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Performance of Medical Schools and Students in a Rapid Expansion Era: A Cross-sectional Analysis

Guilherme Frayha

guifrayha@gmail.com

University of Campinas (UNICAMP)

Danette McKinley

Foundation for Advancement of International Medical Education and Research

Eliana Amaral

University of Campinas (UNICAMP)

Research Article

Keywords: Medical Education, Public Policy, Health Workforce, Medical Schools, Social accountability

Posted Date: March 22nd, 2026

DOI: https://doi.org/10.21203/rs.3.rs-8622396/v1

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Additional Declarations: No competing interests reported.

Abstract

Background

The rapid expansion of medical schools has been widely adopted as a strategy to address physician shortages and improve access to healthcare. In Brazil, a national policy implemented in 2013 substantially increased medical training capacity, largely through private-sector participation. However, concerns persist regarding whether rapid expansion improved access for students and patients while sustains educational quality. São Paulo is the most populous and economically developed state in Brazil, with structural, regulatory, and market characteristics comparable to those observed in middle- and high-income countries. This offers an informative analytical case to examine the effects of large-scale medical school expansion in a complex health professions education market.

Methods

This observational, descriptive, cross-sectional study analysed all active undergraduate medical programs registered in the Ministry of Education's e-MEC system in São Paulo State between 2013 and March 2025. Expansion patterns, geographic distribution, and regional socioeconomic characteristics were assessed using publicly available administrative data. Educational performance was evaluated using official data, the National Student Performance Exam (ENADE 2023) and the Preliminary Course Concept (CPC). Descriptive statistics and non-parametric tests were applied for group comparisons. Multivariate generalized linear models were used to assess associations between institutional characteristics and student performance.

Results

Between 2013 and 2025, 42 new medical programs were authorized, resulting in a 74.7% increase in available training seats. Expansion was predominantly driven by private institutions, which accounted for 80.5% of newly authorized seats, and was spatially concentrated in regions with higher socioeconomic development and stronger healthcare infrastructure. Regions with lower development indicators experienced little or no expansion. Medical schools with further from their establishment date and public ownership achieved significantly higher student performance scores, whereas newer, predominantly private institutions showed greater variability. Although public institutions demonstrated stronger student performance, they received lower ratings in infrastructure and didactic–pedagogical organization. In multivariate analyses, institutional age and ownership remained independently associated with student performance, while no variables showed significant associations with the overall institutional performance score.

Conclusions

The expansion of medical education in São Paulo State produced substantial quantitative growth but failed to reduce territorial inequalities. Educational quality was more strongly associated with institutional maturity and public ownership than with expansion alone. As an analytical case reflecting dynamics seen in other regulated health education systems, our example highlights the limits of market-driven expansion and underscores the need for integrated policies that align growth with quality assurance, accreditation, and workforce retention strategies to promote equitable and sustainable healthcare access.

INTRODUCTION

Medical schools' expansion and human resources for health

For more than a decade, international literature has highlighted persistent shortages and maldistribution of physicians as a central challenge for health systems worldwide[1–3]. One commonly adopted strategy to address these imbalances has been the expansion of medical schools and the increase in training capacity. In Brazil, longstanding inequalities in physician distribution and unmet healthcare needs have driven successive public policies aimed at strengthening workforce availability in underserved regions. Policies were intended to expand medical schools in regions with lower physician density[4] and increase the physician workforce[4,5].

Implementation of the policies resulted in a rapid and large-scale expansion of medical education, contributing to an increase in the national physician-to-population ratio from 1.76 per 1,000 inhabitants in 2013 to 2.98 in 2025, although variation in geographic distribution persisted[6]. While some service gaps were partially addressed — particularly through newly established decentralized federal medical schools[7] — the accelerated growth generated important challenges related to regulatory capacity, including difficulties in recruiting qualified faculty, securing adequate clinical training environments, and ensuring consistent supervision. These concerns raised questions about institutional performance and training quality[8]. In response, the Ministry of Education (MEC) declared a moratorium in 2018, suspending authorization for new medical courses for five years[9]. Despite this measure, several programs were approved through judicial decisions, bypassing the original requirements of the More Doctors policy[10].

By March 2025, Brazil had 447 active medical courses registered, with more than half (239) established after October 2013[11]. The number of authorized training seats increased from 20,570 to 48,451[6,11]. Expansion was predominantly driven by private institutions (80% of all new seats)[6]. Within this context, São Paulo State with 22% of Brazil's population (46,081,801 inhabitants)[12] and 18% of the nation's medical schools, and 91% of all seats offered by private institutions[6].

The National Curricular Guidelines (DCN) are federally mandated standards issued by the Brazilian Ministry of Education that define competencies, learning outcomes, and organizational principles for undergraduate medical education, aligned with the values of the Unified Health System (SUS). The updated 2025 DCN reemphasized the focus on generalist medical doctor training, stressing critical reasoning, humanistic values, and social accountability[13]. Nonetheless, concerns remain regarding whether existing regulatory and evaluation systems are sufficient to ensure educational quality and foster institutional improvement, particularly in contexts of rapid expansion[8].

Using medical schools in São Paulo State as a case-study, we aim to investigate factors associated with institutional and student performance, while examining the geographical distribution of schools and training seats related to the economic development of the region. First, we looked at geographic distribution to examine the extent to which the goal of expansion into areas with fewer resources was achieved. To examine whether there was an association between expansion and educational quality, we analysed student performance on national examinations, and institutional ratings. By focusing on institutional performance during rapid expansion, this analysis offers a data-driven approach that can mirror other regulated health education systems and contributes to the international debate on whether expansion policies can simultaneously promote geographic equity and educational quality.

METHODS

Study design and inclusion criteria

This observational, descriptive, cross-sectional study was conducted using secondary administrative data collected between February and March 2025. The primary data source was the electronic e-MEC system[11], the official and publicly accessible registry of higher education programs maintained by the Brazilian Ministry of Education (MEC). All active undergraduate medical programs offered by medical schools located in São Paulo State (SP) were identified and included. Programs that were inactive, deregistered, or located outside São Paulo State were excluded.

The study was structured in two analytical phases. The first phase examined the alignment between policy goals and the expansion and geographic distribution of medical schools. The second phase focused on institutional characteristics and factors associated with student outcomes. Data were extracted from official sources at a single time point and cross-checked across databases when applicable to minimize the effects of delayed data updates.

All active undergraduate medical programs registered in São Paulo State during the study period were included. The e-MEC system defines schools by ownership and legal status. For this study, the classifications for public schools are federal, state, and “special” institutions. Federal public institutions are maintained by the federal government and are generally affiliated with federal universities; state public institutions are managed by state governments. Both categories are tuition-free. Municipal public institutions, classified in the e-MEC system as “special” institutions, are maintained by municipal

authorities and may charge tuition fees if established prior to the 1988 Federal Constitution[14]. In this study, the terms “municipal public” and “special” institutions are used interchangeably.

Private medical schools were classified into three categories: sectarian institutions linked to religious organizations; non-profit institutions that reinvest financial resources into educational activities; and for-profit institutions that distribute profits to shareholders[15]. When examining geographic distribution, sectarian and other nonprofit institutions were grouped together. When examining educational quality, sectarian institutions were analysed separately to allow a more refined assessment of institutional performance.

Geographic distribution

To examine the extent to which the goals of expansion improved geographic distribution and access, we used three sets of variables. Changes in medical education capacity across São Paulo State were measured by the number of medical schools and authorized training seats, stratified by administrative category and institutional age. These data were obtained directly from the e-MEC public records[11].

To investigate whether the geographic distribution of medical schools reduced inequalities in distribution, each institution was geocoded by municipality and subsequently grouped according to the Administrative Regions (ARs) defined by the São Paulo Geographic and Cartographic Institute (IGC-SP)[16]. These regions were used as the main territorial units due to the availability of socioeconomic data.

We incorporated socioeconomic and demographic characteristics of the ARs hosting medical schools. Indicators related to economic development, social conditions, and population size were extracted from the State System for Data Analysis (SEADE), maintained by the Secretariat of Economic Development of São Paulo State[17]. All datasets used in this phase were publicly available through the e-MEC and SEADE databases.

Spatial representations of the distribution of medical schools across the sixteen Administrative Regions were developed using Google Earth® and Adobe Illustrator®. Regional boundaries were based on official geographic data provided by the IGC-SP[16].

Educational performance indicators and statistical analysis

Data on institutional performance were obtained from official 2023 report published by the National Institute for Educational Studies and Research Anísio Teixeira (INEP), including results from the National Student Performance Exam (ENADE) and the Preliminary Course Concept (CPC)[18]. ENADE evaluates graduating students’ academic achievement through a multiple-choice assessment with two components, one for general knowledge and another for medical knowledge. The CPC is a composite

indicator calculated from a weighted set of components, including students' performance on ENADE, the value added by the educational process, faculty qualifications and dedication, and students' perceptions of training conditions, such as pedagogical organization, infrastructure, and opportunities for academic and professional development[18].

Although the final published CPC grade is reported as a categorical integer, the underlying continuous scores were used for statistical analyses. Comparisons of proportions were conducted using the chi-square test or Fisher's exact test, when appropriate. Comparisons of continuous variables between two groups were performed using the Mann–Whitney U test, while comparisons among three or more groups used the Kruskal–Wallis test, followed by Dunn's post-hoc test to identify pairwise differences when statistically significant. Associations between continuous variables were assessed using Spearman's rank correlation coefficient. For all analyses, the level of statistical significance was set at $p < 0.05$.

Ethical considerations and reporting standards

This study was approved by the Research Ethics Committee under CAAE 90115225.0.0000.5404. The analysis was based exclusively on publicly available secondary data, without identification of individuals or access to sensitive information. Parts of the English translation and language revision were assisted by an AI-based large language model (ChatGPT, OpenAI), under the authors' supervision. The study design and reporting followed the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement, ensuring transparency, reproducibility, and methodological rigor.

RESULTS

Expansion and Geographic Distribution

Between October 2013 and March 2025, São Paulo State recorded the authorization of 42 new undergraduate medical programs, increasing the total number of active medical schools to 80. During this period, the number of entry-level medical seats increased by 74.7%, rising from 5,661 to 9,892. Most of this expansion occurred before the implementation of a moratorium phase, and by April 2018, the number of authorized seats had already increased to 8,487.

Of the 42 new medical programs, 17 (40.5%) were authorized under for-profit private institutions, followed by 14 (33.3%) nonprofit private institutions. Overall, private institutions accounted for 80.5% of all newly authorized seats (n=3,405), whereas public institutions — including municipal programs — represented only 19.5% of the expansion in training capacity (Figure 1).

Socioeconomic Context and Distribution of Medical Schools

The expansion was spatially concentrated in AR XIII and XV (47.5% of all newly authorized programs), with 11 and 10 new medical schools, respectively. Figure 2 presents the spatial distribution of medical

schools according to administrative category and period of establishment (before or after 2013).

Regions with higher socioeconomic development (XV and XIII) combining the largest populations with the highest levels of economic output, experienced the most substantial increases in both the number of programs and authorized seats. In contrast, regions characterized by lower per capita income, higher illiteracy rates, and worse health indicators — particularly infant mortality — showed limited or no expansion (Tables 1).

Table 1. Administrative Regions of the Sao Paulo State with their socioeconomic and health indicators.

Administrative Region	Population	GDP per capita (R$)	Illiteracy *	Infant mortality*
XV	20.751.191	88.045	2.8	11.3
XIII	7.110.442	93.170	2.9	9.5
IX	2.679.464	64.534	3.2	12.4
XVI	2.530.487	71.821	2.9	11.4
XIV	1.817.099	54.905	3.0	12.3
III	1.626.818	51.852	3.9	10.0
XI	1.399.563	64.977	3.2	11.8
V	1.115.716	60.376	3.4	11.4
VIII	1.029.194	63.352	3.6	12.2
IV	973.565	53.235	3.9	13.4
I	859.287	44.379	4.4	10.8
II	776.333	48.032	4.1	12.0
XII	744.637	53.967	3.5	11.0
VI	524.764	42.512	5.7	11.0
VII	440.381	60.625	3.8	10.3
X	272.773	46.603	5.8	15.2
State	44.651.714	77.958	3.1	11.2

GDP = Gross Domestic Product | *per 1000 live births | ** percentage of the population

Table 2 summarizes the distribution of new training seats by AR before and after 2013. Statewide availability increased from 1.29 to 2.25 seats per 10,000 inhabitants, approximately 75% growth. However, this increase was uneven across regions. In contrast, AR VI and X, among the lowest GDP per capita, did not receive any new medical programs or seats during the expansion period. Despite

substantial absolute growth in AR XV and XIII, the rates of seat availability per capita in these populous regions remained low. Conversely, one AR (V), with no medical schools in 2013, reached one of the highest seat densities per 10,000 inhabitants by 2025. These findings highlight persistent inequities despite the increase in training capacity.

Table 2. Administrative Regions of the State of São Paulo, availability of medical schools, seats, and seats per 10,000 inhabitants, before and after 2013*.

Administrative Region	Medical Schools (2013)	Medical Schools (2025) (% increase)	Seats/10,000 inhabitants (2013)	Seats/10,000 inhabitants (2025)**	Seats in 2013	Seats in 2025 (% increase)
XV	12	22 (83.3)	1.21	1.88	2521	3912 (55.2)
XIII	5	16 (120)	1.09	2.39	745	1629 (118.7)
IX	2	6 (200)	0.88	2.01	220	500 (127.3)
XVI	1	4 (300)	0.49	2.04	120	500 (316.7)
XIV	2	5 (150)	1.11	2.67	200	480 (140)
III	6	7 (16.7)	4.38	4.78	665	725 (9)
XI	3	4 (33.3)	2.63	3.19	360	436 (21.1)
V	0	3	0	3.74	0	415
VIII	2	2 (0)	1.88	1.88	190	190 (0)
IV	2	3 (50)	2.36	2.98	230	290 (26.1)
I	1	3 (200)	2.56	4.50	220	386 (75.5)
II	0	2	0	2.24	0	173
XII	1	2 (100)	1.34	2.22	100	166 (66)
VI	0	0 (0)	0	0	0	0 (0)
VII	1	1 (0)	2.08	2.08	90	90 (0)
X	0	0 (0)	0	0	0	0 (0)
State	38	80	1.29	2.25	5661	9892

*Year of implementation of the More Doctors Law

**Total undergraduate medical seats per 10,000 inhabitants in March 2025

Institutional Characteristics and Performance

Among the 80 medical schools active in São Paulo State, only 55 had assigned CPC and ENADE indicators in the 2023 national evaluation cycle, reflecting the absence of graduating cohorts in newer programs. Public institutions consistently achieved CPC scores above 3.0 and were predominantly among those with more than 30 years of operation. Private and municipal institutions showed greater dispersion and were more frequently concentrated in lower CPC ranges (Figure 3; Table 3).

Federal and state public medical schools also achieved the highest average student performance scores, measured by the continuous ENADE score (4.34 ± 0.36), with significant differences compared to all other administrative categories (p = 0.0018). Both general and specific components of ENADE showed the same trends (Table 3). In contrast, federal and state institutions presented lower average scores in the domains of Didactic-Pedagogical Organization and Infrastructure (p=0.04) and Physical Facilities (p=0.04), according to student perceptions, when compared to private institutions.

Table 3. Comparison of the Program Score Descriptors (standardized) and Institutional Age by Administrative Type among Medical Schools in the State of São Paulo

Variable (Mean ± Standard Deviation)	**Federal + State**	**Private For-Profit**	**Private Nonprofit**	**Municipal & Religious**	**TOTAL**	P-Value
	(N=6)	(N=14)	(N=25)	(N=10)	(N=55)	
Institution Age (years)	58.17 ± 21.85	15.64 ± 13.31	23.20 ± 19.14	34.10 ± 26.29	27.07 ± 22.85	0.0050
*CPC (Continuous)	3.63 ± 0.32	2.79 ± 0.73	2.88 ± 0.88	2.60 ± 0.74	2.89 ± 0.81	0.0908
Enade Score	4.34 ± 0.36	2.10 ± 0.94	2.58 ± 1.27	2.89 ± 1.05	2.70 ± 1.24	0.0018
Enade General Component	4.32 ± 0.44	1.93 ± 0.70	2.53 ± 1.15	2.78 ± 0.99	2.62 ± 1.16	0.0004
Enade Specific Components	4.35 ± 0.38	2.15 ± 1.06	2.59 ± 1.39	2.92 ± 1.13	2.73 ± 1.32	0.0052
Didactic-Pedagogical Organization	2.69 ± 0.46	3.77 ± 0.76	3.77 ± 0.96	3.53 ± 1.13	3.61 ± 0.94	0.0379
Infrastructure and Physical Facilities	2.61 ± 0.54	3.88 ± 0.77	3.78 ± 0.97	3.70 ± 1.26	3.66 ± 1.00	0.0393
Opportunities for Academic Development	2.88 ± 0.68	3.46 ± 0.92	3.35 ± 1.37	3.25 ± 1.17	3.31 ± 1.16	0.6175

*Course Score (CPC) | All scores range from 0 to 5.

Student Performance

Student performance distributions by administrative category and institutional age are shown in Figure 4. Federal and state public institutions achieved mean ENADE scores close to or above 4.0, while private and municipal institutions exhibited greater variability, with almost half scoring below 4.0.

Institutions operating for more than 30 years demonstrated significantly higher average ENADE scores compared with programs up to 10 years old and those with intermediate years of operation (3.52 ± 1.07; p = 0.0015) (Table 4). This pattern was observed for both the general and specific - medical knowledge- components of student´s performance examination. When analysing separately the specific component, statistically significant differences were observed only between institutions older than 30 years and those up to 10 years (p = 0.0076). No statistically significant differences were identified across institutional age groups for Didactic-Pedagogical Organization, Infrastructure and Physical Facilities, Opportunities for Academic Development, or the summative continuous CPC score – Table 4.

Table 4. Comparison of Course Score (CPC) Descriptors by Institutional Age Range among Medical Schools in the State of São Paulo

Variable	≤ 10 years	11–30 years (N=19)	> 30 years (N=17)	TOTAL (N=55)	
	N=19 Mean (± SD)	Mean (± SD)	Mean (± SD)	Mean (± SD)	P-Value[1]
Enade Score	2.06 ± 1.30	2.62 ± 0.91	3.52 ± 1.07	2.70 ± 1.24	0.0015
Enade General Score	1.99 ± 0.95	2.39 ± 0.91	3.58 ± 1.03	2.62 ± 1.16	0.0002
Enade Specific Score	2.08 ± 1.47	2.70 ± 0.98	3.50 ± 1.11	2.73 ± 1.32	0.0076
Didactic-Pedagogical Organization	3.70 ± 0.87	3.84 ± 0.92	3.26 ± 1.00	3.61 ± 0.94	0.1640
Infrastructure and Physical Facilities	3.78 ± 0.86	3.87 ± 1.01	3.31 ± 1.09	3.66 ± 1.00	0.1908
Opportunities for Academic Development	3.04 ± 1.22	3.46 ± 1.19	3.44 ± 1.06	3.31 ± 1.16	0.4882
*CPC	2.68 ± 0.99	2.91 ± 0.62	3.09 ± 0.76	2.89 ± 0.81	0.2535

[1] Kruskal–Wallis Test | * Course Score (CPC) | All scores range from 0 to 5.

Multivariate analyses using generalized linear models confirmed that institutional age and administrative category remained independently associated with student and school performance. Programs operating for more than 30 years achieved higher ENADE scores than those with up to 10 years of operation (p = 0.0097), and federal or state public institutions performed significantly better than municipal or religious

(p = 0.0287), for-profit private (p = 0.0021), and nonprofit private (p = 0.0088) institutions. No variables showed statistically significant associations with the summative CPC score.

DISCUSSION

The expansion of medical schools in the region, following the implementation of the More Doctors Program, resulted in a substantial increase in training capacity, largely driven by private institutions and concentrated in regions with stronger infrastructure, better social indicators, and higher economic development. In contrast, the most underserved regions did not receive new medical programs. These findings indicate that the Brazilian National policy aiming to stimulate medical training in priority and underserved areas was not reached in the most populous and economically developed state. This pattern mirrors national trends, with limited expansion in regions with lower socioeconomic development, fragile academic structures, and insufficient health-service capacity[19].

The selective and uneven expansion observed across São Paulo State further illustrates how market-driven growth tends to reinforce pre-existing territorial disparities. It is also important to highlight that rapid expansion risks exceeding the capacity required for adequate training clinical spaces in the health system, qualified supervision, risking competency development of trainees. The present findings also demonstrate that medical schools with longer institutional trajectories tend to achieve better educational outcomes, particularly in student performance measures, corroborating previous national studies[8,20]. Most newer institutions — predominantly private — have not yet reached comparable levels of performance, reinforcing concerns that rapid expansion may compromise educational quality in the absence of sufficient institutional maturation.

Concerns about shortages in medical specialties have recently motivated a new federal initiative, “Now We Have Specialists”, which aims to expand access to high-demand specialties through limited increases in training positions and larger incentives for private-sector participation[21]. However, evidence suggests that physician retention in underserved areas depends on multiple, interrelated factors, including the location of specialty training[22] and broader perceptions of quality of life for professionals and their families[23]. It therefore remains uncertain whether this strategy will improve equitable access to specialized care or further strengthen private-sector control over service provision.

Interestingly, federal and state public institutions, despite achieving higher student performance, received lower ratings in domains related to didactic-pedagogical organization and infrastructure. This apparent paradox may reflect the strong critical thinking and academic attitude of students under a selective admission processes characteristic of public universities, alongside structural constraints such as limited funding, bureaucratic rigidity, and reduced managerial flexibility[24]. In contrast, private institutions—especially for-profit ones—often demonstrate greater capacity for infrastructure investment without reaching equivalent academic outcomes. This divergence raises broader questions about how market-driven logic shapes educational quality and the preparation of doctors aligned with the values and premises of the public health systems[25].

This study has important limitations. Its cross-sectional design precludes causal inference, and the use of secondary administrative data may involve reporting inconsistencies. The analysis did not include qualitative dimensions of training, a deeper analysis of physician distribution, nor direct measures of professional competence or quality of care. It also does not focus on impact of expansion on health indictors, a difficulty outcome to assess due to multiple confounding variables. Additionally, as the focus was limited to a wealthy jurisdiction, the findings may not be fully generalizable to less developed regions.

Another central issue concerns the reliance on regulatory indicators such as ENADE and CPC as indirect measures of educational quality. While these instruments are valuable for system-level monitoring and policy guidance, they provide only partial assessments of quality and may inadequately capture institutional weaknesses or strengths[26]. Moreover, student performance evaluations carry the risk of incentivizing teaching practices oriented toward test preparation rather than comprehensive, clinically grounded, and transformative education. A comprehensive evaluation of medical education requires integration of multiple dimensions. Accreditation frameworks based on global standards, such as those of the World Federation for Medical Education (WFME) adapted to local contexts, remain key benchmarks for quality and international legitimacy[27]. In Brazil, the Sistema de Acreditação de Escolas Médicas (SAEME), recognized by the WFME, provides a voluntary external evaluation process, though it lacks regulatory authority[28]. As of 2024, only 76 schools had undergone voluntary evaluation, with 72.4% receiving accreditation[29].

At the same time, international trends increasingly emphasize learning outcomes assessed through national licensing examinations—such as the United Kingdom's Medical Licensing Assessment[30] — or through longitudinal, programmatic assessment models[31,32] incorporating multiple sources of evidence, including Entrustable Professional Activities (EPAs)[33]. Although high-stakes examinations ensure minimum competence, their limitations in assessing attitudinal, ethical, and professional dimensions of practice are well recognized[34–36]. Brazil's evaluation landscape is currently evolving with the recent implementation of the National Medical Assessment Exam (ENAMED), designed to assess students at stages of training, before entry into internship training due in 5th and 6th year[37]. This initiative aligns Brazil with international models of progressive assessment, although its current format is focused on cognitive skills.

Taken together, these findings underscore the limits of market-driven expansion in addressing territorial inequities and sustaining educational quality. Effective workforce planning requires integrated strategies encompassing undergraduate education, residency training, working conditions, and broader intersectorial policies aligned with the organizational capacity of the health system in place. The territory under study — whose demographic and economic characteristics resemble those of middle-high income settings— illustrates challenges that are highly relevant internationally, reinforcing the need for regulatory frameworks that balance expansion with quality, accountability, and social mission.

CONCLUSION

The expansion of medical schools in São Paulo State following the 2013 national policy produced substantial quantitative growth, largely driven by private institutions and concentrated in regions with higher socioeconomic development and more robust healthcare infrastructure. Consequently, the central policy objective of reducing territorial inequalities in medical training was not achieved in the country's most populous and economically developed state, highlighting the limits of market-oriented expansion strategies in addressing inequitable access.

Abbreviations

AR
Administrative Region
CAAE
Certificate of Presentation for Ethical Review
CPC
Preliminary Course Concept
DCN
National Curricular Guidelines
GDP
Gross Domestic Product
IBGE
Brazilian Institute of Geography and Statistics
IGC
SP–São Paulo Geographic and Cartographic Institute
INEP
National Institute for Educational Studies and Research
MEC
Ministry of Education
PITS
Program for the Decentralization of Health Work
PROVAB
Program for the Valorization of Primary Care Professionals
REUNI
Program for the Support to Restructure and Expansion of Federal Universities
SEADE
State System for Data Analysis
SUS
Unified Health System
WHO
World Health Organization

Declarations

Ethics approval and consent to participate

Approved by the Research Ethics Committee of School of Medical Sciences, University of Campinas (Unicamp) under protocol CAAE 90115225.0.0000.5404.

Consent to Participate declaration

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

All data are publicly available from the e-MEC system (https://emec.mec.gov.br) and SEADE Foundation databases (https://painel.seade.gov.br/saude/).

Competing interests

The authors declare that they have no competing interests.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Authors’ contributions

GF collected, analyzed, and interpreted data and drafted the manuscript. EA supervised the study, contributed to conceptualization, and critically reviewed the manuscript. DM supervised the study, contributed to conceptualization, and critically reviewed the manuscript. All authors read and approved the final version.

Acknowledgements

This study was supported by the Coordination for the Improvement of Higher Education Personnel (CAPES) – Brazil – Funding Code 001.

Authors' information

Guilherme Frayha, MD is a master’s student in Health Professions Education at the School of Medical Sciences, University of Campinas (Unicamp), Brazil. ORCID: 0009-0005-9561-5052.

Eliana Amaral, MD, PhD is Full Professor at the Department of Obstetrics & Gynecology at the School of Medical Sciences, University of Campinas (UNICAMP). ORCID: 0000-0001-9151-3108.

Danette McKinley, PhD, is Senior Analyst at the Foundation for International Medical Education and Research (FAIMER), a division of Intealth, United States. ORCID: 0000-0002-8709-0365.

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Figures

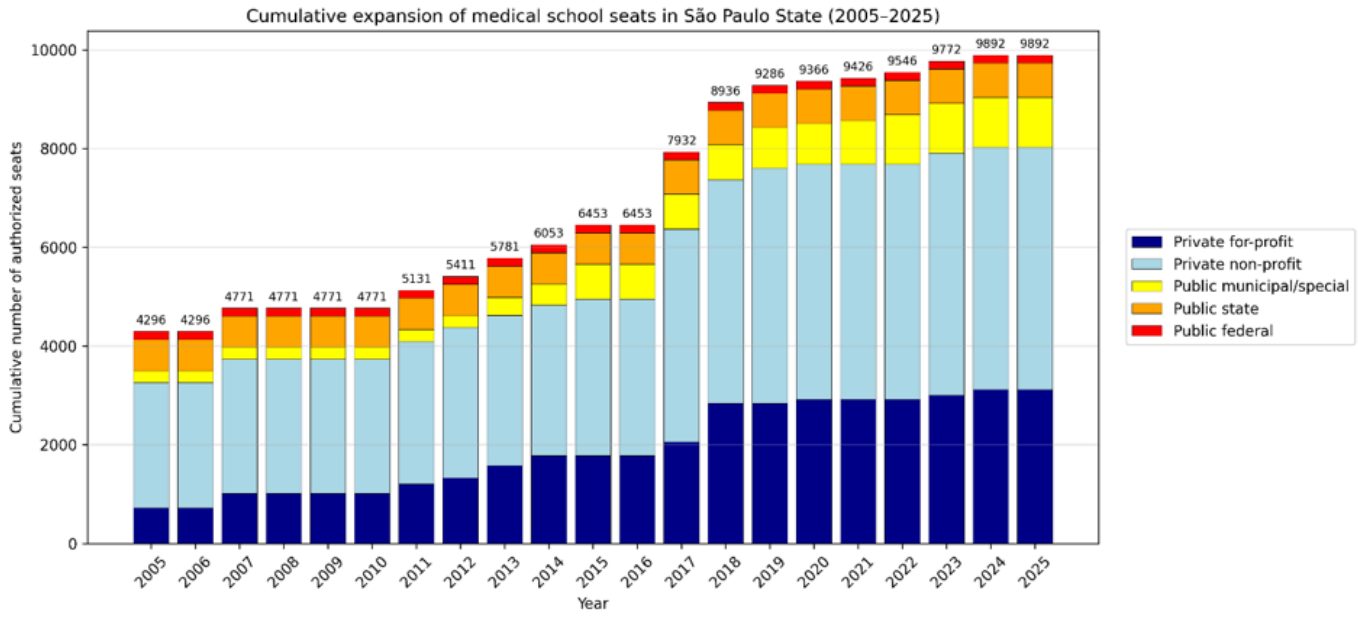


Figure 1

Evolution of the Cumulative Total seats at Medical Schools in the State of São Paulo, by Administrative Category (2005–2025).

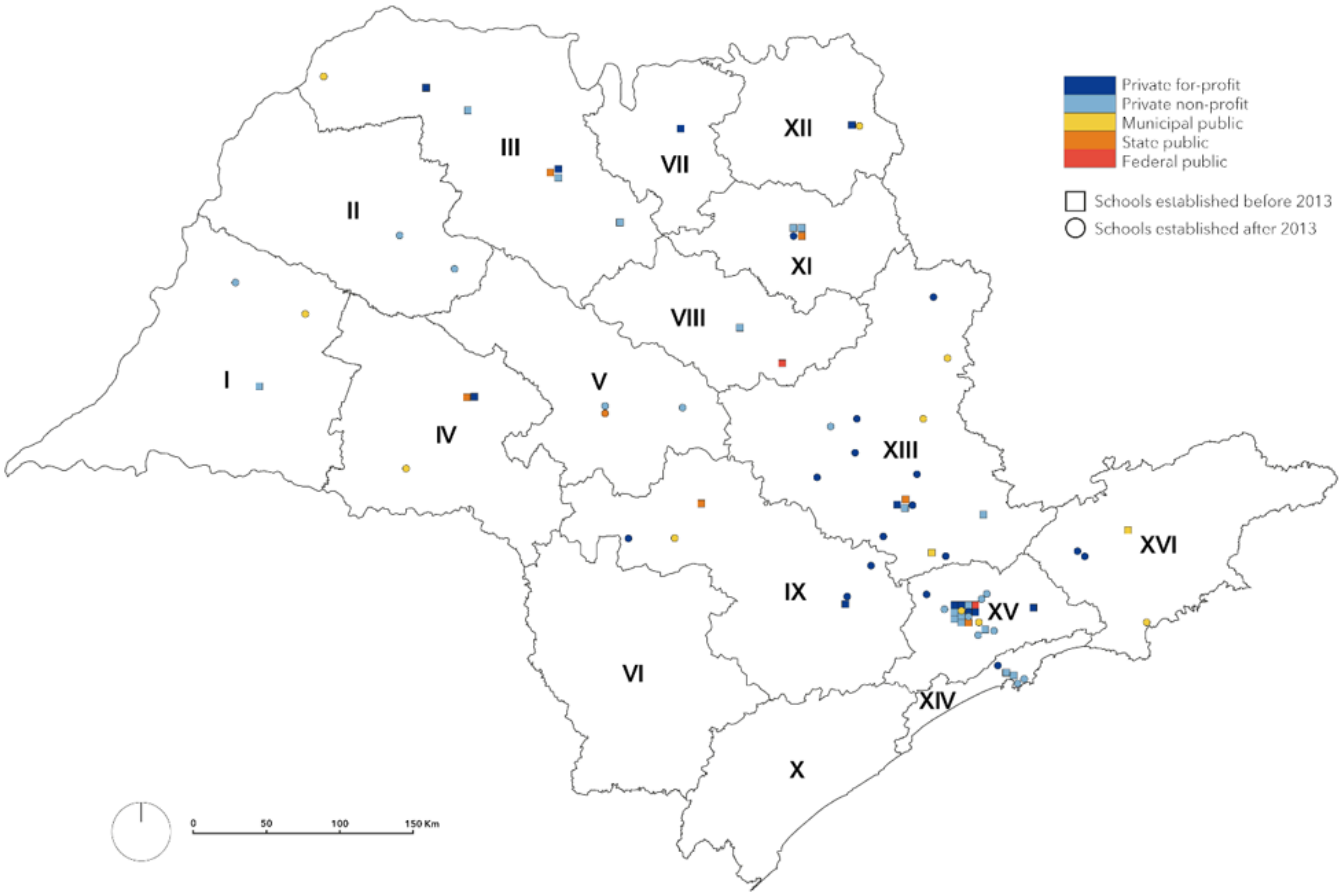


Figure 2

Spatial representation of medical courses in the state of São Paulo as of March 2025, classified by administrative category and year of establishment.

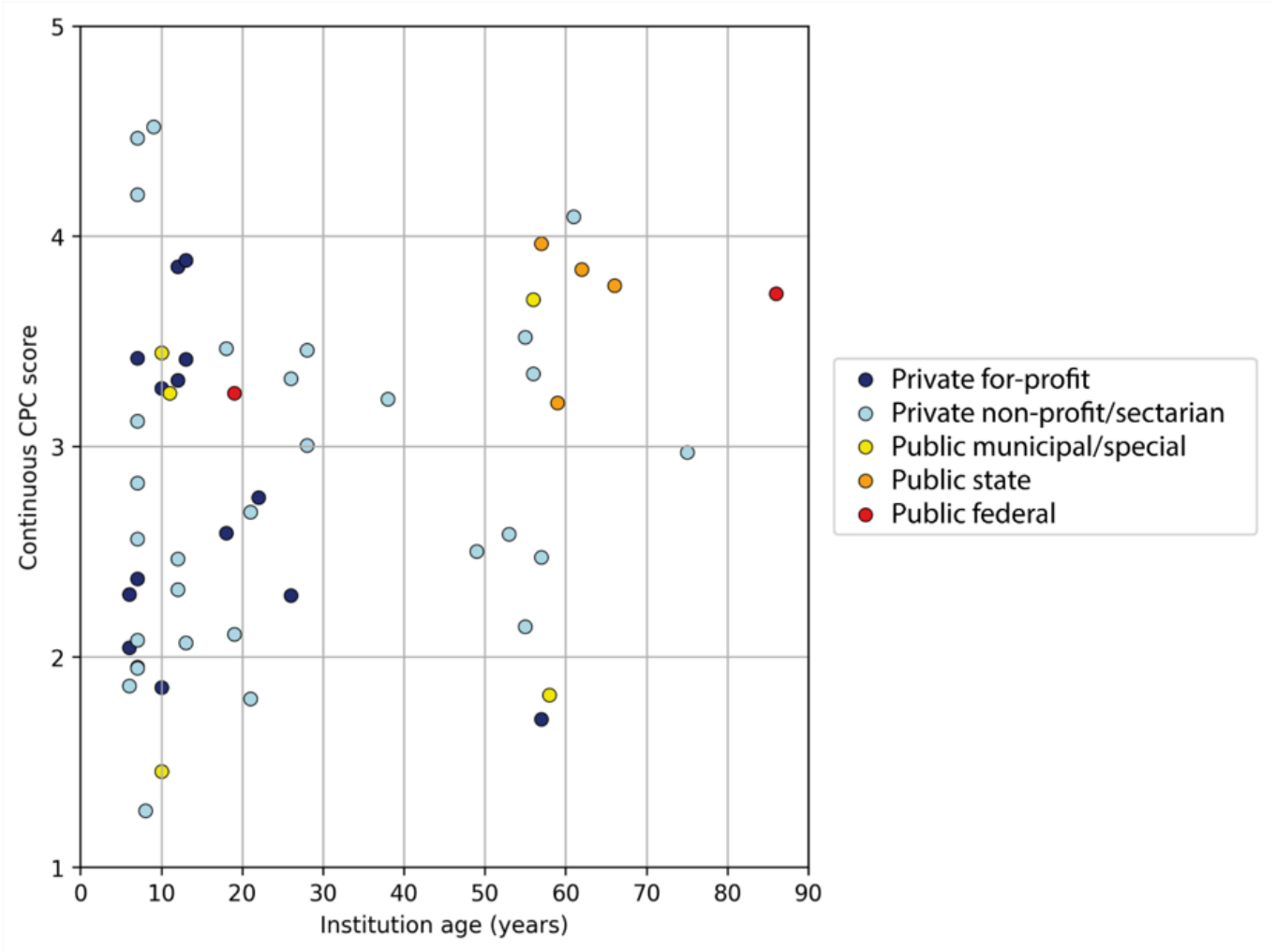


Figure 3

Distribution of continuous course score (CPC) according to the year of establishment of medical schools, categorized by administrative type.

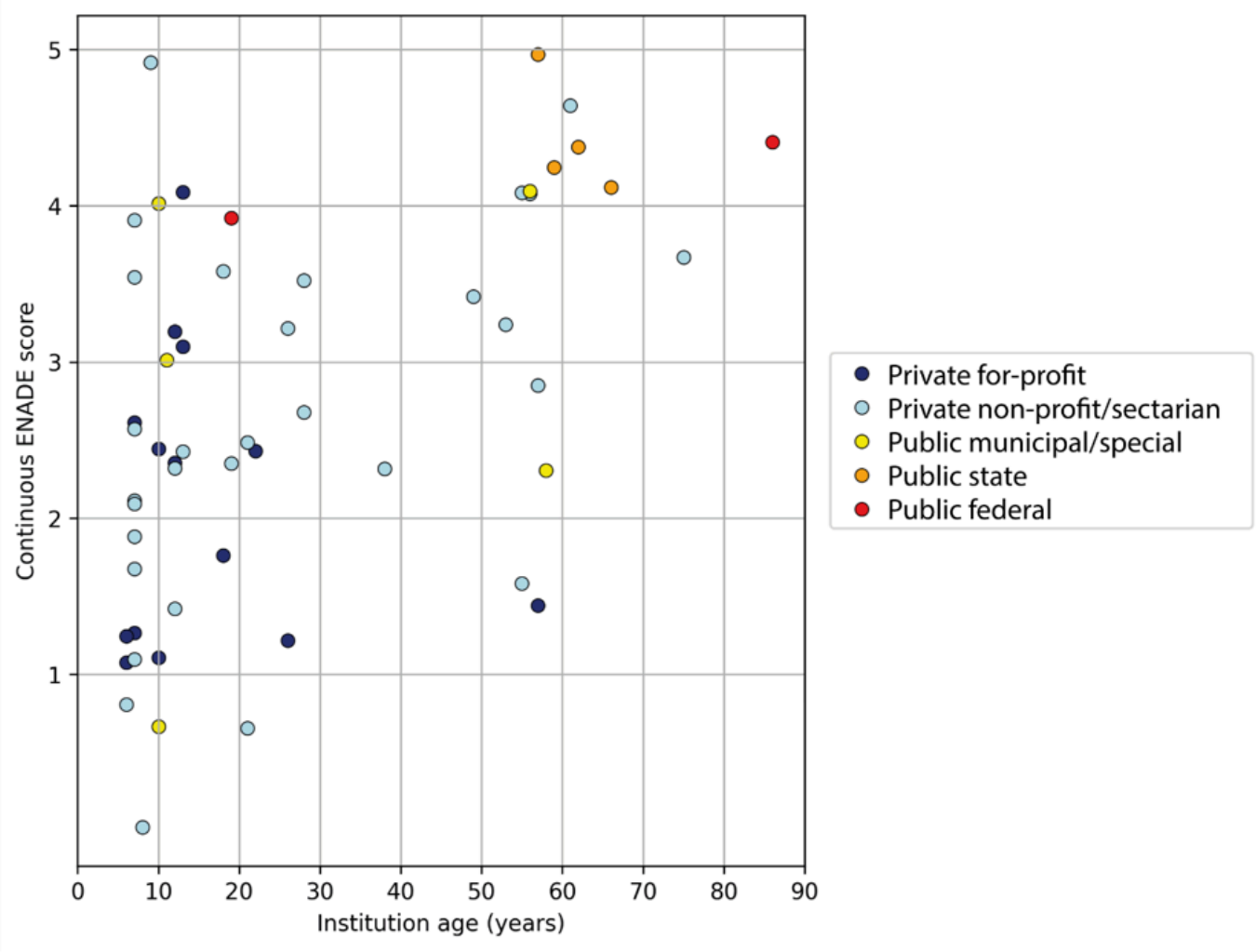


Figure 4

Distribution of student´s performance scores (ENADE) according to the year of establishment of medical schools, categorized by administrative type.