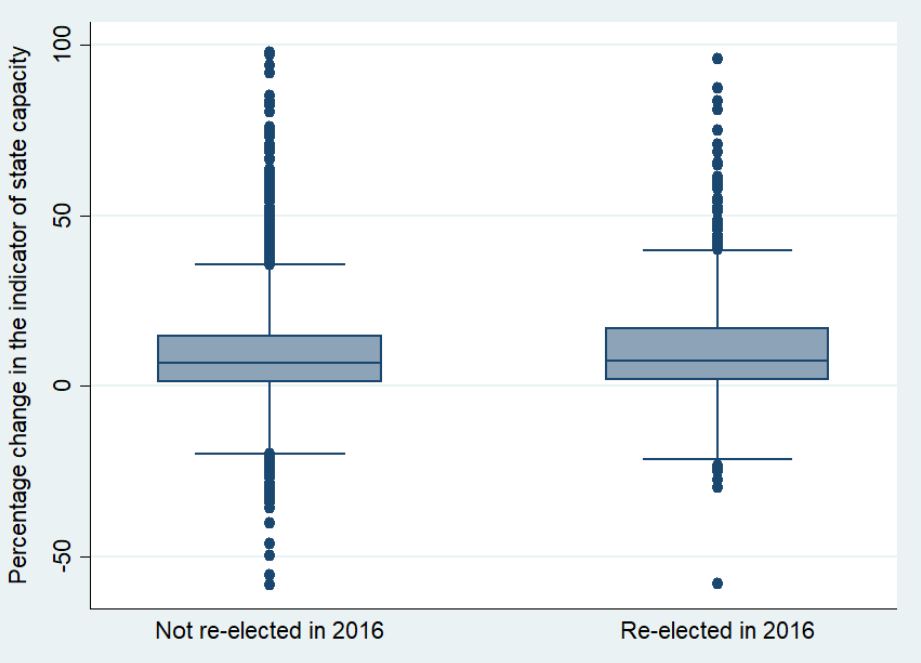
Figures 10 and 11 show the variation distribution of the state capacity indicator among reelected and non-reelected governments in 2016, with the first dealing with the indicator weighted by the population aged 20 or over, which approximates the group of voters, and the second deals with the indicator weighted by the total population. It is observed that in both distributions there are no significant differences between the elected and the non-elected groups, thus, the tendency of re-election of municipal governments cannot be verified due to the variation in the state capacity indicator. This suggests that this variation does not correlate with electoral results, or that there are many other factors that need to be controlled to measure the effect of a possible correlation between these variables.

Figure 11: Box plot of the percentage change in the state capacity indicator weighted by the population aged 20 or over and by governments re-elected or not in 2016



Source: research data. Made by the author.

Figure 12: Box plot of the percentage variation of the state capacity indicator weighted by the total resident population and by governments re-elected or not in 2016



Source: research data. Made by the author.

The results of the logistic regression model expressed in Table 5 indicate that there is a positive and statistically significant correlation between the percentage change in the state capacity indicator weighted by the population aged 20 years and over and the

reelection of municipal governments. In practical terms this means that the growth of the state capacity indicator weighted by the population of 20 years or more increases the probability of re-election of the municipal government. On the other hand, although the variation of the indicator weighted by the total population increases the probability of reelection, since the estimated coefficient is positive, it does not have statistical significance and its dimension is very small, and therefore its practical interpretation is innocuous.

Table 05: Results of the logistic regression model

Re-elected Parties in 2016 (dependent variable)	Weighting by population over 20 years	Weighting by total resident population
Percentage change in the state health capacity indicator between 2013 and 2015	0.0089159***	0.0000436
	(0.0019307)	(0.0003386)
Constant	-0.9107035***	-0.8383826***
	(0.0335313)	(0.0294151)
N	5.569	5.570

Source: research data. Made by the author.
Note: p-value of the explanatory variable weighted by the total population is 97.1%.
Statistical significance levels: *** < 1%; ** < 5%; * < 10%.

6. Discussão dos resultados

The results in the previous section show convergences and divergences with the hypotheses initially formulated in light of the theoretical discussion carried out. Results 1 indicate, both by descriptive analysis and by estimation analysis, that the greater dependence of voters on the public health system presents a close positive correlation with the indicator of state capacity in health, and thus with the reduction of potential health inequalities. These results converge with Downsian expectations (Downs, 1999) that parties seek, through their ideology, to attract the greatest number of voters to win the elections and reach power, later implementing public policies that meet the expectations created during the elections. Thus, as voters are highly dependent on the public health system, there is also a trend towards a reduction in potential health inequalities through increased state capacities, considering that the entire population is a user of the public health system.

On the other hand, the results 2 do not agree with the hypothesis formulated in the light of the party government theory, so that left-wing governments show a negative

correlation with the levels of state capacity in health and, consequently, with the reduction of potential health inequalities, even when controlling the econometric models by the population size of the municipalities and their capacity to implement public policies, measured by the per capita revenue of the municipalities. Descriptive analyzes indicate that, on average, non-left governments have higher levels of state capacity in health, however the distribution analysis, which focuses on the position of individual units, indicates that both non-left governments and governments that are on the left have all levels of state capacity for distribution. Thus, without a very clear and unanimous systematization about the sense of causality between the ideological orientation of governments and the level of state capacity in health, it can be considered that both non-left and left-wing governments have different levels of state capacity as a result of management.

Finally, result 3 indicates a convergence with the hypothesis formulated for this objective, as it was expected that there would be a positive correlation between the increase in state capacities in health and the reelection of governments in the election immediately after the period analyzed. Descriptive analyzes do not demonstrate a clear relationship between increased state capacities and the reelection of municipal governments, however the analysis of estimates indicates that the variation in the state capacity indicator weighted by the number of voters is positive and with statistical significance, which allows us to conclude that voters are likely to reward municipal governments through elections when they increase levels of state capacity and thus reduce potential health inequalities. The same correlation is also observed in relation to the variation of the state capacity indicator weighted by the total population and the reelection of municipal governments; however, its coefficient is not statistically significant.

It could also be questioned about the margins of discretion that local governments have to manage their resources and increase their levels of state capacities and thus reduce potential inequalities in health, considering that the linking of tax revenues to municipalities in 15% for Public Health Actions and Services (Federal Constitution, 1988) would tend to limit municipal managers in terms of their allocation preferences. However, Marenco and Cate (2021) demonstrate that municipalities have many different spending margins among them between 2013 and 2016, with a median of 23.2%, with a minimum value of 11.1% and a maximum of 35.9%, which represent a standard deviation of 4.66 and an interquartile range of 5.55 in the analyzed cycle. Although the values found

by the authors are not the reference for minimum health expenditure, considering that the total expenditure on health is adopted and not with the Public Health Actions and Services category, and the total revenue and not the tax revenues, it is observed that these dispersions indicate that local governments have sufficient autonomy to express their allocative preferences and, based on this, build their state capacities.

7. Final considerations

This article sought to analyze health inequalities in Brazilian municipalities from the perspective of state capacities, considering that these are a necessary condition for municipalities to implement their health policy and thus be able to reduce health inequalities among individuals. This objective was linked to theories, so that the validity of some of them was tested for the context and object with which they studied. Descriptive and econometric methodologies were used to answer the questions asked, always seeking to establish a relationship between the methodological choices and the theoretical foundations used to build the study. The main explanatory variables of the constructed models were the dependence of voters on the public health system, the ideological orientation of the municipal government parties and the percentage change in the state capacity indicator in the period considered.

Considering the health policy importance for the individuals' well-being, especially when considering that the dimension of well-being linked to health is related to several other dimensions of well-being, the dynamic understanding involving political policies and the promotion of state capacities, to reduce health inequalities among individuals, proves to be essential for promoting equity and increasing individual and collective well-being, especially among the worst situated. In this perspective, it was found that the greater dependence of voters on the health system is correlated with higher levels of state capacity, regardless of the party ideology of the municipal government, in addition to the fact that voters tend to electorally reward municipal governments that improve the levels of state capacity and thus reduce potential health inequalities. Additionally, it was found that the population size of municipalities tends to negatively impact the level of state capacity while the total per capita income tends to positively impact the level of state capacity in health.

Despite having sought methodological rigor both in the construction of descriptive analyzes and in the estimation analyses and having sought interpretations of the phenomena based on the combination of both, it is important to emphasize that the

analyzes performed do not necessarily infer causality, which is one of the limitations of the study. Thus, it is suggested that, in addition to the analyzes carried out here, they be submitted to other analysis methodologies, such as impact assessment, which can measure causality effects more precisely. Another limitation of this study was that it did not consider the different sizes of municipalities in the descriptive analyses, which limited some conclusions about possible local management dynamics, even though the population size was controlled in the econometric models and this limitation does not invalidate the results and conclusions of the study.

For future study, it is suggested that management aspects related to the capacity of municipal governments produce state capacities and thus implement public policies be further explored, in addition to studying with the final results of health policies, and not with the potential effects that state capacities can provide, thus approaching the impacts of political phenomena of health inequalities.

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