Reasons for choosing the profession and profile of newly qualified physicians in Brazil

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Summary

Objective: To evaluate the socio-demographic profile, path to medical school admission and factors affecting the choice of becoming a physician in Brazil.
Method: Application of a structured questionnaire to 4,601 participants among the 16,323 physicians who graduated between 2014 and 2015 that subsequently registered with one of the 27 Regional Boards of Medicine (CRMs).
Results: The average age of participants is 27 years, 77.2% are white, 57% come from families with a monthly income greater than ten times the minimum wage, 65% have fathers who have completed higher education, 79.1% attended a private high school, and 63.5% selected the "will to make a difference in people's lives or do good" as their main reason for choosing medicine, with some differences between the sexes and matriculation at a public or private medical school.
Conclusion: The recent politics for educational diversity and the opening of additional medical schools has not yet had an impact on the socio-demographic profile of graduates, who are mainly white, wealthy individuals.

Keywords: physicians, undergraduate medical education, career choice, demographics.

Introduction

The number of new physicians has reached record levels in several countries in the world that have reformed their training strategies and the provision of such professionals in order to provide a better response to the current needs of these populations and health systems. This progress is more clearly verified in countries that have opened up new courses and increased the number of students admitted to medical schools.[1]

The problem of a widespread insufficiency or shortage of physicians is accompanied by concerns about adequate training, and the profile and motivations of the new generations of professionals who are entering the labor market.

Brazil has also seen a recent significant increase in the amount of qualified physicians, which is a result of programs and policies that aim to focus not only on supply of these professionals, but also their training, distribution and fixation. Law no. 12,871[2] was approved in 2013, and its constituent parts provides for the opening of undergraduate courses in medicine, expansion of medical residency admissions, the provision of physicians in underserved locations and new guidelines for medical training.

Brazil has approximately 425,000 active physicians, which is the equivalent to a rate of around two physicians per 1,000 inhabitants, which is below the average in European countries and distributed unevenly both within the territory and between the public and private health sectors.[3]

For better planning, forecasting and decision-making in relation to the medical workforce, we need to understand the national characteristics and dynamics through multiple sources, including population censuses, surveys with physicians, administrative bases of employers and health services, as well as data relating to medical schools, training, trade associations, licensing and registration.

These efforts could be focused on referential medical demography studies[3-6] that consist of approaching the

population of physicians considering factors such as age, gender, territorial mobility, pay, links, workload, production, inclusion in the health system, behaviors, and the practices of these professionals.

Several national and international studies have outlined the profile of physicians, medical students and former medical school students, highlighting sociodemographic variables such as gender, household income, parental education, training prior to graduation, as well as opinion polls about medical education and career prospects.

In Brazil, in addition to other studies, the characteristics of medical students at State University of Rio Grande do Norte,[7] at the Federal University of Minas Gerais[8] and at the Federal University of Espírito Santo[9] have been studied. A profile has also been outlined of former students graduating from the Medicine Course at the Lutheran University of Brazil – Ulbra, in Porto Alegre,[10] the Medical School of the ABC,[11] the University of São Paulo (USP) Medical School,[12] the Botucatu Medical School,[13] and the medicine course of the State University of Londrina.[14] Meanwhile, the Ministry of Education has produced reports[15] using the data reported by medical students during the National Student Performance Exam (ENADE, in the Portuguese acronym).

However, there is a gap in current national research aimed at outlining the profile, perceptions and motivations of newly qualified physicians. This is the purpose of the following study.

Method

This article is part of the research "Profile and perceptions of new graduates in medicine in Brazil", a survey study aimed at the production of quantitative descriptions of a certain target population.[16] The research has a national scope and involved the application of an optional structured questionnaire, with the eligible and potential participants including all recently qualified physicians registered with one of the 27 Regional Boards of Medicine (CRMs) in Brazil.

The study was performed in two stages. In the State of São Paulo, between September 1, 2014 and August 31, 2015, it followed the registration calendar of new physicians at the Regional Board of Medicine in the State of São Paulo (Cremesp) and had the purpose of testing the operation of the research's online platform on a larger scale, as well as the level of adherence and completeness of the questionnaire. In other units of the Federation the survey took place between November 1, 2014 and October 31, 2015, at the time of registration of new physicians at the CRMs.

The study was approved by the USP Medical School's Research Ethics Committee (CEP) under number (Report 797.424. 9/3/2014).

Instrument

The definition of the format, content and means of applying the questionnaire was based on similar studies[17-24] and methodological manuals[25,26] dealing with this technique. A structured questionnaire was prepared with 104 closed, multiple choice questions grouped into thematic blocks aimed at outlining the demographic profile, as well as studying the perceptions of graduates from medical courses in Brazil about graduation, career, the health system and aspects of medical ethics.

This article includes the results relating to the demographic profile of the new graduates, their entry route, and choice of medical school. The remaining results will be discussed in due course.

After a pilot test with sixth-year medical students, the final version of the questionnaire was deployed in an online platform and applied experimentally in São Paulo for one week, allowing us to assess the actual time requirements and to improve the technical aspects of online completion of the questionnaire.

Data processing

In order to understand the range of new graduates, of whom the participants represented a fraction, we worked with data from the total number of graduates registering with the CRMs in the research period, in accordance with the database provided by the Federal Board of Medicine.

All entries in the database of participants who had no corresponding record in the database of the target population were excluded.

Three stratification variables were used: 1) Sex; 2) Public or private nature of the undergraduate medical school; 3) Major regions of the country, according to the undergraduate medical school.

The number of participants varied between questions and within each stratum. Therefore, we chose to design the analysis equivalent to that of a complex sample (stratified), taking into account the percentage of the different strata in the target population in order to adjust the results. As such, the representativeness of each stratum in the analysis was guaranteed. The confidence intervals for the frequencies were calculated by bootstrapping with 1,000 resamples.

Results

After eliminating inconsistencies such as duplicate taxpayer numbers, registration errors and lack of data regard-

ing the sex or training institution, the target population reached 16,323 eligible newly qualified physicians, all of whom were invited to participate in the study.

The questionnaire was answered by 5,785 individuals. 1,184 participants without registration at the CRMs in the one-year period determined by the study were disregarded. At the end, 4,601 subjects participating in the study were analyzed.

Table 1 presents the distribution of the target population (all new graduates registered at the CRMs) and the participants in the study, according to the strata defined, with the respective confidence intervals. Figure 1 shows the percentage of respondents (joining the study) for each Unit of the Federation in relation to the physicians trained in the same period for each state.

The study allowed us to study the sociodemographic profile of new graduates in medicine in Brazil. These graduates are, on average, 27 years of age, with 16.8% aged up to 24 years, 68.4% aged from 25 to 29 years, and 14.8% aged 30 years or more. Graduates from public universities are significantly younger than those from private universities ($p<0.001$).

Around 91% of new graduates are single and 93.5% do not have children. A total of 85.6% described their situation at the end of medical school as someone who still does not work and is "financed by the family". Around 56% stated they lived with parents or relatives, and 17.8% with friends. A total of 77.2% of respondents consider themselves to be white. This percentage reaches 89.5% in the South region, 80.9% in the Southeast, and falls to 54.2% in the Northeast and 53.7% in the North. Only 1.8% of participants in the study declared themselves to be black, and 16.2% to be pardo (Table 2).

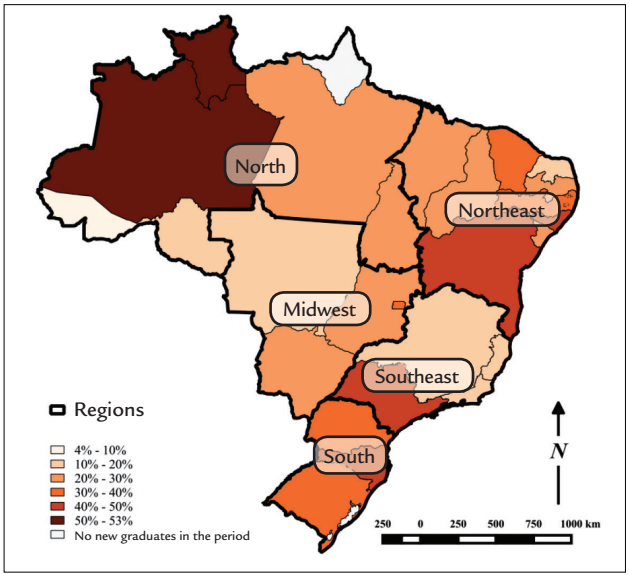

FIGURE 1 Distribution of respondents among the population eligible for the study according to State.

TABLE 1 Distribution of new graduates registered with the CRMs and the participants in the study, according to sex, major region and nature of the undergraduate school.

Strata	N of physicians enrolled with the CRMs	%	N of study participants	% (95CI)
Sex				
Male	7,418	45.4	2,168	47.1% (45.8-48.5)
Female	8,905	54.6	2,433	52.9% (51.5-54.2)
Major region				
South	2,435	14.9	884	19.2% (18.1-20.3)
Southeast	8,172	50.1	1,996	43.4% (42.0-44.8)
Midwest	930	5.7	248	5.4% (4.7-6.1)
North	1,433	8.8	415	9.0% (8.2-9.8)
Northeast	3,353	20.5	1,058	23.0% (21.8-24.2)
Nature of the medical school				
Public	6,294	38.3	2,072	45.0% (43.6-46.6)
Private	10,029	61.4	2,529	55.0% (53.4-56.4)
Total	**16,323**	**100**	**4,601**	**100**

Just over a third of the graduates (35.4%) come from families with a monthly income between three and ten minimum wages (Table 2). The families of the other 29.0% have a monthly income between 11 and 20 minimum wages. More than a quarter (28.3%) are children of families who earn more than 21 minimum wages per month. Among the graduates trained at schools in the North of the country, 14.8% are from families who earn up to three monthly minimum wages. Those who graduated from private medical schools come from families with a higher monthly income: 31.2% of these are above 21 minimum wages, compared to 20.4% of graduates from public medical schools with the same range of family income.

In relation to the level of education of relatives, the fathers of 65% and the mothers of 69.4% had completed higher education (Table 3). Around a third of the graduates (32.6%) had a physician in the family, considering just parents, siblings and/or spouse. Among those educated at public schools, 25.8% have physicians in the family, with the proportion reaching 35.1% among those educated at private schools.

The study verified whether new graduates in medicine attended secondary education at public or private school, and if they attended entry examination preparatory courses (Table 4). A total of 79.1% reported having completed secondary education at private school. Among graduates from private medicine courses, 80.3% completed secondary education at private school, compared with 75.6% of graduates from public medical schools. Only 16.6% did not undergo a preparatory course for the entrance exam. The South region has the highest percentage (88.9%) of students who attended "preparatory courses". In the country as a whole, 43.6% took the "preparatory course" for 2 years, and 18.6% for 3 years or more.

The vast majority of respondents – 88.3% of them – were admitted to the medicine course through the traditional entrance exam. Another 4.1% used the National Secondary Education Exam (ENEM) to complement their score. The Unified Selection System (SISU) and Quota Law were resources cited by 1.7% of those studying at public medical schools.

Less than half of the graduates from private schools (47.6%) received some type of scholarship or funding to cover the cost of the medicine course. In this group, 33.1% were benefited by the Higher Education Student Financing Fund (FIES) and 8.0% by the University for All Program (PROUNI). Around 5.1% received a full or partial scholarship from the medical school itself or an external institution. Among those who attended public medical school, 92.4% did not receive a scholarship, financing or financial aid of any nature during the course.

In the study, the question "why I took Medicine" offered alternative responses and enabled multiple choices (Table 5). The main reason for choosing the profession, as indicated by 63.5% of the new graduates, was "the desire to make a difference in people's lives or to do good", while 54.5% indicated an "interest in the study of the human body and disease".

There is a difference in the expectations of graduates from public and private universities. Among the graduates

TABLE 2 Distribution of new medicine graduates according to self-reported color/race and range of monthly family income.

Do you consider yourself to be?		
White	3,327	77.2%
Black	104	1.8%
Pardo/mulatto	951	16.2%
Yellow/Asian	168	4.4%
Indigenous	22	0.4%
Total	4,572	100%
What is the range of your family's monthly income?		
Up to 3 minimum wages	350	7.3%
3 to 10 minimum wages	1,601	35.4%
11 to 20 minimum wages	1,329	29.0%
21 to 30 minimum wages	612	15.1%
More than 30 minimum wages	544	13.2%
Total	4,436	100%

TABLE 3 Distribution of new graduates in medicine according to father and mother's level of education.

	Father's level of education		Mother's level of education	
No schooling	29	0.5%	12	0.3%
Elementary from 1st to 4th years	246	5.3%	134	2.8%
Elementary from 5th to 8th years	299	6.5%	202	4.5%
High school	1,115	22.9%	1,115	23.0%
Higher education	2,806	64.8%	3,039	69.4%
Total	**4,495**	**100%**	**4,502**	**100%**

at public medical schools, 36.4% stated they had studied medicine "due to the potential pay" of the profession. Among graduates at private schools, this percentage drops to 25.2%. When the answers are grouped by sex, we can see that women responded more to the choices "to do good" (66.2% *versus* 59.3% among men) and "interest in the physician/patient relationship" (45.3% *versus* 35.4%). Male participants attributed the choice more to the "prestige of the profession" and the "potential pay" – with the latter justification cited by 37.5% of men *versus* 22.2% of women.

There is a difference in the motivations indicated to choose the profession according to level of income. The reasons "due to family influence or advice" and "interest itself/intellectual challenge" were more common among higher income graduates (p<0.001 and p=0.021). Meanwhile, "interest in the study of the human body and disease" was indicated more by lower income graduates (p=0.010). The reason "due to family influence or advice" was more common among graduates who have a physician in the family (p<0.001). Graduates without a physician in the family were more likely to indicate the reasons "interest in the study of the human body and disease" (p=0.014) and "desire to make a difference in people's lives or to do good" (p=0.010).

All of the indicators raised in the study were stratified by sex, major regions and according to the public or private nature of the medical schools.

Discussion

Newly qualified physicians in Brazil are whiter and richer than the general population, and the vast majority is

TABLE 4 Distribution of new graduates in medicine according to the public and private nature of the undergraduate school and the school where they completed secondary education, and according to the attendance at the entrance exam preparatory course.

	Educated at public school		Educated at private school		Total	
	n	Freq.	n	Freq.	n	Freq.
What kind of secondary education school did you attend?						
All or mostly public school	431	19.8%	345	13.4%	776	15.1%
Half in public school and half in private school	18	0.8%	15	0.7%	33	0.8%
All or mostly private school	1,542	79.4%	2,044	85.9%	3,586	84.2%
Total	1,991	100%	2,404	100%	4,395	100%
Did you attend an entrance exam preparatory course?						
I did not attend a preparatory course	268	13.7%	440	17.7%	708	16.6%
Yes, I attended the course for 1 year or less	663	31.9%	1,021	42.5%	1,684	39.7%
Yes, I attended the course for 2 years or more	1,055	54.5%	942	39.8%	1,997	43.6%
Total	1,986	100%	2,403	100%	4,389	100%

TABLE 5 Distribution of new graduates in medicine, according to reason for choosing the profession.

Reason for choosing medicine	Female	Male	p-value	Public	Private	p-value	Total
Due to the desire to make a difference in people's lives or to do good	1,554 (66.2%)	1,196 (59.3%)	<0.001	1,249 (64.1%)	1,501 (63.3%)	>0.050	2,750 (63.5%)
Due to the interest in studying the human body and disease	1,285 (55.6%)	1,040 (52.8%)	>0.050	1,086 (56.8%)	1,239 (53.7%)	>0.050	2,325 (54.5%)
Due to the interest in the physician/patient relationship	1,022 (45.3%)	711 (35.4%)	<0.001	759 (40.0%)	974 (42.0%)	>0.050	1,733 (41.5%)
Due to the interest itself/intellectual challenge	884 (35.0%)	1,009 (45.7%)	>0.050	979 (49.7%)	914 (35.4%)	0.002	1,893 (39.2%)
Due to the potential of pay	553 (22.2%)	797 (37.5%)	<0.001	696 (36.4%)	654 (25.2%)	0.047	1,350 (28.2%)
Due to the prestige of the profession	410 (17.5%)	636 (31.2%)	<0.001	508 (26.6%)	538 (21.4%)	>0.050	1,046 (22.8%)

young, single and has no children, and is financially dependent on their parents and still living with them. A third of new graduates have medical "lineage", that is, they have a physician in the family, corroborating studies conducted with medical students in the country.[9,27] In accordance with self-reported race/color, only 1.8% of newly qualified physician in Brazil declared themselves to be black, and 16.2% pardo. The scenario is quite different from that observed in the population, in which 7.6 and 43.1% declare themselves to be black and pardo, respectively.[28] Among newly qualified physicians, 77% are white, which is around 20% more than the 48% of the Brazilian population that declare themselves to be white.[28]

Studies[7,9,27] have already indicated that medical students are, for the most part, proportionately whiter than the population. The situation is different, for example, than that of South Africa[29] and Colombia,[30] where the profile of medical students is closer to the ethnic distribution of the general population.

In Brazil, other undergraduate courses such as Law, Dentistry, Psychology and Veterinary Medicine also have a proportion of whites above that recorded in the general population.[31] Meanwhile, among participants in the ENEM as a whole, the ethnic distribution has been increasingly similar to that of the population.[32]

Certain socioeconomic indicators of new graduates in medicine are concordant: most come from families with a high monthly income, completed secondary education at private school, took a private preparatory course for the entrance exam, and have parents who completed higher education.

57.3% of the participants in the study have a household income of over 10 minimum salaries, a proportion that is eight times higher than in the general population, where 7.6% are in this income range.[33]

Another factor revealing inequality is the percentage of newly qualified physicians (merely 20%) who completed secondary education at public school. In Brazil, secondary education is predominantly public and represents 87% of enrollments.[34]

In higher education in Brazil, in general, students are predominantly from public schools but study undergraduate courses at private education institutions.[15] The pattern is therefore distinct in medicine.

The traditional entrance exam was the predominant mode of admission for the medicine course (to 88%), almost always proceeded by a preparatory course. Only 17% did not take the "preparatory course" and 60% did so for 2 or more years.

Various policies are currently underway in Brazil seeking to promote inclusion in higher education. Aimed at the private education sector, since 2001 there has been the Higher Education Student Financing Fund (FIES) and the University for All Program (ProUni) launched in 2005, which provides full or partial scholarships to students with a low family income of up to 3 minimum wages. Meanwhile, the SISU was created in 2010 as an alternative to the traditional entrance exam at public universities, using the results of the ENEM as selection criteria, as well as other affirmative measures. Furthermore, Law no. 12.711/ 2012[35] determined that federal universities must reserve at least 50% of their admissions for students coming from public schools and low income students.

Among newly qualified physicians at public medicine courses, only 1.6% was benefited by the SISU or the Quota Law. Meanwhile, among graduates at private medical schools, 33.1% used the FIES and 8.0% used the ProUni. It is worth noting that the participants in this study, who graduated in 2014 and 2015, began their studies 6 years earlier, when these inclusion mechanisms were still not widely practiced or did not include medicine courses. However, these measures have limitations, given that the quota policy is restricted to public education, students shoulder disproportionate costs to their conditions under the FIES, and the ProUni, which is restricted to tax exemption linked to the scholarships granted, has expanded much less than the demand.[31,36] It is possible to adjust the academic metrics to increase socioeconomic, racial and ethnic diversity among undergraduate students of medicine.[37]

By analyzing the motivations for choosing the medical profession, it can be noted that there was a prevailing consent for humanitarian issues among the new graduates, such as "helping people", "doing good" and the "physician/patient relationship". To a lesser extent, there is reference to the "potential pay" of the profession and the "prestige of the profession".

It is noteworthy that new graduates from public schools expressed a greater interest in the financial return of the profession than their peers educated in private courses. Historically linked to the social rise of popular strata,[38] in contrast, the medical profession is currently chosen by individuals located in higher income strata who, as can be seen, mainly studied secondary education at private schools, with many completing their medical degree at public universities.

When the responses are grouped by sex, we see that the choice of medicine by new graduates that are women has a greater social component. They are more likely to indicate "doing good" and the "interest in physician/patient relation-

ship" while reported the "prestige of the profession" and "potential pay" more often. As such, it is worth noting that studies using gender theory outline the traditional female identity as more accustomed to caring and being concerned about the care of others when compared to male identity. The male gender is indicated by the literature as having a dominant pattern linked to competitiveness, and the condition of provider to women, children or the elderly. Thus, men tend to focus on issues of professional success, competing more in the market, or concern with gaining the income they deem necessary.[39-43]

There are also other gender and generational effects on the choice of medicine, which have repercussions on the definition of career and professional realization.[44] For example, young female physicians acknowledge motivations and practices also aimed at including better reconciliation between personal and professional life.[45] Changes in how medical work is conceived, organized and valued have been identified as being necessary to combat gender inequalities in medicine, which are translated into lower pay and a lower presence of women in medical specialties and leadership positions in medicine.[46]

In the study's target population, women are the majority (54.6%) among new graduates, in keeping with historical patterns worldwide towards a progressive reduction in quantitative differences in education and employment in general.[47] In Brazil, around 7% of physicians are male, but since 2011 the number of women has surpassed men among the total registrations of new physicians,[3] following a trend towards feminization of medicine already recorded by various countries.[48] However, this trend is not homogeneous. In studies with medical students, the female presence ranges from 22.4% in the medical course at the Federal University of Espírito Santo[14] to 50.2% at the State University of Londrina,[9] while in foreign studies this ranges from 48% in the United States[49] to 67.1% in the United Kingdom.[50]

Given the different values expressed by women and men in relation to their reasons for choosing the profession, the study raises new investigations into the possible impacts of the feminization of medicine in Brazil. Will medicine become a profession focused more on care and less valued for professional success? Or will women tend towards the more traditional male values that have prevailed in the profession throughout their careers, given the fact that until recently this was a male profession?

There are limitations in the study. There are significant differences between the frequency of the strata in the target population and between participants, which required adjustments. However, there is no way to estimate the possibility of bias, considering the different adhesion rates between strata. There was also a significant amount of participants in the study with no correspondence in the target population database and who were therefore disregarded. These improper entries may possibly be attributed to those registered with the CRMs and who answered the questionnaire but were not new graduates but rather physicians that were ineligible for the study and had requested secondary registration due to transfer of their state of domicile.

Conclusion

Entry into medicine in Brazil privileges white individuals and those who have a better socioeconomic situation. Although there has been a significant increase in the number of medical courses and admissions in recent years, reconciling this expansion with the democratization of access to medical education is a major challenge.

Educational policies of inclusion, quotas and affirmative measures that aim to promote equal access to higher education have not yet had an impact on changing the profile of physicians trained in Brazil. Medical training remains elitist and inaccessible to certain strata of the population, partly for being more competitive or expensive, among other factors, as well as being marked by competition in entrance exams for public courses and high tuition fees in private courses.

Now the majority of new graduates, women have different characteristics and motivations than those expressed by men, which places the feminization of medicine as a relevant topic for future research.

It is hoped that the elements raised by this study can contribute to outlining a broader research agenda aimed at a better understanding of the dynamics of the medical profession which, ultimately, has repercussions on the organization and operation of the health system.

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Resumo

Motivos de escolha da profissão e perfil de médicos recém-graduados no Brasil

Objetivo: traçar o perfil sócio-demográfico de recém-graduados em medicina no Brasil, a forma de ingresso na graduação e os motivos de escolha da profissão médica.

Método: aplicação de questionário estruturado em 4.601 participantes, dentre 16.323 médicos formados entre 2014 e 2015, que se registraram em um dos 27 Conselhos Regionais de Medicina (CRM), considerados a população-alvo do estudo.
Resultados: a idade média dos recém-graduados é de 27 anos, 77,2% são brancos, 57% vêm de famílias com renda mensal acima de dez salários mínimos, 65% têm pais com educação superior, 79,1% cursaram ensino médio em escola particular e 63,5% apontaram a "vontade de fazer diferença na vida das pessoas ou fazer o bem" como principal razão para a escolha da medicina, com diferenças entre sexo e natureza pública ou privada da escola de graduação.
Conclusão: as políticas no Brasil de inclusão educacional e de abertura de escolas médicas ainda não tiveram impacto no perfil dos recém-formados em medicina, em sua maioria indivíduos brancos e de maior nível socioeconômico.

Palavras-chave: médicos, educação de graduação em medicina, escolha da profissão, demografia.

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