

Primary health care performance according to clusters of convergent municipalities in the state of São Paulo

Desempenho da atenção primária à saúde, segundo clusters de municípios convergentes no estado de São Paulo

Raimundo Valdemy Borges Pinheiro Junior^{||} , Nivaldo Carneiro Junior^{||} , Arnaldo Sala^{||} , Carla Gianna Luppi[|] , Mariana Cabral Schweitzer[|] , Marta Campagnoni Andrade^{||} , Edson Rufino^{||} , Lissandra Zanovelo Fogaça[|] , Oziris Simões^{||} , Gabriela Arantes Wagner[|] 

ABSTRACT: *Objective:* To describe the performance of Primary Health Care, according to conglomerates of São Paulo cities that present homogeneous indicators. *Methods:* This is a descriptive study, based on secondary data extracted from official sources of the Unified Health System, for the year 2018. An analysis matrix was created, with the proposition of performance (access, effectiveness and adequacy) and context indicators (population, health determinants and financing) selected and organized in dimensions and sub-dimensions. Cluster Analysis was used to identify the groups of homogeneous municipalities. *Results:* 645 municipalities were divided in 6 conglomerates. Clusters 2 and 3 were formed predominantly by small municipalities with greater access to health; cluster 3 has less social vulnerability and greater investment in health. Clusters 1, 4 and 5 were formed by the largest municipalities with less access to health; cluster 4 presents greater social vulnerability, less coverage of private health plans and a greater percentage of health resources; cluster 5 was characterized by greater Gross Domestic Product per capita and greater coverage of private health plans. Cluster 6, formed by the city of São Paulo, was a particular case. Cluster 2 drew attention, as it was shown to have increased coverage, but signaled lower efficacy and adequacy levels. Cluster 3 had the best performance among all clusters. *Conclusion:* These findings can support regional and municipal management, given the complexity of the territory of São Paulo, pointing to scenarios that demand broader public management initiatives.

Keywords: Primary health care. Health status indicators. Outcome and process assessment, health care. Cluster analyses.

^{||}Universidade Federal de São Paulo, Department of Preventive Medicine – São Paulo (SP), Brazil.

[|]Faculdade de Ciências Médicas da Santa Casa de São Paulo, Department of Public Health – São Paulo (SP), Brazil.

^{||}São Paulo State Health Department – São Paulo (SP), Brazil.

Corresponding author: Raimundo Valdemy Borges Pinheiro Junior. Rua Botucatu, 740, 4º andar, Vila Clementino, CEP: 04023-062, São Paulo (SP), Brasil. E-mail: raimundo.junior@unifesp.br.

Conflict of interests: nothing to declare – **Financial support:** Research Support Foundation of the State of São Paulo (Fapesp Processes 2019/03961-8 e 2020/02394-0).

RESUMO: *Objetivo:* Descrever o desempenho da atenção primária à saúde, segundo *clusters* de municípios paulistas que apresentaram indicadores homogêneos. *Métodos:* Trata-se de um estudo descritivo, com base em dados secundários extraídos de fontes oficiais do Sistema Único de Saúde, referentes ao ano de 2018. Foi elaborada uma matriz de análise, com a proposição de indicadores de desempenho (acesso, efetividade e adequação) e contexto (população, determinantes de saúde e financiamento), selecionados e organizados em dimensões e subdimensões. Para identificar os grupos de municípios homogêneos, foi utilizada a análise de *cluster*. *Resultados:* Dos 645 municípios, constituíram-se seis *clusters*. Os *clusters* 2 e 3 foram formados, predominantemente, por municípios pequenos e com maior acesso; entre eles, o *cluster* 3 apresentou menor vulnerabilidade social e maior investimento em saúde. Os *clusters* 1, 4 e 5, em contrapartida, foram formados por municípios maiores e com menor acesso; entre eles, o *cluster* 4 apresentou maior vulnerabilidade social, menor cobertura de planos privados de saúde e maior percentual de recursos utilizados em saúde; e o *cluster* 5, maior produto interno bruto *per capita* e maior cobertura de planos privados de saúde. O *cluster* 6, formado pelo município de São Paulo, demonstrou ser um caso particular. Ainda, o *cluster* 2 chamou atenção. Apresentando maior cobertura, sinalizou menor efetividade e adequação. Entre todos os *clusters*, o *cluster* 3 alcançou o melhor desempenho. *Conclusão:* Os resultados podem subsidiar a gestão regional e municipal, diante da complexidade do território paulista, apontando para cenários que demandam maiores iniciativas de gestão pública.

Palavras-chave: Atenção primária à saúde. Indicadores básicos de saúde. Avaliação de processos e resultados em cuidados de saúde. Análise por conglomerados.

INTRODUCTION

The effort to build primary health care (PHC) over almost three decades of the Unified Health System (SUS) requires permanent evaluation and monitoring (E&M) not only of specific processes, but as a whole, in a managerial effort to obtain desirable effects on people's health. During this period, the participation of different spheres of government — federal, state and municipal — in running the SUS (Law No. 8080, of September 19, 1990), as well as in the constitution of a National Primary Care Policy (PNAB) (Ordinance No. 648, of March 28, 2006) revised in 2011 (Ordinance No. 2,488, of October 2011) and in 2017 (Ordinance No. 2,436, of September 21, 2017), established the Family Health Strategy (FHS) as a means to expand and consolidate PHC across the Brazilian territory¹.

With regard to the process of expanding municipal responsibilities in the operation of PHC (decentralization) and despite advances made by and for the SUS, such as the Program “More Physicians” (“Mais Médicos”) and the National Program for Improving Access and Quality of Primary Care², the structural inequality and the heterogeneity of offer, quality and resolution potential of services point to challenges towards territorial equity and the integral attention to the population's health³. The most recent change in the federal funding model of PHC is one of the challenges with individualizing approach, being carried out according to criteria such as weighted capitation and payment for performance^{4,5}.

In the state of São Paulo, the federative unit with the largest estimated population (22% of the country's total) and the greatest wealth produced in Brazil in 2019^{6,7}, PHC services are distributed across 645 municipalities. The process of expansion of the FHS in the state, which already had an extensive network of health centers at the time of creation of SUS, was slower when compared to other regions of the country. Between 2000 and 2009, however, a significant expansion of the FHS (from 6.31 to 27.96%) took place, being more consistent in municipalities with smaller populations⁸. Until May 2020, the state of São Paulo still had low coverage percentages both for the FHS model (41.48%) and the technological arrangements of PHC (60.19%)⁹.

In this scenario, the E&M of health services' performance characterizes the methodological need to stratify complex realities and base the planning of collective actions in the review and reorientation of PHC^{10,11}. From a multidimensional approach to health indicators, Viacava et al. (2004) presented the Health System Performance Assessment Project (Proadess)¹², where performance was strongly associated with the structure of the system, having the political, social, economic and structural context as dimensions of analysis and considering equity as a transversal feature¹³. Cluster analysis, a rapid and economical sampling methodology, enables the characterization of homogeneous clusters, which helps to identify critical areas, groups of greater health needs and evidence-based practice (decision making)¹⁴.

Although the literature describes E&M of performance (access, effectiveness and adequacy) proposed by Proadess^{15,16}, there are still gaps when it comes to addressing the municipal and regional context of the state of São Paulo. Given the possibility of building health indicators and methodologies that address collective needs to a certain extent, the objective of this study was, therefore, to describe the performance of PHC according to clusters of municipalities in São Paulo that presented homogeneous indicators.

METHODS

STUDY TYPE AND POPULATION

This is a descriptive study based on secondary quantitative data, publicly accessible and obtained from the Health Information Systems (SIS) of SUS, on the performance of PHC in the state of São Paulo, by means of cluster analysis. Units of analysis were the municipalities with convergent indicators of the sanitary, socioeconomic and structural situation of the municipal health system in 2018.

INDICATORS AND ANALYSIS MATRIX

In order to monitor access, effectiveness and adequacy of PHC in different population groups (women, adults, children, and elderly), the methodological model adapted from

Proadess¹⁷ was used. To build the municipal health scenario through a set of indicators, the properties of synthesis measures were consulted and the PHC attributes were considered. Considering what was defined for the validity and reliability of basic health indicators¹⁸, the selection was cautious, aiming at sensitivity, measurability, relevance, cost-effectiveness and integrity of data.

Twenty-five indicators were selected, classified and distributed into dimensions and sub-dimensions of an analysis matrix:

- core dimension of (1) Performance, with sub-dimensions of (1.1) Access (two indicators), (1.2) Effectiveness (11 indicators) and (1.3) Adequacy (five indicators);
- dimension of (2) Context, with sub-dimensions of (2.1) Population and health determinants (five indicators) and (2.2) Financing (two indicators).

The set of indicators organized in their respective dimensions and sub-dimensions, the calculation components and methods, and data sources are presented in the Supplementary Material 1.

For the indicator “hospitalizations due to Ambulatory Care Sensitive Conditions (ACSCs)”, part of the Effectiveness subdimension, the 19 groups of diagnoses defined by the Brazilian List of ACSC (Ordinance No. 221, of April 17, 2008)¹⁹ were adopted, not showing collinearity with the other indicators.

DATA COLLECTION

Data were collected from March to April 2020, through the Department of Informatics of the SUS (Datusus) and the São Paulo State Health Department. All municipalities in the state of São Paulo were included in the study, based on the criterion of availability of all information in SIS about the year 2018.

The information available in the Mortality Information System, Hospital Information System, Live Birth Information System, Notifiable Diseases Information System, Ambulatory Information System, State Data Analysis System Foundation, of Information on Public Health Budgets, National Agency for Supplementary Health, National Registry of Health Establishments and the Brazilian Institute of Geography and Statistics was also used.

STATISTICAL AND DESCRIPTIVE ANALYSIS

The indicators were calculated for each municipality and interpreted in their frequency measures. To identify groups of municipalities with homogeneous analytical characteristics, a multivariate cluster analysis²⁰ was used, which allowed to identify interdependence between variables characterizing each unit of analysis (municipality).

Initially, the means of 25 indicators were normalized into standard scores (or z-scores), considering the variability for each observation. The quadratic Euclidean measure (similarity) and Ward's minimum variance (Ward's method) were used as parameter for processing the analysis with a hierarchical method. Then, the clusters were visualized and defined by the minimum distance between variables belonging to each cluster (homogeneity) and the maximum distance between them (heterogeneity). To support the final number of clusters and their respective set of municipalities, a dendrogram was consulted. The analyses were performed in the statistical software Stata[®]15.

In the analysis matrix, the indicators were described according to medians corresponding to each cluster. The median, representing 50% of the distribution scale, was preferred due to the distribution of data, with the presence of outliers²¹. Then, the medians of indicators of each cluster were compared with each other and with the median values for the state of São Paulo. The expressions "minor", "intermediate" and "major", scaled from the smallest to the largest median, were used to characterize the behavior of indicators for each cluster, with the values of the state of São Paulo as a comparison parameter. Finally, to characterize and differentiate the distribution of clusters, the municipalities were georeferenced in the MapInfo[®]Pro v2019 software.

ETHICAL OPINION

This study was approved by the Research Ethics Committee of Irmandade da Santa Casa de Misericórdia de São Paulo (n° 4,007,368), of Universidade Federal de São Paulo/Hospital São Paulo (n° 2513230320) and of the Municipal Health Department of São Paulo (no. 4,110,528).

RESULTS

Six clusters were built out of the 645 municipalities in the state of São Paulo: cluster 1, cluster 2, cluster 3, cluster 4, cluster 5 and cluster 6. The municipalities encompassed by each cluster are described in Supplementary Material 2. Table 1 shows the set of indicators expressed in median value, organized by subdimension and for each cluster, as well as the median value for the state of São Paulo.

CLUSTERS' CHARACTERIZATION

- Cluster 1: made up of 221 municipalities, it had the second largest population. In the Access subdimension, intermediate results were seen for the coverage indicators of PHC and oral health teams, below those observed for the state of São Paulo. In the

Table 1. Median values of performance and context indicators of primary health care, according to clusters of municipalities in São Paulo that presented homogeneous analytical characteristics, 2018.

	Indicators	Cluster						
		1	2	3	4	5	6	SPS
Access	Primary health care coverage (%)	112.1	177.7	245.3	108.4	134.1	76.3	129.6
	Population coverage estimated by oral health teams (%)	70.2	135.9	181.8	58.5	60.4	21.5	80
Effectiveness	Asthma hospitalization rate (0–9 years) (per 100,000 inhabitants)	58.2	0	0	47	75.1	210.3	43.4
	Asthma hospitalization rate (total population) (per 100,000 inhabitants)	14.8	0	0	13.5	14.2	34.1	13.1
	Stroke hospitalization rate (30–59 years) (per 100,000 inhabitants)	64.7	61.2	70.4	52.9	50.8	54.2	59.3
	Acute respiratory failure hospitalization rate (<5 years) (per 10,000 children)	174.2	137.7	179.6	143.6	135.8	235.9	151.1
	Infant mortality rate (per thousand live births)	8.4	25	0	10.9	9.3	11	9.3
	Neonatal mortality rate (per thousand live births)	6.5	14.1	0	6.8	5.6	7.3	5.7
	Post-neonatal mortality rate (per thousand live births)	0	11.8	0	2.2	0.8	3.7	0
	Proportion of live births to teenage mothers (<20 years) (%)	12.4	14.3	13.7	14.9	11.9	10.4	13.2
	Proportion of low-birth-weight live births (%)	8.5	8.9	7.5	8.8	8.8	9.5	8.6
	Syphilis detection rate in pregnant women (per thousand live births)	11.1	6.1	0	12.5	12.8	30.1	10.5
Percentage of hospitalizations for Conditions Sensitive to Primary Care (%)	18.1	16.6	15.9	13.7	13.8	13.8	15.7	

Continue...

Table 1. Continuation.

	Indicators	Cluster						
		1	2	3	4	5	6	SPS
Adequacy	Proportion of cesarean sections among all deliveries (%)	78.2	76.8	83	53.2	61.9	50.8	70.7
	Proportion of cesarean sections among deliveries in the Unified Health System (%)	69.3	66.7	75	41.7	46.7	32.9	59.3
	Percentage of live births whose mothers had seven or more prenatal consultations (%)	85.4	85.2	87.5	81.5	81.5	80.5	84.4
	Ratio of cervical-vaginal cytopathological examinations (25–64 years)	0.49	0.6	0.73	0.5	0.51	0.45	0.5
	Screening mammography ratio in women (50–69 years)	0.32	0.39	0.59	0.28	0.32	0.29	0.3
Population and health determinants	Population (× thousand)	21	5.5	3.6	19.8	17.7	11.8	13.1
	Proportion of elderly people in the population (%)	16.4	17.5	18.2	14.1	14.5	14.7	15.7
	Gross domestic product per capita (Reais)	27.491	25.795	25.031	23.227	33.398	59.788	-
	Percentage of sectors with high vulnerability (São Paulo Social Vulnerability Index 5–7) (%)	10.4	10.2	0	28.4	10.8	16.4	11.7
	Percentage of people benefiting from private health plans (%)	22.1	12.8	14.5	13.3	29.8	48.7	19.3
Financials	Total health expenditure per capita (Reais)	857.1	1055.2	1490.8	853.4	975.5	895.9	923.6
	Percentage of health budget resources (%)	27.1	23.4	23.7	29.3	23.8	19.7	25.9

SPS: São Paulo state.

Source: Mortality Information System (SIM); Hospital Information System (SIH); Live Birth Information System (Sinasc); Notifiable Diseases Information System (Sinan); Outpatient Information System (SIA); State Data Analysis System Foundation (Seade); Information System on Public Health Budgets (Siops); National Supplementary Health Agency (ANS); National Registry of Health Establishments (CNES); and Brazilian Institute of Geography and Statistics (IBGE).

- Effectiveness subdimension, the post-neonatal mortality indicator stood out, with a median equal to 0, and the highest percentage of hospitalizations for ACSC among clusters and compared to the state of São Paulo. In the Adequacy subdimension, there was a higher proportion of cesarean deliveries among all deliveries and among deliveries performed within SUS (total deliveries and deliveries-SUS) and a lower ratio of cervical cancer screening exams in women aged 25 to 64 years (25–64 years). The Context dimension had the sectors with higher vulnerability, higher percentage of population benefiting from private health plans, lower total health expenditure per capita, and higher percentage of budgetary resources used in health;
- Cluster 2: made up of 62 municipalities, it had the second smallest population. The Access subdimension showed the second largest coverage of PHC and oral health teams. In the Effectiveness subdimension, it had the lowest rates of hospitalizations for asthma in children under 10 years of age and all ages (0–9 years and all ages) and for acute respiratory failure in children under 5 years, as well as the highest rates of infant, neonatal and post-neonatal mortality, the highest proportion of newborns born to adolescent mothers under 20 years of age, and the second highest percentage of hospitalizations for ACSC. The Adequacy subdimension had a higher proportion of cesarean deliveries (total deliveries and deliveries-SUS) and a higher ratio of cervical cancer screening exams in women (25–64 years). In the Context dimension, there was a higher proportion of elderly people, sectors with high vulnerability, the lowest percentage of population benefiting from private health plans, the highest total health expenditure per capita and the lowest percentage of budgetary resources used in health;
 - Cluster 3: formed by 86 municipalities, it had the smallest population. The Access subdimension showed the highest coverage by PHC and oral health teams. In the Effectiveness subdimension, the highlights were hospitalization rates for asthma (0–9 years and all ages), infant, neonatal and post-neonatal mortality, and syphilis detection in pregnant women—all with medians equal to 0—, the highest hospitalization rate for stroke in individuals aged 30 to 59 years, higher rate of hospitalization for acute respiratory failure in children, and the lowest proportion of low-birth-weight newborns. The Adequacy subdimension had the highest proportions of cesarean deliveries (total deliveries and deliveries-SUS), the highest percentage of pregnant women who had seven or more prenatal consultations, and the most reasons for cervical and breast cancer screening tests in women (25–64 years, 50–69 years, respectively). The Context dimension had the highest proportion of elderly people, absence of a median in sectors with high vulnerability, the lowest percentage of the population benefiting from private health plans, and the highest total health expenditure per capita;
 - Cluster 4: formed by 130 municipalities, it had the largest population. The Access subdimension had the second lowest coverage of PHC and oral health teams. The Effectiveness subdimension had the lowest rate of hospitalization for stroke (30–59 years), the highest proportion of newborns born to adolescent mothers (<20 years),

- the highest detection rate of syphilis in pregnant women and the lowest percentage of hospitalizations for ACSC. The Adequacy subdimension had a lower proportion of cesarean deliveries (total deliveries and deliveries-SUS) and the lowest ratio of mammography for breast cancer screening in women (50–69 years). The Context dimension had the lowest proportion of elderly people, the highest percentage of sectors with high vulnerability, the lowest per capita gross domestic product (GDP), the lowest percentage of the population benefiting from private health plans, the lowest total expenditure on health per capita, and the highest percentage of budgetary resources used in health;
- Cluster 5: formed by 145 municipalities, it had a large population. In the Access subdimension, intermediate results for coverage of PHC and oral health teams. The Effectiveness subdimension had the lowest rates of hospitalization for stroke (30–59 years) and for acute respiratory failure in children (<5 years), lower post-neonatal mortality rate, higher syphilis detection rate in pregnant women and lower percentage of hospitalizations for ACSC. The Adequacy sub-dimension had a lower percentage of pregnant women who had seven or more prenatal consultations. The Context dimension had a lower proportion of elderly people in the population, sectors with high vulnerability, higher GDP per capita, higher percentage of population benefiting from private health plans, and lower percentage of budgetary resources used in health;
 - Cluster 6: formed by the city of São Paulo, it had the largest population in the state. The Access subdimension had the lowest coverage of PHC and oral health teams. The Effectiveness subdimension had the highest rate of hospitalization for asthma (0–9 years and all ages) and acute respiratory failure in children (<5 years), the lowest proportion of newborns born to adolescent mothers (<20 years), the highest proportion of low-birth-weight newborns, the highest rate of syphilis detection in pregnant women and the lowest percentage of hospitalizations for ACSC. The Adequacy subdimension had the lowest proportion of cesarean deliveries (total deliveries and deliveries-SUS), the lowest percentage of pregnant women who had seven or more prenatal consultations, less reasons for cervical and breast cancer screening tests in women (25–64 years and 50–69 years, respectively). The Context dimension had a lower proportion of elderly people in the population, a higher percentage of sectors with high vulnerability, the highest GDP per capita, the highest percentage of the population benefiting from private health plans, the lowest total health expenditure per capita, and the lowest percentage of budgetary resources used in health.

CLUSTERS' SPATIAL CHARACTERIZATION

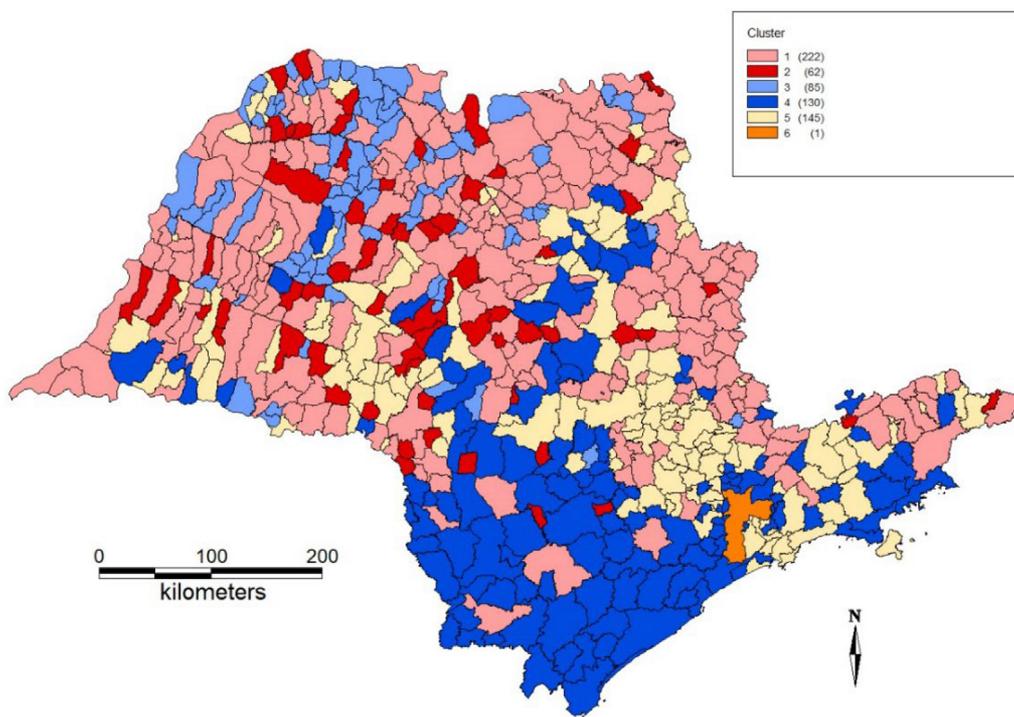
Some of the clusters had a marked geographic distribution in the state of São Paulo: the municipalities in cluster 1, the largest, appeared in almost the entire territory, except for the southern region, where cluster 4's municipalities were predominant; the municipalities in

cluster 2 were from the central and northwest regions of the state, being practically absent in the east and the south; cluster 3, in turn, had municipalities from the northwest region; the municipalities in cluster 4 were predominantly from the southern region and the northern coast; the municipalities in cluster 5, however, were mainly metropolitan areas such as São Paulo, Baixada Santista and Campinas, in addition to municipalities in the regions surrounding São José dos Campos, Piracicaba, Ribeirão Preto and Marília (Figure 1).

DISCUSSION

Our results allowed us to describe and discuss the different performance standards of PHC in the state of São Paulo in 2018 by means of cluster analysis.

In the analysis of access, based on population characteristics and considering that a medical or oral health professional, working 40 hours a week, should cover a population of three thousand inhabitants²², clusters 2 and 3 were predominantly made up of municipalities with low and high coverage; clusters 1, 4 and 5, on the other hand, have larger municipalities



Source: Prepared by the authors.

Figure 1. Georeferenced distribution of municipalities in São Paulo, according to homogeneous clusters defined based on a set of performance and context indicators related to primary health care, 2018.

and lower coverage; cluster 6, formed exclusively by the city of São Paulo was a particular case, with the largest population in Latin America (11,753,659) and the lowest coverage. Inequalities in access corroborated the contextual analysis: cluster 3 had low social vulnerability and high investment in health; cluster 4 had with lower coverage, high social vulnerability and less investments in health; cluster 5 had a higher GDP per capita and high coverage of private health plans.

Small municipalities stand out for the greater coverage of PHC, in view of the turnover of professionals who are part of the health teams and lower coverage of private health plans²³. In addition, in most of these municipalities, the economy is fragile by nature, reflected as difficulty in paying for basic services to the population²⁴. For the larger cities, the clusters with the highest population medians showed characteristics that elucidated the effects of the urbanization process and the social problems in these locations: low coverage of the FHS, limitations of effectiveness and resolution capacity of services, socioeconomic inequality, vulnerability, and a fragmented care network^{3,25}.

Although regionalization drives the establishment of Health Care Networks to strengthen, in a universal and equitable way, the integrality guaranteed by the SUS²⁶, the structural conditions must be reversed, given the deficit in the collection of the smallest municipalities and the chronic federal underfunding^{4,27}, to enable the coordinating character of PHC. In the reality of the largest centers, in addition to ensuring the financial sustainability of a regionalized PHC model, the modernization of E&M is essential to overcome, in line with urban and population development, the constraints in the expansion of the FHS in geopolitical territory²⁸.

In the effectiveness analysis, the clusters helped to visualize the consensus in the scientific literature: greater PHC coverage improves the overall health condition of the population^{29,30}. Cluster 3, from this perspective, presented the best performance for the set of indicators; the city of São Paulo (cluster 6), almost in ambivalence, presented the worst performance. The behavior of the indicators, in all clusters, put the spotlight on the debate around maternal and child health and chronic health conditions of adults and the elderly, with emphasis on the metropolitan regions³¹⁻³⁴.

However, cluster 2 draw attention, as it had municipalities with greater coverage of PHC and serious performance issues distributed in the state of São Paulo. With the highest infant, neonatal and post-neonatal mortality rates, the results of cluster 2 indicate a direct relationship with the socioeconomic conditions of these municipalities³⁵. The greater number of hospitalizations by ACSC, in turn, pointed to a deficiency in the integration and quality of care³⁶, with greater coverage of PHC not achieving satisfactory results. Thus, it is essential to understand the peculiar factors of municipal health systems in the regional contexts of the state of São Paulo, especially in the northwest region.

In the analysis of adequacy, the higher proportion of cesarean deliveries in smaller municipalities was added to the discussions on quality of prenatal care, bearing in mind the criticisms of the surgery, as well as clinical/organizational conducts established in health units^{15,37,38}. In this sense, the results brought to light the importance of taking action to deal

with teenage pregnancy, with a possibility to access to sexual and reproductive health educational policies³⁹. The detection and treatment of precursor lesions of cervical and breast cancer in women, especially in the largest centers, should be expanded in a timely and targeted manner^{40,41}.

In an effort to quantify, describe and present scenarios and health needs, we found inconsistencies and incoherencies in PHC performance indicators as quality criteria. The overall performance, despite limitations of secondary quantitative data from different SIS, was unsatisfactory and marked by health diversities, which homogeneously indicated sanitary and structural conditions that should be prioritized. The importance of accelerating the expansion of the FHS in the state of São Paulo is reinforced to improve the health of the population, especially in the largest centers, but the inadequacy of PHC coverage requires qualitative interventions to reorient the practice of health care when associated with programmatic vulnerabilities.

Finally, the analysis of performance by convergence stratified inequities in health for which the PHC un-funding policy, especially from 2020 onwards, tends not to cover, and it is up to the State to train and structure municipal and regional management to routinely promote prompt E&M for decision-making and budget restructuring. In a macro-political view, it is a priority to invest in the adequacy of the democratic model of PHC, in the access to technical-scientific advances and in the elaboration of a PNAB that enables the continuity of management, work and health care, with focus on the FHS and on the sense of social security and citizenship.

REFERENCES

1. Melo EA, Mendonça MHM, Oliveira JR, Andrade GCL. Mudanças na política nacional de atenção básica: entre retrocessos e desafios. *Saúde Debate* 2018; 42(spe 1): 38-51. <https://doi.org/10.1590/0103-11042018S103>
2. Giovanella L, Mendonça MHM, Fausto MCR, Almeida PF, Bousquat A, Lima JG, et al. A provisão emergencial de médicos pelo Programa Mais Médicos e a qualidade da estrutura das unidades básicas de saúde. *Ciênc Saúde Colet* 2016; 21(9): 2697-708. <https://doi.org/10.1590/1413-81232015219.16052016>
3. Pitombeira DF, Oliveira LC. Pobreza e desigualdades sociais: tensões entre direitos, austeridade e suas implicações na atenção primária. *Ciênc Saúde Colet* 2020; 25(5): 1699-708. <https://doi.org/10.1590/1413-81232020255.33972019>
4. Massuda A. Mudanças no financiamento da atenção primária à saúde no sistema de saúde brasileiro: avanço ou retrocesso? *Ciênc Saúde Colet* 2020; 25(4): 1181-8. <https://doi.org/10.1590/1413-81232020254.01022020>
5. Seta MH, Ocké-Reis CO, Ramos ALP. Programa Previnde Brasil: o ápice das ameaças à atenção primária à saúde? *Ciênc Saúde Colet* 2021; 26(suppl 2): 3781-6. <https://doi.org/10.1590/1413-81232021269.2.01072020>
6. Brasil. Instituto Brasileiro de Geografia e Estatística. Estimativas da população [Internet]. 2019 [cited on Mar 13, 2021]. Available at: <https://www.ibge.gov.br/estatisticas/sociais/populacao/9103-estimativasdepopulacao.html?edicao=25272&t=resultados>
7. Brasil. Instituto Brasileiro de Geografia e Estatística. Produto interno bruto dos municípios [Internet]. 2019 [cited on Mar 13, 2021]. Available at: <https://www.ibge.gov.br/estatisticas/economicas/contas-nacionais/9088-produto-interno-bruto-dos-municipios.html>
8. Sala A, Mendes JDV. Perfil de indicadores da atenção primária à saúde no estado de São Paulo: retrospectiva de 10 anos. *Saúde Soc* 2011; 20(4): 912-26. <https://doi.org/10.1590/S0104-12902011000400009>

9. Brasil. Informação e Gestão da Atenção Básica. e-Gestor Atenção Básica. Cobertura da atenção básica [Internet]. [cited on Mar 20, 2021]. Available at: <https://egestorab.saude.gov.br/paginas/ acessoPublico/relatorios/relHistoricoCoberturaAB.xhtml>
10. Sousa AN. Monitoramento e avaliação na atenção básica no Brasil: a experiência recente e desafios para a sua consolidação. *Saúde Debate* 2018; 42(spe 1): 289-301. <https://doi.org/10.1590/0103-11042018S119>
11. Sellera PEG, Pedebos LA, Harzheim E, Medeiros OL, Ramos LG, Martins C, et al. Monitoramento e avaliação dos atributos da atenção primária à saúde em nível nacional: novos desafios. *Ciêns Saúde Colet* 2020; 25(4): 1401-11. <https://doi.org/10.1590/1413-81232020254.36942019>
12. Viacava F, Almeida C, Caetano R, Fausto M, Macinko J, Martins M, et al. Uma metodologia de avaliação do desempenho do sistema de saúde brasileiro. *Ciêns Saúde Colet* 2004; 9(3): 711-24. <https://doi.org/10.1590/S1413-81232004000300021>
13. Viacava F, Ugá MAD, Porto S, Laguardia J, Moreira RS. Avaliação de desempenho de sistemas de saúde: um modelo de análise. *Ciêns Saúde Colet* 2012; 17(4): 921-34. <https://doi.org/10.1590/S1413-81232012000400014>
14. Tanaka OY, Drumond Júnior M, Cristo EB, Spedo SM, Pinto NRS. Uso da análise de clusters como ferramenta de apoio à gestão no SUS. *Saúde Soc* 2015; 24(1): 34-45. <https://doi.org/10.1590/S0104-12902015000100003>
15. Machado RC, Forster AC, Campos JJB, Martins M, Ferreira JBB. Avaliação de desempenho dos serviços públicos de saúde de um município paulista de médio porte, Brasil, 2008 a 2015. *Anais do Instituto de Higiene e Medicina Tropical* 2019; (Supl 1): S33-S45. <https://doi.org/10.25761/anaisihmt.319>
16. Parente AS, Santana ASR, Oliveira SRA. Desempenho dos serviços de saúde do SUS de uma macrorregião do estado de Pernambuco, Brasil. *Saúde Debate* 2021; 45(129): 300-14. <https://doi.org/10.1590/0103-1104202112904>
17. Fundação Oswaldo Cruz, Laboratório de Informações em Saúde. Proadess: avaliação de desempenho do sistema de saúde brasileiro: indicadores para monitoramento. Rio de Janeiro: Fiocruz; 2011. Available at: https://www.proadess.icict.fiocruz.br/Relatorio_Proadess_08-10-2012.pdf
18. REDE Interagencial de Informações para Saúde. Indicadores básicos para a saúde no Brasil: conceitos e aplicações. 2ª ed. Brasília: Organização Pan-Americana da Saúde; 2008. Available at: <http://tabnet.datasus.gov.br/tabdata/livroidb/2ed/indicadores.pdf>
19. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Portaria nº 221, de 17 de abril de 2008. Aprova a Política Nacional de Atenção Básica, determinando que a Secretaria de Atenção à Saúde, do Ministério da Saúde, publicará os manuais e guias com detalhamento operacional e orientações específicas dessa Política. Brasília: Diário Oficial da União. 2008 [cited on Dec 15, 2021]. Available at: https://bvsmis.saude.gov.br/bvs/saudelegis/sas/2008/prt0221_17_04_2008.html
20. Malhotra NK. Pesquisa de marketing: uma orientação aplicada. 7ª ed. Porto Alegre: Bookman; 2019.
21. Rodrigues CFS, Lima FJC, Barbosa FT. Importância do uso adequado da estatística básica nas pesquisas clínicas. *Braz J Anesthesiol* 2017; 67(6): 619-25. <https://doi.org/10.1016/j.bjan.2017.01.003>
22. Brasil. Ministério da Saúde. Gabinete do Ministro. Portaria nº 2.436, de 21 de setembro de 2017. Aprova a Política Nacional de Atenção Básica, estabelecendo a revisão de diretrizes para a organização da Atenção Básica, no âmbito do Sistema Único de Saúde. Brasília: Diário Oficial da União. 2017 [cited on Apr 24, 2021]. Available at: https://www.in.gov.br/materia/-/asset_publisher/Kujrw0TZC2Mb/content/id/19308123/do1-2017-09-22-portaria-n-2-436-de-21-de-setembro-de-2017-19308031
23. Pinafo E, Nunes EFPA, Carvalho BG, Mendonça FF, Domingos CM, Silva CR. Problemas e estratégias de gestão do SUS: a vulnerabilidade dos municípios de pequeno porte. *Ciêns Saúde Colet* 2020; 25(5): 1619-28. <https://doi.org/10.1590/1413-81232020255.34332019>
24. Carvalho BR, Ferreira JBB, Fausto MCR, Forster AC. Avaliação do acesso às unidades de atenção primária em municípios brasileiros de pequeno porte. *Cad Saúde Colet* 2018; 26(4): 462-9. <https://doi.org/10.1590/1414-462X201800040471>
25. Costa NR. A estratégia de saúde da família, a atenção primária e o desafio das metrópoles brasileiras. *Ciêns Saúde Colet* 2016; 21(5): 1389-98. Available at: <https://doi.org/10.1590/1413-81232015215.24842015>
26. Bousquat A, Giovanella L, Fausto MCR, Medina MG, Martins CL, Almeida PF, et al. A atenção primária em regiões de saúde: política, estrutura e organização. *Cad Saúde Pública* 2019; 35(supl 2): e00099118. <https://doi.org/10.1590/0102-311X00099118>
27. Peres UD. Dificuldades institucionais e econômicas para o orçamento participativo em municípios brasileiros. *Cad CRH* 2020; 33: e020007. <https://doi.org/10.9771/ccrh.v33i0.33972>
28. Barata RB. Saúde nas grandes metrópoles e populações socialmente vulneráveis. *Rev USP* 2015; (107): 27-42. <https://doi.org/10.11606/issn.2316-9036.v0i107p27-42>
29. Lima JG, Giovanella L, Fausto MCR, Bousquat A, Silva EV. Atributos essenciais da atenção primária à saúde: resultados nacionais do PMAQ-AB. *Saúde Debate* 2018; 42(spe 1): 52-66. <https://doi.org/10.1590/0103-11042018S104>

30. Paim J, Travassos C, Almeida C, Bahia L, Macinko J. The Brazilian health system: history, advances, and challenges. *Lancet* 2011; 377(9779): 1778-97. [https://doi.org/10.1016/S0140-6736\(11\)60054-8](https://doi.org/10.1016/S0140-6736(11)60054-8)
31. Luppi CG, Tayra A, Domingues CSB, Gomes SEC, Pinto VM, Silva MA, et al. Sífilis no estado de São Paulo, Brasil, 2011–2017. *Rev Bras Epidemiol* 2020; 23: E200103. <https://doi.org/10.1590/1980-549720200103>
32. Barros MBA, Francisco PMSB, Zanchetta LM, César CLG. Tendências das desigualdades sociais e demográficas na prevalência de doenças crônicas no Brasil, PNAD: 2003-2008. *Ciênc Saude Colet* 2011; 16(9): 3755-68. <https://doi.org/10.1590/S1413-81232011001000012>
33. Schenker M, Costa DH. Avanços e desafios da atenção à saúde da população idosa com doenças crônicas na atenção primária à saúde. *Ciênc Saude Colet* 2019; 24(4): 1369-80. <https://doi.org/10.1590/1413-81232018244.01222019>
34. Sanine PR, Dias A, Machado DF, Zarili TFT, Carrapato JFL, Placidei N, et al. Influência da gestão municipal na organização da atenção à saúde da criança em serviços de atenção primária do interior de São Paulo, Brasil. *Cad Saúde Pública* 2021; 37(1): e00242219. <https://doi.org/10.1590/0102-311X00242219>
35. Hatisuka MFB, Moreira RC, Cabrera, MAS. Relação entre a avaliação de desempenho da atenção básica e a mortalidade infantil no Brasil. *Ciênc Saude Colet* 2021; 26(9): 4341-50. <https://doi.org/10.1590/1413-81232021269.11542020>
36. Morimoto T, Costa JSD. Internações por condições sensíveis à atenção primária, gastos com saúde e estratégia saúde da família: uma análise de tendência. *Ciênc Saude Colet* 2017; 22(3): 891-900. <https://doi.org/10.1590/1413-81232017223.27652016>
37. Warmling CM, Fajardo AP, Meyer DE, Bedos C. Práticas sociais de medicalização & humanização no cuidado de mulheres na gestação. *Cad Saúde Pública* 2018; 34(4): e00009917. <https://doi.org/10.1590/0102-311X00009917>
38. Lucena FC, Garcia MT, Duarte LS. Taxas de cesárea no estado de São Paulo: desigualdades regionais na assistência obstétrica prestada pelo SUS. *Rev Bras Saúde Mater Infant* 2020; 20(4): 1151-63. <https://doi.org/10.1590/1806-93042020000400012>
39. Gama SGN, Viellas EF, Schilithz AOC, Thema Filha MM, Carvalho ML, Gomes KRO, et al. Fatores associados à cesariana entre primíparas adolescentes no Brasil, 2011-2012. *Cad Saúde Pública* 2014; 30(suppl 1): S117-27. <http://dx.doi.org/10.1590/0102-311X00145513>
40. Fayer VA, Guerra MR, Nogueira MC, Correa CSL, Cury LCPB, Bustamante-Teixeira MT. Controle do câncer de mama no estado de São Paulo: uma avaliação do rastreamento mamográfico. *Cad Saúde Colet* 2020; 28(1): 140-52. <https://doi.org/10.1590/1414-462X202028010322>
41. Silva GA, Jardim BC, Ferreira VM, Junger WL, Girianelli VR. Cancer mortality in the Capitals and in the interior of Brazil: a four-decade analysis. *Rev Saúde Pública* 2020; 54: 126. <https://doi.org/10.11606/s1518-8787.2020054002255>

Received on: 08/13/2021

Reviewed on: 01/10/2022

Accepted on: 05/10/2022

Author's contributions: Pinheiro Junior, R.V.B.: project administration, formal analysis, conceptualization, writing – original draft, writing – review & editing, methodology. Carneiro Junior, N.: writing – review & editing, funding acquisition, supervision. Sala, A.: formal analysis, conceptualization, writing – review & editing, methodology. Luppi, C.G.: writing – review & editing, methodology. Schweitzer, M.C.: writing – review & editing. Andrade, M.C.: writing – review & editing. Rufino, E.: writing – review & editing. Fogaça, L.Z.: writing – review & editing. Simões, O.: writing – review & editing. Wagner, G.A.: project administration, formal analysis, conceptualization, writing – review & editing, methodology, supervision.

