

The challenges of funding the Brazilian health system in fighting the COVID-19 pandemic in the context of the federative pact

Gustavo Andrey de Almeida Lopes Fernandes ¹

Blenda Leite Saturnino Pereira ²

¹ Fundação Getúlio Vargas / São Paulo School of Business Administration, São Paulo / SP – Brazil

² Universidade de São Paulo / Public Health Faculty, São Paulo / SP – Brazil

The improvement of rules to fund the Brazilian health system (SUS) in states and municipalities is one of the major public health challenges in Brazil. The purpose of this article is to contribute to this broad debate, analyzing the government's response to the challenge of combating COVID-19, from the perspective of public financing of health services of Brazilian subnational governments. A qualitative and quantitative approach is adopted, combining documentary analysis and regression analysis. The results show that there was no substantive change in the criteria for transfers, which are not sensitive to epidemiological factors. Adjustments to the application rules were made to speed up spending. Population size, production of local wealth, and the number of hospital beds are the main factors that define the distribution of resources. The funding design for combating COVID-19, as well as the volume of resources, are insufficient in view of the scale of the crisis.

Keywords: COVID-19; health; public administration; public finance; federalism

Os desafios do financiamento do enfrentamento à COVID-19 no SUS dentro do pacto federativo

O aprimoramento das regras de financiamento do Sistema Único de Saúde (SUS) em estados e municípios é um dos grandes desafios da saúde pública no Brasil. O objetivo deste artigo é contribuir para este amplo debate, analisando a resposta governamental ao desafio de combate à COVID-19, sob o prisma do financiamento público dos serviços de saúde dos governos subnacionais brasileiros. Uma abordagem quali-quantitativa é adotada, mesclando-se análise documental e análise de regressão. Resultados mostram que não houve mudança substantiva nos critérios de repasse, pouco sensíveis a fatores epidemiológicos. Ajustes nas normas de aplicação foram realizados para dar maior agilidade aos gastos. Tamanho populacional, produção de riquezas locais e número de leitos de internação parecem ser os principais fatores que definem a distribuição dos recursos. O desenho de financiamento do combate à COVID-19, assim como o volume de recursos parecem ser insuficientes frente à dimensão da crise.

Palavras-chave: COVID-19; saúde; administração pública; finanças públicas; federalismo.

Los desafíos de la financiación del enfrentamiento a la COVID-19 en el SUS dentro del pacto federativo

La mejora de las normas de financiación del Sistema Único de Salud (SUS) en los estados y municipios es uno de los principales desafíos de salud pública en Brasil. El propósito de este artículo es contribuir a este amplio debate, analizando la respuesta del gobierno al desafío de combatir COVID-19, bajo el prisma de la financiación pública para los servicios de salud de los gobiernos subnacionales brasileños. Se adopta un enfoque cualitativo cuantitativo, que combina el análisis documental y el análisis de regresión. Los resultados muestran que no hubo cambios sustanciales en los criterios de transferencia, poco sensibles a los factores epidemiológicos. Se hicieron ajustes a las reglas de aplicación para acelerar el gasto. El tamaño de la población, la producción de riqueza local y el número de camas de hospital parecen ser los principales factores que definen la distribución de los recursos. El diseño de financiamiento para combatir COVID-19, así como el volumen de recursos, parece ser insuficiente en vista de la magnitud de la crisis.

Palabras clave: COVID-19; salud; administración pública; finanzas públicas; federalismo.

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1. INTRODUCTION

The battle against the effects of COVID-19 has become a global emergency (Wang, Horby, Hayden, & Gao, 2020). Since the beginning of the outbreak in China, many countries have been stricken by its enormous economic impact and above all its impact on their health systems. The initial experiences of this have been of vital importance to the countries stricken next, including Brazil.

Legido-Quigley et al. (2020) have enumerated the lessons learned in Spain. First of all, additional financial resources are necessary to support subnational governments. Secondly, the underfinancing of the health area harmed the human as well as material aspects of this. Good national coordination is fundamental to effectively facing this crisis, which was also observed in Italy (Anderson, Heesterbeek, Klinkenberg, & Hollingsworth 2020).

Due to the disease, immediate adjustments need to be made to the health system given the increase in certain services (Grasselli, Pesenti, & Cecconi, 2020). In an influential study at Imperial College, Walker et al. (2020) indicated a scenario of collapsing health systems, due to the peak of demand, leading to an extreme number of deaths. In Brazil, Araújo and Morais (2020), using data from the state of Ceará, have already presented signals of this trend. To Walker et al. (2020), mitigating measures such as social distancing are extremely necessary, because they result in better conditions for health systems.

Given this, an immediate response is an increase in health spending (Legido-Quigley et al., 2020). However, in this aspect the Brazilian scenario is not favorable. Vieira and Santos (2018), analyzing service data from the Ministry of Health between 2002 and 2015, found that the limits authorized for payment were insufficient to cover the costs of each service, illustrating a lack of financial resources. Marques (2017) demonstrates that the underfinancing of the Unified Health System (SUS) in Brazil is structural, with there being no strong political support for allocating more funds to the system. With more recent data, Pereira and Faleiros (2019) have demonstrated that fiscal forgiveness in recent years, in addition to the economic crisis, have reduced the funds available to the SUS.

Thus, despite the great restriction in terms of federal revenues, federal government transfers are the main source of funds for SUS health services (Leite, Lima, & Vasconcelos, 2012; Santos, 2018; Lima & Andrade, 2009). However, the rules utilized have intensified the inequality of the system, and are also not necessarily linked to epidemiological or social factors. To Lima (2007), for example, there is a lack of planning in the rules for the distribution of SUS's financial resources. In this aspect, the pandemic has imposed a series of challenges to the system due to the characteristics of the disease.

In this work we propose to investigate the compatibility of the adopted financing rules with the idiosyncrasies of COVID-19. This is an important contribution to studies in this area, considering the possibility of a new pandemic or outbreaks of epidemics in various regions in the country, with there being a fundamental need to improve the financing rules of SUS in the formulation of public health policy. As a result, the objective of this article is to analyze the federal government's response to the COVID-19 pandemic, from the point of view of the public financing of health services in Brazilian subnational governments which administrate the main structures in the battle against this disease.

This work is divided into seven sections. Following the introduction, we will present a brief review of the literature about SUS financing, culminating in the study's hypothesis. Then we will present our methodology followed by an analysis of the applied rules as well as recent changes. The fourth section

will consist of a discussion of the origin of the funds and this will be followed by an examination of the process of allocating funds on the subnational level. In the sixth section, we will analyze the profile of the federal government transfers and indicate the overall state of the financing used to face the pandemic, and then will present our conclusion.

2. THE PROBLEM OF FINANCING HEALTH SERVICES

The financing of public health actions and services according to the Federal Constitution is the responsibility of the three spheres of SUS management. However, ever since its inception the financing of this system has been hotly disputed. To Mendes (2014), there exists a tension between the implementation of health as a social right and the discourse of containing costs and the strangling of financial resources.

Mendes and Marques (2009) have verified that between 1990 and 2000 there was no relevant increase in the financing of the sector; on the contrary, there were various attempts to cut aid to this sector. Scatena, Viana, and Tanaka (2009), analyzed municipal records, and pointed out a growing disparity between revenues and expenses, with a great increase in costs.

More recently, examining data from 2008-2009 and 2015-2016, Contarato, Lima, and Leal (2019) observed that there was a growth in per capita spending despite the economic crisis, suggesting that the existence of some form of protection in relation to this link. In any event, the recurring reduction of federal funding, especially after Constitutional Amendment n. 95 (2016), has ended up pressuring the budgets of other entities, generating a need for alternative sources of revenue (Funcia, 2019; Pereira, Oliveira, & Faleiros, 2019). During this period, however, studies demonstrate a loss of capacity in the supply of resources as O'Dwyer, Graever, Britto, Menezes, and Konder (2019) show in a study of municipalities within the state of Rio de Janeiro.

In this context, federal transfers have been fundamental to the performance of health services within the SUS environment, given the fragility of state and municipal sources of revenue (Lima & Andrade, 2009; Leite et al., 2012; Santos, 2018). Vazquez (2011) also points out the role of conditional federal transfers in inducing local costs. To Lima (2007), however, the lack of integrated planning among the criteria which govern the redistribution of revenues for financing SUS ends up reinforcing the existing patterns of asymmetry. Piola, França, and Nunes (2016) show that, even during periods of revenue growth for all levels of government, such as the period from 2000 to 2010, regional inequalities in terms of per capita spending remaining practically unchanged.

Transfers originating from congressional amendments have also been an alternative source of revenues. However, Baptista et al. (2012), analyzing amendment funding from 1997 to 2006, point out that the criteria followed a logic which was governed much more by politics than health services planning. In this sense, Santos (2018) points to errors in the actions of the Ministry of Health itself in improving the regional coordination of SUS by the states.

Battesini, Andrade, and Seta (2017), analyzing the distribution of federal funds for health supervision from 2005 to 2012, indicated that the adoption of unified per capita criteria throughout the country led to increased inequality among the states. Reforming these criteria, however, does not appear to be a simple task. Cabreira, Ritter, Aguiar, and Celeste (2018), using data from municipalities from the state of Rio Grande do Sul, indicated that health spending appears to be more linked to federal

induction policies that factors associated with the demand for healthcare, such as their demographic and epidemiological profiles. Similar results were found for Bahian municipalities by Teles, Coelho, and Ferreira (2016). Harzheim et al. (2020), in turn, suggest a transfer distribution system based on socioeconomic vulnerability and demographic indicators as well as payment for indicator performance, endorsing the critiques of the current criteria.

The financial fragility of the services provided by SUS is a recurring problem. The case of a pandemic caused by a new disease with a lack of large studies represents an even greater challenge. According to Weiss and Murdoch (2020), roughly 19% of those with COVID-19 need hospitalization, while the mortality rate for infections has been approximately 2.2% (Chan et al., 2020). Densely populated communities run greater risks given that the virus can be transmitted by aerosols, which compromises one of the most important tools to fight the pandemic, social distancing. To mitigate the consequences of the pandemic, there immediate adjustments need to be made in the health system which increase the supply of services needed to meet the exceptional demand caused by this virus's infections (Anderson et al., 2020; Grasselli et al., 2020). An influential study at Imperial College, Walker et al. (2020) indicates a scenario in which health systems will collapse due to the peak in demand, leading to an extreme number of deaths.

As a result, given the inequity in the repartition of SUS resources and the characteristics of COVID-19, we arrive at this study's hypothesis.

Hypothesis: the SUS financing model within the Brazilian federal pact has been modified due to the need to confront the COVID-19 outbreak.

In other words, we seek to infer whether the volume of financial resources and the rules employed in the costing of policies battling the COVID-19 outbreak have been influenced directly by the characteristics of the pandemic, in terms of the logic of SUS financing within the Brazilian federal pact.

As highlighted in this brief review of the literature, allocation criteria for the transfer of funds based on the number of inhabitants or users of provided health services are common in SUS. Nonetheless, the characteristics of COVID-19, as a heterogeneous contagion in a continental country like Brazil impose a series of challenges of a practical nature. In Spain, for example, the national health system is strongly decentralized with great involvement by autonomous communities (Pereira et al., 2019). However, facing a pandemic has imposed an unprecedented centralization of the country's health system, modifying, in at least a temporary and profound manner, the dynamics of its functioning (Legido-Quigley et al., 2020).

3. METHODOLOGY

To answer the question raised by this study in terms of the compatibility between the financing rules adopted by SUS and the idiosyncrasies of COVID-19, we have employed a strategy of mixed methods (McNabb, 2002). Our first step was to perform broad documental analysis of the legislation which defines the rules of financing in the fight against COVID-19. Schema 1 details this process.

SCHEMA 1 STEPS OF THE QUALITATIVE PHASE



Source: Elaborated by the authors.

First, we researched the legislation involved in the electronic websites of the Ministry of Health as well as the Official Government Press from February 1 to June 12, 2020, addressing the financing of the policies designed to confront COVID-19 on the subnational level. The second step was to select the norms which specifically cover the definition of the rules and the authorization of financial transfers. Rounding out the qualitative phase, we examined the rules and financial transfers, which enabled us to design an implicit financial model.

The second phase of the study was to analyze the transfers effectively received by the municipalities, seeking to infer whether the SUS financing model, within the Brazilian federal pact, is consistent in relation to the epidemiological characteristics of COVID-19. In this manner, we estimated a linear function using the ordinary least square method with robust estimators (Greene, 2002):

Equation 1

$$y_i = \alpha_0 + \alpha_1 X_i + \alpha_2 Z_i + \alpha_3 C_i + u_0$$

The dependent variable y_i indicates the total of transfers received by municipality i . The data was obtained from the transparency portal of the National Health Fund (FNS) (https://painelms.saude.gov.br/extensions/TEMP_COVID19/TEMP_COVID19.html). X_{i_i} is the vector of variables which describe the potential expansion of the disease. Thus, in accordance with Feng et al. (2020) and Wang et al. (2020), we used the population density of the municipality given the role of population density in the degree of contagion, as well as the distance to the respective state capital and Brasilia, as *proxies* to capture the impact of the municipality being close to the main points of entrance in the state affected by COVID-19 – using data from the Brazilian Institute of Geography and Statistics (IBGE). Supposing that the financing rules are consistent with the characteristics of the disease, we have sought to infer whether both coefficients are positive and statistically significant.

Z_i meanwhile reflects the group of explanatory variables which seek to evaluate the local SUS's expansion potential to meet the excessive demands due to this disease. With this purpose, we used per capita health spending, and the number of normal hospital beds and intensive care beds.

We have also included control variables (C_i) which describe the socioeconomic conditions of the municipalities, such as the municipality's gross product (GDP), its number of inhabitants, whether it is a state capital, and finally infant mortality (Araújo, Gonçalves, & Machado, 2017; Kilsztajn, Rossbach, Câmara, & Carmo, 2003). All of this data was obtained from the National

Treasury Database (FINBRA), FNS/MS, the National Registry of Health Establishments (CNES) and IBGE. We would like to point out the reliability of the data collected by the National Health Fund (FNS/MS) which registers the individual transfers and makes it possible to accompany the bank balances of the respective linked accounts.

4. RESULTS

4.1 Basic rules for expansion: changes and consequences

The norms for transferring funds to subnational governments are regulated by Consolidation Ordinance n. 6 (2017). Federal funds are transferred from fund to fund, or in other words, from the FNS to the respective state and municipal funds. The financing system for public health consisted of six distinct blocks through 2017, and then was reduced to just two blocks: the costing of actions and services and investment in the public service network. The normative evolution is described in Figure 1.

FIGURE 1 LEGISLATION: BASIC APPLIED RULES

Publishing of Ordinance n. 204 - Creation of Financing Blocks: Basic Attention, Medium and Complex Attention, Out-Patient and Hospital, Health Supervision, Pharmaceutical Assistance, SUS Management	Revocation of Ordinance n. 204 and Publication of Ordinance n. 3992 - Creation: Block for Costing Public Health Actions and Services; Block for Investing in the Public Health Service Network	Alteration of Ordinance n. 3992 and Publication of Ordinance n. 828 - Blocks were given a new nomenclature: Block for Public Health Action and Service Maintenance, Block for Structuring the Public Health Service Network
• January 29, 2007	• December 28, 2017	• April 20, 2020

Source: Elaborated by the authors based on the National Press.

This division establishes that the resources within each financing block should be applied strictly to the items that belong to that block in accordance with the ordinance which originated the transfer. Thus, subnational entities should be organized to meet the application norms defined by the transferrer to receive the funds, with no shifting of funds between the blocks being permitted; leftover funds should be invested in financial applications that can be automatically retrieved on the date of their utilization.

The absence of discretion has led to difficulties in managing the funds to confront the COVID-19 crisis, which were only mitigated with the issuing of Ordinance n. 828 (2020) on April 17, 2020. During the initial phase of fighting the pandemic, the use of costing resources for adjusting the existing structure was expressly prohibited, with any modifications needing to be paid using solely the investment block.

The repercussion of the effects of a lack of discretion is a relevant factor. According to FNS data, a total of R\$ 9.57 billion has been transferred to the states, the Federal District and the municipalities to fight the COVID-19 pandemic. Since all of this money was allocated to the costing block which was

subsequently renamed the maintenance block, the possibilities of spending to adapt the healthcare apparatus were reduced.

To illustrate this, with the financial resources received from the federal government the subnational governments can acquire individual protection equipment such as gloves and masks. However, money from the maintenance block cannot be used to buy new hospital beds, infusion pumps for respirators, heart monitors, or electrocardiographs, among other items. An analysis, for example, of the portal of the National Board of Municipal Health Secretariats (Conasems, 2020) indicates a recurrence of requests for clarifications in this sense. Therefore, it was only in mid-April with the issuing of the referred to ordinance that these difficulties were mitigated.

4.2 The financial resources to fight COVID-19

By the middle of June, seven provisional measures – displayed in Diagram 1 – had been published, making extraordinary credit available to the Ministry of Health to confront the COVID-19 pandemic, totaling R\$ 38.96 billion. Part of these funds originated from internal shifts in the ministry’s budget, given that in 2020 the total funds available to the ministry were R\$ 172.3 billion, a value 21.95% greater than its original allotment (R\$ 134.7 billion) and equivalent to a 20.12% increase compared to the updated budget of the previous year.

An analysis of the provisional measures shows that the extraordinary credit offered came from a variety of sources. The cancelling of part of the fixed expenses in budgeted actions associated with individual congressional amendments stands out. In this case, there was R\$ 4.8 billion which before was allocated to the Temporary Increment of Hospital and Out-Patient Assistance Costing (R\$ 1.63 billion) and the Temporary Increment to Basic Attention Services Costing (R\$ 3.16 billion). Besides this, there was the annulation of budgetary allotments to state amendments, the mandatory execution of other government organs (R\$ 2.0 billion), and new financial resources mostly originating from credit operations of linked sources.

DIAGRAM 1 EVOLUTION OF PROVISIONARY MEASURES UP UNTIL JUNE 12, 2020

March	April	May	June
<ul style="list-style-type: none"> •Provisionary Measure nº 924 of March 13, 2020 - 4,838,795,979.00 	<ul style="list-style-type: none"> •Provisionary Measure nº 940 of April 2, 2020 - 9,444,373,172.00 •Provisionary Measure nº 941 of April 2, 2020 - 2,048,736,866.00 •Provisionary Measure nº 947 of April 8, 2020 - 2,600,000,000.00 	<ul style="list-style-type: none"> •Provisionary Measure nº 967 of May 19, 2020 - 5,566,379,351.00 •Provisionary Measure nº 969 of May 20, 2020 - 10,000,000,000.00 	<ul style="list-style-type: none"> •Provisionary Measure nº 976 of June 4, 2020 - 4,489,224,000.00

Source: Elaborated by the authors based on the National Press.

According to data from the Federal Government's Integrated Planning and Budgeting System (SIOP) as of June 14, 2020, the majority of the funds allotted to fight COVID-19 came from two sources: Brazilian Treasury Bonds and Other Applications and Funds Allotted to Social Security.

In turn, the rate of budgetary execution has been relatively slow, especially considering the strategy of preparing the health system for the epidemic curve by flattening it to buy time through the adoption of measures of social distancing (Anderson et al., 2020). It should be noted that a much faster rate of execution has occurred in the transfer of resources dedicated to the municipalities and states, with the slowest rate of execution occurring on the federal level.

TABLE 1 VELOCITY OF EXECUTION IN THE FIGHT AGAINST COVID-19

Type of Application	Current Allotment	% CA	Expenses Paid	% Exp. Paid	Updated % Exp. Paid
Transfers to the States and Federal District – Fund to Fund	9,970,237,045.00	25.59	3,886,107,282.34	34.49	38.98
Transfers to Municipalities	96,246,041.00	0.25	–	0.00	0.00
Transfers to Municipalities – Fund to Fund	16,800,581,107.00	43.11	5,640,948,966.55	50.07	33.58
Transfers to Private Non-Profit Institutions	12,000,000.00	0.03	5,000,000.00	0.04	41.67
Transfers Abroad	542,294,000.00	1.39	432,376,875.00	3.84	79.73
Direct Applications	11,589,288,382.00	29.74	1,302,728,873.03	11.56	11.24
Total	38,967,509,368.00		11,267,161,996.92		28.91

In Brazilian reais.

Source: Elaborated by the authors based on SIOP/ME.

According to data from the SIOP/ME, of the expected total, approximately 29% of the budget has been applied by the Ministry of Health itself, with most of the transfers remaining to be made to subnational governments to fight this disease. However, using the figures effectively paid by the date of our data collection, just 38.9% of the sum allocated to the states has been transferred, and the percentage falls to 33.5% in relation to the municipalities. On the federal level, the execution has been just 11.24%. The values are practically identical if calculated based on the sums transferred.

4.3 Process of allocating funds to the states and municipalities

Law 8080 (1990) determines the decentralization in terms of the State's responsibilities expressed in the Federal Constitution, to promote social and economic policies to promote, protect and recover health. That being so, part of the federal funds for financing health actions and services are transferred to subnational entities as co-financing of its actions.

The model for combatting COVID-19 follows the same logic, and this is why the subnational governments are fundamental agents in terms of its operationalization. This is clear from the allocation of resources itself, given that 68.95% of the funds were transferred to states and municipalities, which corresponds to 84.5% of the total transferred. Nonetheless, the reality of the subnational governments is very different, and it is crucial to analyze the adopted allocation rules, defined by the Ministry of Health's ordinances.

As of the middle of June, to meet the requirements of the published provisional measures, the Ministry of Health has issued various norms which define rules for the financial support of actions to fight the COVID-19 outbreak and has created Work Program 10.122.5018.21C0.6500 – Facing the Coronavirus International Public Health Emergency. At this point seven ordinances have been issued, detailed in Table 4, through which financial resources for actions designed to combat the pandemic have been transferred, authorized by provisional measures or a specific law. The resources were sent within the maintenance block, identified by a specific group to accompany these transfers: COVID-19.

Ordinance n. 395 (2020) transferred a total of 424.15 million reais from the Ministry of Health to the State Health Funds (FES). The money was distributed based on the number of inhabitants in each state and, as a rule, R\$ 2.00 per capita. The FNS made the total transfer to the FES, determining that the distribution of the funds on the intrastate level should be agreed upon through Bipartite Inter-managerial Commissions (CIB), considering the respective Contingency Plan. Nonetheless, only the states of Pernambuco, Paraná, Rio de Janeiro and Santa Catarina have transferred part or all of the funds from the ministry to their municipalities. Thus, most of these funds remain in state coffers.

On March 23, 2020 the Ministry of Health published Ordinance n. 480, allotting R\$ 600 million to the states and municipalities. Contrary to the previous document, however, the Ministry of Health defined a new method of distribution. The distribution would be agreed upon once again by the CIB, however, the transfer had to be at least R\$ 2.00 per capita according to the 2018 IBGE population estimates for these municipalities. An important innovation was guaranteeing the transfer of financial resources to the municipalities.

Thus, the ordinance decreed that states which already had transferred funds originating from Ordinance n. 395 (2020) to the municipalities could receive them as long as they came to an agreement in the CIB. In turn, state governments which still had not transferred funds to the municipalities were obliged this time to do so, with the allocation agreed to in the CIB, and also had to prioritize assistance networks with greater potential to face the COVID-19 pandemic. A value between R\$ 2.00 and R\$ 5.00 per capita was also established for the distribution to the municipalities. The Ministry of Health determined a period of 24 hours to formalize the interstate distribution of resources which would be utilized by the FNS to make the transfers. In this second transfer, 68.29% of the assistance from the Ministry of Health was allocated to the municipalities.

In the third ordinance published n. 774 (2020), the distribution methodology was altered. Through this norm, 3,944,360,945.06 reais were allocated to other spheres of government, using as a criterion the transfer of an extra payment to the Basic Attention Floor (PAB) for a group of municipalities, and for another group of municipalities a payment equivalent to 1/12 of the annual Financial Limit of the Hospital and Out-Patient Middle and High Complexity Group, ignoring in this way, the regional inequalities and existing gaps in assistance. Of all of the transferred funds, 66.9% were allocated to the municipalities.

More recently, the emission of Ordinance 827, published on April 15, 2020, included the procedure of complementing the value of a hemodialysis session as well as its financing for patients with suspected or confirmed cases of COVID-19 in the SUS Table of Procedures, Medicine, Ortheses, Protheses, and Special Materials. The payment is made through an Out-Patient Procedure Authorization (APAC) in order to comply with the National Health Supervision Agency (ANVISA) determination providing for this service referring to a single use of dialysis and dialysis machines per session for patients with suspected or confirmed cases of the new coronavirus.

Ordinance n. 430, of March 19, 2020, established federal financial incentives for costing within the environment of Basic Attention to Health from March to September 2020 to support the functioning of the extended hours of the Family Health Units (USF) or Basic Health Units (UBS) in the country.

Meanwhile Ordinance n. 568 (2020) is the basis for making hospital beds available for the Adult and Pediatric Intensive Care Units allocated exclusively to patients with COVID-19. The criteria for their clearance include epidemiological data (patients x beds) and the assistance network available in the states. Since the date of the emission of this ordinance, 8,590 beds have been made available, which are detailed by state in Table 2.

TABLE 2 DISTRIBUTION OF ADDED ICU BEDS FOR COVID-19 AS OF JUNE 12, 2020

UF	STATE		MUNICIPAL		Overall Total of Beds	Approved Funds
	ADULT ICU	PEDIATRIC ICU	ADULT ICU	PEDIATRIC ICU		
AC	30				30	4.320.000,00
AL	61		93		154	22.176.000,00
AM	186	8			194	27.936.000,00
AP	32				32	4.608.000,00
BA	111		147	17	275	39.600.000,00
CE	185	6	186	15	392	56.448.000,00
DF	175	10			185	26.640.000,00
ES	88		77		165	23.760.000,00
GO	20		139		159	22.896.000,00
MA	149		89		238	34.272.000,00
MG	38		365		403	58.032.000,00
MS	15		152		167	24.048.000,00
MT	114	10	124	25	273	39.312.000,00
PA	270	14	52		336	48.384.000,00
PB	84		80	6	170	24.480.000,00
PE	535	15	84	10	644	92.736.000,00
PI	10		241	10	261	37.584.000,00
PR	141		297	35	473	68.112.000,00
RJ	50		585	16	651	93.744.000,00
RN	102	10	44		156	22.464.000,00
RO	53	7	16		76	10.944.000,00
RS	215		404	5	624	89.856.000,00
SC	162		190	20	372	53.568.000,00
SE	40		14		54	7.776.000,00
SP	718		1.342	4	2064	297.216.000,00
TO	36	6			42	6.048.000,00
Total	3,620	86	4,721	163	8,590	1.236.960.000,00

In Brazilian reais.

Source: Elaborated by the authors based on the National Press.

In May 2020 Law 13,995/20 was sanctioned, which allocated through state and municipal funds R\$ 2 billion of auxiliary finance for non-profit Santa Casas and philanthropic hospitals, with the objective of helping them act in a coordinated manner in the fight against COVID-19. The distribution of the funds was realized in two payments through Ordinances 1393 and 1448, published on May 21 and 29, 2020 respectively. It was based on the quantity of beds in the SUS National Registry of Health Establishments as of May 12, 2020 for the Santa Casas and philanthropic hospitals in the Contingency Plans of the states and the Federal District, and those in municipalities possessing presidios, attributing the value to be distributed based proportionately on the number of beds in each establishment.

The other transfers, up until now, have been allocated to proposals approved by congressional amendments, using the criterion of the congressman's destination and the proposed financing presented by states and municipalities in the FNS Objectives and Proposals Management System.

TABLE 3 DISTRIBUTION OF THE RESOURCES APPROVED BY CONGRESSIONAL AMENDMENT TO SUPPORT THE FIGHT AGAINST COVID-19 AS OF JUNE 12

STATE	Valor Pago FAF Estadual	Number of Munic/State receiving covid-19 transfers from Congressional Amendments	Total paid to Municipalities by State	Total by State
AC	28.075.527,00	-		28.075.527,00
AL	3.500.000,00	60	70.244.211,00	73.744.211,00
AM	6.500.000,00	54	110.334.308,00	116.834.308,00
AP	35.457.173,00	14	23.774.304,00	59.231.477,00
BA	54.869.588,00	138	72.035.310,00	126.904.898,00
CE	105.970.421,00	135	74.995.919,00	180.966.340,00
DF	50.437.829,00	-		50.437.829,00
GO	18.607.688,00	158	58.195.820,00	76.803.508,00
MA	43.336.600,00	95	82.239.642,00	125.576.242,00
PB	4.800.000,00	21	10.800.000,00	15.600.000,00
PE	54.921.718,00	31	30.159.782,00	85.081.500,00
RJ		3	97.697.820,00	97.697.820,00
RN	25.316.244,00	22	13.694.130,00	39.010.374,00
RO	30.991.725,00	-		30.991.725,00
RR	27.000.000,00	8	22.014.018,00	49.014.018,00
RS	48.518.312,00	37	15.349.225,00	63.867.537,00
SE	38.650.461,00	2	7.534.650,00	46.185.111,00
SP	152.861.216,00	23	61.438.417,00	214.299.633,00
TO	-	2	2.000.000,00	2.000.000,00
Total	679.376.673,00	804	802.945.385,00	1.482.322.058,00

In Brazilian reais.

Source: Elaborated by the authors based on the FNS (2020).

4.4 Analysis of the Received Funds

An analysis of the distribution of transfers from published ordinances shows that in the state sphere the division of financial resources followed various criteria, most notably population, the presence of an installed network as well as political factors, as can be seen in the congressional amendments. Table 4 summarizes the transfers to state governments and municipalities to fight COVID-19.

TABLE 4 DISTRIBUTION OF FINANCIAL RESOURCES PER PUBLISHED NORM – IN MILLIONS OF BRAZILIAN REAIS

Form of resource distribution	State	Municipality	Total
Congressional amendments	729.81	752.51	1,482.32
Approval of ICU Beds for COVID-19	486.36	586.81	1,073.17
Port. 480	186.96	413.04	600.00
Port. 395	424.15		424.15
Port. 430	0.41	8.33	8.73
Port. 774	1,305.57	2,638.93	3,944.50
Port. 827	12.30	24.43	36.72
Port. 1393 and 1448 /2020	752.77	1,247.23	2,000.00
Overall Total	3,898.34	5,671.26	9,569.59

Source: Elaborated by the authors based on FNS (2020).

To infer the impact of this institutional design, we used a regression for the entire transfer received by each municipality updated as of June 12, 2020, whose data is available at FNS/MS, together with socioeconomic and geographical factors, using the ordinary least square method with robust estimators (Greene, 2002). For this, we employed the specification defined in Equation 1.

TABLE 5 DESCRIPTIVE STATISTICS

Variable	N.	Average	Min.	Max.
Transf. Rec. by Mun.	5568	R\$ 1,012,714	R\$ 1,041	R\$ 278,761,609
Per Capita Health Spending	5564	R\$ 889	R\$ 0	R\$ 5,562
Population Density	5566	126	4	25.977
Population	5501	37,167	812	12,106,920
Municipal GDP	5561	R\$ 1,168,620	R\$ 12,992	R\$ 699,288,352
Beds	5570	55.16	0	15,502
ICU Beds	5570	3.89	0	1,906
Capital	5570	0.00	0	1
Infant Mortality	5570	12.26	9.9	19.60
Dist. Brasília (in Km)	5507	1,076	0.75	2,868
Dist. Capital (in Km)	5507	253	0	1,476

Sources: IBGE (2020), FNS (2020), CNESS (2020), and FINBRA (2020).

Table 5 displays the principal statistics for the utilized variables. All of the data was obtained from the National Treasury Database, FNS, CNES, and IBGE. The city of São Paulo was the municipality which received the largest transfer, equivalent to R\$ 278,761,608.69, followed by Belo Horizonte, with R\$ 168,920,165.01, and Fortaleza, with R\$ 111,806,582.03. In turn, Quixaba, PE, which received just R\$ 1,041.43, Bora, SP which received R\$ 2,415.73, and Engenho Velho, RS, which received R\$ 2.614.18, were the three cities which have received the fewest financial resources to combat COVID-19. Approximately 1,443 municipalities received a maximum of R\$50,000.00. The largest per capita health spending in Brazil was registered in Santa Maria, RS with R\$ 5,561.87 per capita, and the smallest was Alvinópolis, with less than R\$ 1.00 per inhabitant. The other variables follow a pattern of great heterogeneity in Brazil.

TABLE 6 RESULTS

	Transf. Received to Combat COVID-19				
Log Health Spend PC	-0.503 [-8.893]***	-0.359 [-9.515]***			-0.071 [-1.967]*
Log ICU Beds		0.551 [29.688]***			0.306 [14.345]***
Log Beds		0.496 [52.022]***			0.221 [21.169]***
Log Pop. Density			0.187 [9.352]***		-0.011 [-0.796]
Log. Dist. Brasília (in Km)			0.202 [6.252]***		-0.048 [-2.415]*
Log Dist. Capital (in Km)			-0.244 [-7.299]***		0.015 [0.873]
Log Population				0.250 [11.930]***	0.203 [8.658]***
Log GDP				0.787 [42.980]***	0.497 [25.331]***
Log Infant Mortality				3.118 [30.660]***	2.509 [21.837]***
Capital				0.440 [1.630]*	-0.589 [-2.322]*
Constant	15,248 [40.373]***	13,024 [50.727]***	11,156 [52.994]***	-7,969 [-26.360]***	-2,233 [-4.409]***
R ²	0.014	0.559	0.064	0.629	0.675
Observations	5563	5563	5559	5495	5485

Obs. 1: t-values in the parentheses.

Obs. 2: # p<0.1; * p<0.05; ** p<0.01; *** p<0.

Source: Elaborated by the authors.

Table 6 presents the results. The first model shows that municipalities with lower health spending per capita received larger transfers. In the last model with all of the controls, for every 1% fall in health spending per capita, the municipality received 0.071% larger transfers. However, the average absolute value transferred was relatively small.

Nonetheless, when we take into account the number of beds and intensive care units, we can infer a strong positive correlation. In fact, the approval of beds was an important form of distributing financial resources and this is clearly captured in the second model. This result remains when we add all of the controls. Or in other words, within the pre-existing structure the transfers were concentrated precisely in locations where there are hospitals with beds, especially ICU beds. In this way, it should be remembered that Ordinance n. 568 (2020) was based on the criterion that Adult and Pediatric Intensive Care Unit beds had been approved.

Municipalities with greater population density, or those closer to Brasilia or their respective capitals did not receive more financial resources. Despite the fact that the third model indicates this result, its statistical significance is rejected when more controls are introduced. As a result, epidemiological variables based on the disease's characteristics which potentially could contain the expansion of the disease through prevention were eclipsed by indicators related to the increase in the capacity to treat COVID-19 (Anderson et al., 2020; Feng et al., 2020; Grasselli et al., 2020; Wang et al., 2020)

In turn, municipalities with greater population received greater transfers. The influence of municipal GDP was especially relevant, being statistically significant in all of the models: richer municipalities received larger transfers. It is important to point out that inequality was not incorporated in the model, in which richer cities may be more unequal and possess a larger vulnerable population. In relation to this, municipalities with higher indices of infant mortality received larger transfers. Effectively, with each 1% growth in infant mortality, municipalities received 2.51% more in transfers.

To conclude, the analysis results indicate that the SUS financing model was not modified due to the needs of confronting COVID-19, with the preexisting unequal logic and political bias prevailing (Baptista et al., 2012; Battesini, Andrade, & Seta, 2017; Piola et al., 2016; Santos 2018).

5. CONCLUSION

Facing COVID-19 has been the greatest challenge to the Brazilian health system in decades. However, unlike the experiences of Italy and Spain, the underfinancing of public health services has remained unchanged. Total spending on public health in Brazil has grown relatively little in real terms, with the per capita transfers to Brazilian municipalities being relatively small.

Considering the already published ordinances, the approval of ICU beds and incentives to increase USF hours have demonstrated the prioritization of Basic and Specialized Attention. The other ordinances provided financial support to public health actions and services in general to face the COVID-19 pandemic, permitting greater freedom of action for subnational entities despite existing impediments due to spending categories. Thus, making funding more general together with the recharacterization of the financing blocks increased the autonomy of local management to meet existing demands.

In terms of the distribution of resources, the coordination and form of their allocation still requires improvement. Up until now, most of the distributed financial resources have come from Ordinance

n. 774 (2020), with distortions in the allocation to municipalities in terms of the established criteria. Congressional amendments have also been very relevant, even though a considerable portion of the municipalities have not received funds which have been eminently political. In sum, the logic of financing has caused great inequality in the destination of these financial resources used to combat COVID-19. The approval of more ICU beds has increased the installed capacity in various regions; however, considering the evolution of cases in some locations, these beds have not been able to meet total demand.

An important limitation to this study is the unprecedented nature of the pandemic. Few studies examine the apprehension of the financing needs of health services when there is a strong increase in demand. In addition, the disease is still a new phenomenon, whose effects will be felt by SUS for some time. In this manner, new studies need to be made evaluating the measures taken relative to data that has not yet been collected.

Nevertheless, in the case of Brazil, the new meets the old, according to the recurrence of issues already noted in the literature on the financing of SUS, within the federal pact. In summary, the SUS financing model was not modified by the needs of facing the COVID-19 pandemic. Therefore, the preexisting unequal logic and political bias documented in the literature (Baptista et al., 2012; Battesini, Andrade, & Seta, 2017; Piola et al., 2016; Santos, 2018) has continued. This is an important result, because despite the size of the crisis imposed by the pandemic, there has not been a qualitative change in the design of financing rules, which has intensified the problems of underfinancing.

It is true that there were adjustments to the rules applied to the financing blocks to permit more agility in adjusting the structure needed to face the disease and free up financial resources. However, compared to the measures taken by other countries, which were strongly coordinated, the actions of Brazil appear to be insufficient in the face of this challenge to society.

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Gustavo Andrey de Almeida Lopes Fernandes



<https://orcid.org/0000-0001-8281-390X>

Ph.D. in Economics at University of São Paulo (USP); Professor from São Paulo School of Business Administration at Fundação Getulio Vargas (FGV EAESP). E-mail: gustavo.fernandes@fgv.br

Blenda Leite Saturnino Pereira



<https://orcid.org/0000-0002-7831-0258>

Ph.D. student in Public Health from Public Health Faculty at University of São Paulo (USP). E-mail: blendapereira@usp.br