

The resilience of large Brazilian cities and the COVID-19 pandemic

A resiliência das grandes cidades brasileiras e a pandemia da Covid-19

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ABSTRACT This paper aimed to describe the resilience of the Federal Government's fund of Public Health Actions and Services (ASPS) in Brazil during the 2020 COVID-19 pandemic. It shows that the development of the contemporary public health sector was based on cooperative federalism. In this context, municipal participation in financing was consolidated around the constitutional agreement of budget binding between the levels of the Brazilian federation (Central Government, states, and municipalities). The Budget Binding Index (BBI) and the resilience of the sample of 87 municipalities with a high budget are described from the Public Health Budget Information System (SIOPS) indicators, available at DataSUS/Ministry of Health. The paper shows that the central government withdrew its support for increased ASPS expenditure in the last decade, stabilizing the allocation of its resources through the veto on budget binding. The change in federal orientation shifted the burden of expanding financing to municipal and state governments. The paper concludes that the increase in municipal expenditures offset the stabilization of federal expenditures. Budget binding was crucial to the resilience of ASPS funding in most municipalities in the sample during the first cycle of the COVID-19 pandemic.

KEYWORDS Health financing. Budget binding index. Federalism. COVID-19. Resilience.

RESUMO O objetivo do artigo foi descrever a resiliência do gasto governamental com Ações e Serviços Públicos de Saúde (ASPS) no Brasil durante a pandemia da Covid-19 em 2020. Demonstra-se que o desenvolvimento do setor público de saúde contemporâneo foi baseado no federalismo cooperativo. Nesse contexto, a participação municipal no financiamento foi consolidada em torno do pacto da vinculação orçamentária entre os níveis da federação (governo central, estados e municípios). Com base nos indicadores do Sistema de Informação sobre Orçamento Público de Saúde (Siops)/DataSUS/Ministério da Saúde, descrevem-se o Índice de Vinculação Orçamentária e a resiliência da amostra de 87 municípios com elevada disponibilidade orçamentária. Expõe-se que o governo central retirou o apoio à expansão das despesas com ASPS, estabilizando a alocação de seus recursos por meio do veto à vinculação orçamentária. A mudança de orientação federal transferiu o ônus da expansão do financiamento aos governos municipais e estaduais nas últimas décadas. Conclui-se que a estabilização das despesas federais foi compensada pelo crescimento da vinculação do orçamento municipal com as ASPS. Durante o primeiro ciclo da pandemia da Covid-19, a vinculação orçamentária foi crucial para a expansão do financiamento das ASPS na maioria dos municípios da amostra, possibilitando a condição resiliente.

PALAVRAS-CHAVE Financiamento da saúde. Índice de Vinculação Orçamentária. Federalismo. Covid-19. Resiliência.

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Introduction

This paper aims to analyze the expenditure resilience in large cities with Public Health Actions and Services (ASPS) during the 2020 COVID-19 pandemic in Brazil when the country was one of the most affected by the spread of SARS-CoV-2¹. Brazilian cities had to take the lead in implementing social distancing and health care measures² due to the denialism of the central government led by President Bolsonaro.

The ongoing pandemic is a severe event that overwhelms health systems worldwide, requiring increased national spending³. In this setting, the analysis of resilience in ASPS financing allows identifying the Federal Government's capacity to respond to the unexpected shock caused by the pandemic, maintaining or increasing the health care activities of the Unified Health System (SUS). As pointed out in the literature, the role of Brazilian cities in financing ASPS has grown significantly in the last two decades.

We should underscore the complex institutional arrangement that paved the way for the participation of Brazilian cities in the ASPS financing. At the onset of re-democratization, part of the resources controlled by the central government was transferred, in the decade, to the direct implementation of state and municipal governments in exchange for the acceptance of a standardized agenda of health policies and programs⁴. Sectoral financing was organized around an ingenious system of conditional resource transfers, associated with levels of agreement between managers at the three levels of government in the 1990s⁵. The institutionalization of the mandatory fund-to-fund transfer mechanism convinced state and local to accept the federal programmatic agenda for the SUS^{6,7}.

The publication of ordinances by the Ministry of Health (MS) was the main administrative instrument that facilitated the coordination of national public health

actions in the federation. Therefore, the decentralized health policy implementation costs were derived from the exercise of the Federal Government's financial, administrative, and regulatory authority^{8,9}. The Family Health Strategy, the mental health reform, and the oral health policy are paradigmatic examples of the central government's consensual acceptance of policy initiatives.

Viana¹⁰ lists two reasons for the sustainable success of the Federal Government's inductive agenda: i) the 1988 Federal Constitution gives the Federal Government the exclusive competence to create and collect social contributions, sources of revenue earmarked to social security; ii) the delayed SUS decentralization, which contributed for states and municipalities to commit their revenues from the tax sharing established in 1988 with other priorities.

The Federal Government's induction was particularly successful with the budget binding agreement formalized by Constitutional Amendment n° 29, of 2000 (EC 29), to the 1988 Federal Constitution. EC 29 is a critical event in the Brazilian public health sector's decentralization trajectory. Its approval politically resolved the dilemmas of federative cooperation in the ASPS financing by establishing the participation of states and municipalities in public health spending, inaugurating the second stage of the ASPS federative decentralization process.

EC 29 modified arts. 167, item IV, and 198 of the Federal Constitution and linked minimum percentages of tax revenues within the competence of states and municipalities to the ASPS (respectively, 12% and 15% of net revenues from 2004 onwards). As of 2001, it also proposed adjusting the values used by the Federal Government by the variation of the Gross Domestic Product (GDP)¹¹.

The regulation of EC 29 was only concluded after a long negotiation of 12 years in the National Congress, by Complementary Law n° 141, in 2012 (LC 141/2012). Barros

and Piola¹² state that LC 141/2012 resolved several disputes. However, it did not incorporate the proposal to increase federal participation in financing the public system. The Federal Government's participation was expected to be based, as in the case of states, the Federal District, and municipalities, on the equivalent of 10% of current gross revenue. According to Piola et al.¹¹, this device would add R\$ 40 billion a year to the federal funding of the SUS, and the annual adjustment would be based on the evolution of current gross revenue. The proposal was vetoed in LC 141.

In this sense, in the 2013-2014 biennium, the Saúde+10 movement submitted the Popular Initiative Bill n° 321 (PLC 321/2013) to the National Congress with more than 2.2 million signatures audited in favor of the minimum application of 10% of the current gross revenue of the Federal Government in ASPS. However, almost all the Representatives and Senators of the National Congress were against the proposal (with the support of the Federal Government) and approved the Constitutional Amendment n° 86/2015 (EC 86)¹³.

Known as the Constitutional Amendment of the 'imposed budget', EC 86/2015 amended paragraphs and items in arts. 165 and 166 of the Constitution, regarding the binding of resources to implement individual parliamentary amendments and amended art. 198 of the Federal Constitution to establish 15% of the Federal Government's current net revenue for health programs and actions¹³.

It established the application of not less than 15% of the Federal Government's current net revenue for the fiscal year (art. 198, § 2, item I). Moreover, the percentage of 15% established would be reached gradually: 13.2% in 2016, 13.7% in 2017, 14.1% in 2018, and 14.5% in 2019. The proportion of 15% of net current revenue in health actions and services would only be fully applied in 2020 (art. 2 of EC 86)¹⁴. The injunction of

the Minister of the Federal Supreme Court Ricardo Lewandowski anticipated the application of the 15% to 2018¹⁵.

The amounts collected from oil royalties and the portion of parliamentary amendments destined for health actions and services were included to calculate this amount. The minimum constitutional percentages for municipalities and states remained as provided in EC 29/2000 (15% and 12% of own revenues, respectively)¹³.

The stabilization of its ASPS expenditure against GDP in the past decade is a direct consequence of the Federal Executive's veto of budgetary binding, reflected in legal and constitutional advances and setbacks. Federal ASPS expenditure fluctuated around two percentage points of GDP in the 2010-2019 period¹⁶. On the other hand, the acceptance of budgetary binding by municipalities supported the continuous and sustained growth in the allocation of resources to health in the decade¹².

In the context of the weakened agreement through budget binding obtained in EC 29, we highlight that the decision to reduce the Federal Government's primary expenditure by Constitutional Amendment No. 95 of the spending cap limit in 2016 (EC 95) was a particularly severe break in the federative agreement for public funding of the ASPS. The new tax regime contained in EC 95 established a spending cap limit for the Federal Government's primary expenditures without defining a limit for financial expenses. As Santos and Vieira¹⁷ warn, central government primary expenditure could be frozen in real terms at approximately BRL 1.3 trillion due to the annual adjustment for inflation from 2017 to 2036. Health and Education expenditure effectively lost the binding to revenues, and their minimum investments were frozen in the same terms as primary expenditure; however, they were only valid as of 2018. Therefore, the pandemic that broke out in 2020 found the Federal Government exiting the normative and inducing role of SUS development.

However, it should be noted that, given the emergency, the Federal Government had to accept, under pressure from the federal legislature, a fiscal effort to address the unforeseen effects of the imposition by local and regional governments of social distancing to control the spread of the new Coronavirus¹⁸.

The public disaster decree and the Proposed Amendment to the Constitution (PEC) of the war budget suspended the spending cap established by EC 95 temporarily¹⁹. Moreover, the declaration of a state disaster authorized the allocation of extraordinary resources not accounted for in the spending cap. With the decision, in 2020, the MS received the approval of additional funds to face the pandemic, amounting to R\$ 49.9 billion¹⁵. These decisions forced the postponed implementation of the new regressive tax regime in the country provided in EC 95.

Study design

The concept of resilience is commonly used to analyze the individual adaptive response to loss or a traumatic event, maintaining a certain positivity in emotional condition and social functionality²⁰. In public policy analysis, the description of resilience emphasizes the reactive behavior of individuals and organizations before disasters or catastrophic events²¹.

Public sector economic resilience is geared to measuring financial resource changes during and after a critical event. According to Rose²², one of the methodological challenges in the analysis of economic resilience is the identification of resilient action at the conceptual level; at the operational level, the difficulty lies in identifying the expected behavior of individuals, groups, or communities in a contextual arrangement; and it is challenging to gather data to show the resilience concept's operability at the empirical level.

The federative agreement for maintaining funding for the ASPS in Brazil undoubtedly offers ideal conditions to identify resilient action (a binding decision), operated by groups of municipalities and evidenced by standardized indicators of expenditures.

The paper analyzes the behavior of binding municipal resources to the ASPS in the 2008-2020 period to understand the resilient effect of the sectoral financing decision in the pandemic. The notion of municipal resources includes revenues from royalties, tax on services of any kind, urban land, property tax, and tax on the transfer of immovable property. Resources from the Municipal Participation Fund and transfers to ASPS are not included in the calculation of municipal revenues.

The description of the pattern of financing resilience in large cities is based on panel data from the sample of 87 municipalities with complete information in the Public Health Budget Information System (SIOPS) in the 2008-2020 period. The sample includes 96% of Brazilian municipalities with a reported budget revenue above R\$1 billion in 2019²³.

The essential feature of panel data is that the same units are compared at two points in time²⁴. Therefore, the research design with panel data allows analyzing the resilience of the same set of large cities at two critical moments – in the years before the pandemic and in 2020, when local governments were addressing the pandemic still without the availability of the pharmacological option of vaccination.

The Municipal Budget Binding Index (BBI) is calculated from the observed values of the budget binding of own revenues, derived from the equation $IVM = \frac{Vo_t - Ve_{min}}{Vt_{max} - Vt_{min}}$. In the equation, Vo_t represents the observed value of the percentage of own resources invested in ASPS at a point in time, as defined in EC 29; and Vt_{max} and Vt_{min} are, respectively, the minimum values of the percentage of

own resources invested in ASPS as defined in EC29 for the municipal level in a given year (t). The BBI value ranges from 0 to 100 and informs that ASPS funding is a priority on the municipal government's agenda when close to the maximum value. The BBI modeling is based on the ideas developed by Pereira et al.²⁵.

The paper also assumes that the positive variation in the 2020 BBI value, compared to the mean value observed in the 2018-2019 period, indicates that the municipality was resilient (R) in the ASPS financing during the COVID-19 pandemic. ($R = IVM_{020} - IVM_{2018-2019} > 1$). The paper also correlates the resilience condition (R) of the cities in 2020 with the SIOPS variables of the same year:

- Population size.
- Regional location.
- The scale of dependence on transfers from another sphere.
- The scales the share of specific transfers for health from the Federal Government against the Federal Government's total transfers.
- The scale of own resources applied to health per the EC 29.

The description through the correlation coefficient r of these SIOPS variables proposes identifying the degree of association of resilience with the structural variables of the sample of large cities. The indication that there is a correlation or not between the selected variables is the correlation coefficient, which assumes values between -1 and

+1. The higher the value of this coefficient, regardless of whether it assumes a positive or negative value, the greater the degree of linear association between the variables²⁶. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) 24.0.

Results

The cities in the sample were large (all with a population of over 100 thousand inhabitants) and located – most of them (52%) – in the Southeast region. The capital statute included 29% of billionaire municipalities. The sample totaled 1.5% of Brazilian cities and concentrated 35% of the population residing in the country.

According to *table 1*, the most significant differences in the sample indicators were in the size of the population, the share of transfers linked to the health of the Federal Government and states, and the BBI. The mean BBI was 44.73 in 2020, with significant variability among the municipalities in the sample (42%).

On the other hand, the high relative share of the Federal Government in the resources transferred to health (mean of 89.5%) had a lower coefficient of variability in the sample. We should underscore the low percentage of states' share in transfers from federal entities to the municipalities studied for the ASPS (mean of 10.5%).

The discrepant situation of dependence on tax revenue transfers from another federal sphere was exceptionally high in the sample studied, ranging from 31.5% to 82%. *Table 1*²⁷ shows, above all, that the billionaire municipalities were distributed in two quite different groups in terms of dependence on central government transfers.

Table 1. Characteristics of billionaire municipalities – 2020 (n=87)

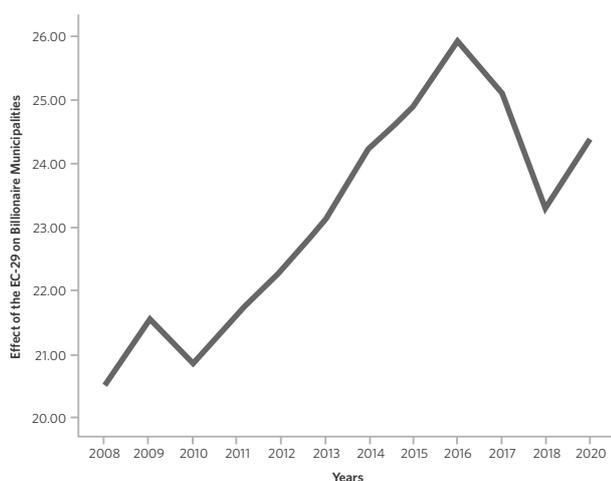
| Descriptor | Mean | Variation | | |
|---|---------|-----------------|---------|------------|
| | | Coefficient (%) | Minimum | Maximum |
| Population | 865,248 | 174 | 130,705 | 12,252,023 |
| Collection capacity (%) | 25.02 | 37 | 10.43 | 55.55 |
| Degree of dependence on transfers from another sphere (%) | 54.67 | 20 | 31.47 | 81.98 |
| Share of transfer revenue earmarked to health (%) | 20.86 | 50 | 4.04 | 46.35 |
| Federal Government's share in resources transferred to health (%) | 89.43 | 10 | 58.84 | 100 |
| Share of specific Federal Government's transfers to health against Federal Government's total transfers (%) | 44.32 | 37 | 5.71 | 75.52 |
| Share of tax revenue and constitutional and legal transfers in the municipality's total revenue (deductions excluded) (%) | 52.48 | 18 | 30.78 | 74.24 |
| Share of transfers to health against the municipality's total health expenditure (%) | 44.67 | 38 | 11.25 | 92.40 |
| Own resources invested with health (%) according to EC29 | 25.14 | 23 | 11.30 | 42.24 |
| Budget Binding Index (BBI) | 44.73 | 42 | 0.0 | 100 |

Source: Siops/DataSUS²⁷.

According to what was observed for the municipalities nationally, binding own revenues to ASPS after the EC 29 was implemented had a notable evolution between 2008 and 2016, as shown in *graph 1*²⁷. We also observe in *graph 1* that the veto to binding the federal budget to SUS financing,

explained in EC 95, directly affected the expansive bias of the allocation of municipal resources to the ASPS in recent years, reversing the development of budget binding. The 2017-2018 biennium registered a significant reversal of the allocation of municipal resources to health.

Graph 1. Impact of Constitutional Amendment No. 29 of earmarking own revenues in public health actions and services in billionaire municipalities – 2008-2020 (n=87) (%)

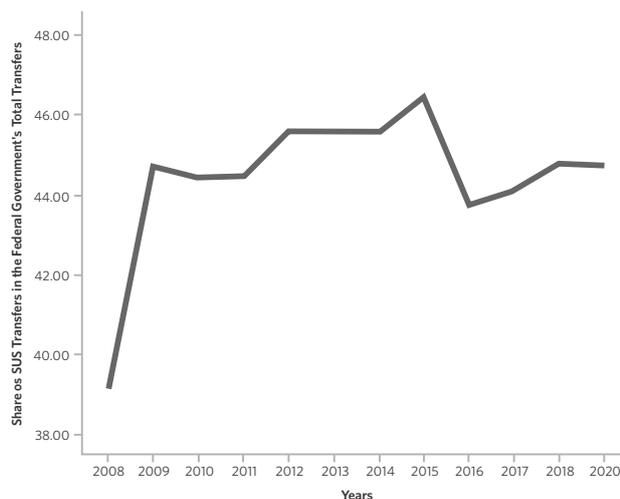


Source: Public Health Budget Information System (SIOPS)/DataSUS/Ministry of Health²⁷.

In this sense, it is worth highlighting the trend toward stabilizing transfers of federal resources to the ASPS, between 2008 and 2019, in the sample studied, observed in *graph 2*²⁷. The Public Disaster Decree or the 2020 PEC of the war budget did not reverse this trend. Paradoxically, the extraordinary resources arising from the need for national management of the COVID-19 pandemic did not exceed the peak of federal transfers to billionaire municipalities observed in

2015, nor did they exceed the allocation of federal resources to the ASPS in 2019. In this context, Servo et al. show that, although the war budget was approved and there were resources in the budget to fight the pandemic, the Federal Government did not commit to implement and allocate them at the necessary pace in a public health emergency, harming actions to combat the pandemic in the three government spheres²⁸.

Graph 2. Percentage of federal transfers to public health actions and services in billionaire municipalities - 2008-2020 (n=87)



Source: Public Health Budget Information System (SIOPS)/DataSUS/Ministry of Health²⁷.

*Table 2*²⁷ shows that the resilience of municipal funding was independent of the municipality's structural conditions (regional location, population size, fiscal dependence, or adherence to EC 29).

The conditioning factor of resilience in most of the sample of billionaire cities in 2020 was the lower share of transfers from the Federal Government to health against

the total expenditure of federal transfers to the municipality in that same year. In other words, resilient municipalities, which increased their resources for ASPS, received proportionally fewer resources from the Federal Government during the health emergency produced by the new Coronavirus compared to non-resilient ones.

Table 2. Resilience and variation in the Budget Binding Index (BBI) in 2017-2019 and 2020 in billionaire municipalities (n=87)

| Resilience/BEI | BEI in 2020 | BEI Mean | 2018-2019 | Variation (A-B) |
|---|-------------|----------|-----------|-----------------|
| Non-resilient municipalities - 34 (39%) | 40.0 | | 41.2 | -1.2 |
| Resilient municipalities - 53 (61%) | 44.7 | | 36.1 | +8.6 |

Source: Siops/DataSUS²⁷.

As shown in *table 3*, the weak shared participation of federal funding observed in 2020 may explain the high proportion (61%) of billionaire municipalities resilient in the ASPS financing during the pandemic and substantially expanded budget binding.

*Table 3*²⁹ also shows that the BBI in the set

of resilient municipalities was significantly expanded by 8.6 points in 2020 against the mean for the 2018-2019 biennium. On the other hand, the BBI declined slightly by -1.32 points in the 34 non-resilient municipalities in 2020 against the mean for the 2018-2019 biennium.

Table 3. Health expenditure sources in Brazil. 2003 and 2017 (in US\$ per purchasing power parity per capita)

| Per capita health expenditure (US\$ PPP) | 2003 | 2017 |
|--|------------|--------------|
| Federal Government | 168 (21%) | 267 (18%) |
| States | 88 (11%) | 163 (11%) |
| Municipalities | 88 (11%) | 193 (13%) |
| Private | 454 (57%) | 860 (58%) |
| Total | 798 (100%) | 1,482 (100%) |

Source: Marques; Piola; Roa²⁹.

In this context, we should underscore the residual role of municipal control over the allocation of resources in the Brazilian health sector over the last few decades, despite the cooperative federalism endeavors. The allocation of resources by the private sector (households and health insurance companies) and the central government is still dominant in Brazil. Despite the monumental efforts to expand own expenditures through budget binding, the resources allocated directly by Brazilian municipalities covered 13% of the total

available by the health sector in 2017. The private health care plan sector and direct disbursement allocated 58%¹².

Conclusions

This paper confirms the resilience of municipalities against the shock of the pandemic in the setting of cooperative federalism vis-à-vis the strict fiscal austerity agenda in the Brazilian central government³⁰. The expanded allocation of resources to the ASPS in a severe

health crisis in billionaire municipalities authorizes a review of skepticism about the experience of decentralization in the Brazilian context.

The first pessimistic view to be reviewed identifies regional disparities as the main hurdle to a successful decentralization. These disparities would refute the hypothesis that a virtuous circle of public policy can be triggered by decentralization. Through this thesis, most municipalities cannot expand tax collection and finance any activity beyond remunerating public servants and implementing activities related to the provision of health and education services with the transferred resources.

On the other hand, the second skeptical perspective associates the binding of revenues with inefficient allocation of public resources because this constitutional restriction hinders elected mayors from defining their priorities according to the party agenda. Budget binding would also promote the capture of resources by corporate interest groups, consolidating the binding of public resources and producing collective discomfort.

The BBI and the resilience of billionaire municipalities reveal a less bleak backdrop for the experience of decentralization in cooperative federalism than anticipated in the literature. We could affirm that the successful process of learning and building consensus in the SUS decentralization contributed to the municipalities committing substantial portions of their revenues to the ASPS from the tax sharing established in 1988, placing the health agenda at the center of decisions of the local governments. Fiscal opportunism and the supposed lack of flexibility of local government did not

compromise the engagement of billionaire cities with the health sector in the analyzed period. The binding implemented by EC 29/2000 ensured the expansion of resources allocated to the SUS in most of the most affluent cities, enabling the involvement of the local government with the unexpected tasks of facing the COVID-19 pandemic.

This paper shows that the only possible cause of the weakened municipal commitment to health is associated with the Federal Government's adherence to the fiscal austerity policy in recent years. The central government's rupture of the budget binding agreement through the spending cap influenced the reduced allocation of resources of billionaire municipalities to the ASPS due to the change in the expectation inaugurated by the EC 29. Notwithstanding this, the veto of budget binding promoted by EC 95/2016 did not collapse the public health sector funding in the pandemic in 2020 for some large municipalities. On the contrary, the paper shows that the effect of the federal Executive's retreat was mitigated due to the resilience of most billionaire cities in expanding health sector financing. It remains to be seen whether the municipal effort was enough to counterbalance the erratic behavior of the Bolsonaro government concerning the COVID-19 pandemic. Unfortunately, the accumulated loss of lives due to the pandemic in Brazil proves that it is not.

Collaborator

Costa NR (0000-0002-8360-4832)* is responsible for elaborating the manuscript. ■

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