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# Undergraduate programs for health professionals in Brazil: an analysis from 1991 to 2008

## ABSTRACT

Study conducted to support the planning and implementation of public policies on human health resources. Fourteen undergraduate health courses were analyzed: biomedicine, biological sciences, physical education, nursing, pharmacy, physical therapy, speech and language therapy, medicine, veterinary medicine, nutrition, dentistry, psychology, social work and occupational therapy between 1991 and 2008. Data on number of students admitted, college admission rates, rates of graduating student by inhabitant, gender, geographic area and family income were collected from the Brazilian Ministry of Education database. For medicine undergraduate programs there were 40 applicants per place at public institutions and 10 at private ones. Most students admitted were females. The Southeast region concentrated 57% of graduating students. The study revealed trends that indicates opportunity inequalities in the regional distribution of health professional education, thus supporting the need for policies aimed at reducing such inequalities.

**DESCRIPTORS: Education, Higher. Health Personnel. Health Manpower. Human Resources Formation. Educational Measurement.**

## INTRODUCTION

The 1988 Brazilian Constitution established as a mission of the *Sistema Único de Saúde* (SUS – National Health System) to manage training of human resources for health, as set forth in Article 200, paragraph III (BRAZIL).<sup>1</sup> The Brazilian Ministry of Health, through the Department of Health Education Management (DEGES) of the Secretariat of Health Workforce and Education (SGTES), has developed and supported various activities for the training and development of health professionals.

The training and skills development of human resources in health, in accordance with priority policies of the Brazilian Ministry of Health, have incorporated the current policy through an intersectoral action with the Brazilian Ministry of Education and the Brazilian National System of Higher Education, first provided in the Interministerial Decree No. 2118 of November 3, 2005<sup>XXIII</sup> and, more recently, in the Presidential Decree of June 20, 2007, which established the Interministerial Commission for Health Education within the Ministries of Education and Health.<sup>a</sup>

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This joint action has produced a preliminary study in the form of a publication about the history of undergraduate health programs (Haddad et al<sup>9</sup>) covering the period from 1991 to 2004.

This article presents an updated overview on 14 undergraduate programs in health according to the National Health Council (CNS) Resolution<sup>xxii</sup> in Brazil. The programs included: biomedicine, life sciences, physical education, nursing, pharmacy, physical therapy, speech and language therapy, medicine, veterinary medicine, nutrition, dentistry, psychology, social work and occupational therapy. The study covers the period between 1991 and 2008.

### **Human resources: a critical factor for the production of health services**

Human resources are a key issue in the agenda of health policy for the implementation of national health systems. Health systems have faced challenges regarding to both quantitative (number and distribution and retention of providers) and qualitative aspects of training. These issues have been currently discussed and government interventions have been implemented for training and professional development, and they reflect ongoing lack of coordination in the implementation of social policies involving education and provision of health services.

A marked shift in training occurred in the 1960s–1970s with the boom of higher education between 1965 and 1975. There was an extraordinary growth of higher education in all professional areas in Brazil and in other Latin American countries as well, with the multiplication of schools and number of admissions. The Brazilian university reform was implemented during this period as a result of a long process of discussion about the need for a new higher education system adjusted to a “modernizing” policy for greater efficiency and productivity and increased number of applicants for this training. It is a period also marked by an expressive pursue for prestige and social advancement among middle class people who strongly pushed for the development of higher education in the context of economic progress of Brazil.

In health, this training was largely driven by studies and meetings at that time to establish population milestones and number of physicians, and to encourage the training of nurses and qualification of basic and middle level staff. The Alma Ata Conference (WHO, 1978) proposed a focus on the primary health care (PHC) strategy as a means of achieving “Health for All by the Year 2000”.

Between 1965 and 1970, 33 new medical schools were opened in Brazil with government support. In part, this was a result of the expansionist policy concerning education as well as of the pressure from the medical sector for more university places.

The interdisciplinary aspects of training, teaching-care integration and incorporation of educational technologies to health education were subjects included in the agenda for discussion in forums funded by international agencies. New professions and boards were created and regulated in the 1960s and 1970s and incorporated into the health sector such as physical therapy, occupational therapy and nutrition.

The contents and recommendations on the matter underscored their prescriptive nature but without taking into consideration aspects of relevance, feasibility and policies implemented in the education sector, particularly in health. Furthermore, the expansionist policy for the education has reshaped the job market in the area and, despite following the trends of “expansion,” it has brought about an imbalance between supply and demand. This imbalance has had the practical consequence of lowering pay, which in turn has made the strongest categories, such as doctors, to engage in various forms of multiprofessional practice.

Increased supply and demand, determined by individualized, education or care model actions, have accentuated regional imbalances of training opportunities and jobs. Moreover, the demographic and epidemiological transition has changed population needs and demands for health care. This scenario indicates an urgent need for integration between training and organization of health system.

It should also be noted that this transformation process is not sectoral but a result of crises arising in different social layers. With respect to the organization of production, the labor market, work processes and consumption patterns have become more flexible, requiring more skilled workforce with more intellectual and abstract qualifications to solve problems and deal with constantly changing situations.

In terms of provision and organization of health services, the crisis manifested in the contradiction between the dominant conception that views health in terms of biology, and the conception of health as building society, an expression of quality of life. The former focuses on disease and medicalization with strong medical predominance, and the latter is based on intersectoral actions and people’s empowerment.

Traditional education conceptions of knowledge transmission contrapose to the emergence of critical, reflective concepts that examine the social reality. In addition, training institutions, especially medical schools, have been proposing a review and reformulation of training to incorporate costly high-complexity technological knowledge into both diagnostic and therapeutic practices, perpetuating traditional models of content selection and course-hours based on the relevance of specialties.

As for health policies, the introduction of different relationship modalities with the Brazilian administration regarding health service provision and the implementation of new care models, such as the Family Health Strategy (FHS), reflect a major expansion of the job market and represent a growing challenge for the human resources area. These challenges include both quantitative (number and distribution of health personnel) and qualitative aspects (training opportunities).

In a country of large geographic extent such as Brazil, the integration between health and education has been a strategic factor in policies aimed at extended coverage in terms of availability and regional distribution, which may secondarily influence health provider retention. One of the barriers for strengthening FHS teams is the high turnover rate of health providers.

## STUDY DESIGN AND DEVELOPMENT

The values and principles supporting the analysis and considerations presented in this study included:

- (1) the principles of the Brazilian health reform consisting of the technical, political and social process that established health as a right and duty of the state;
- (2) the principles of the SUS set forth in the 1988

Constitution and the Organic Health Law;<sup>III</sup>

- (3) the grounds of Brazilian higher education expressed in the Directives and Bases of Higher Education<sup>IV</sup> in National Education Plan,<sup>V</sup> and the National Assessment System of Higher Education (SINAES),<sup>VI</sup>
- (4) the proposed reform of higher education coordinated by the Brazilian Ministry of Education (MEC) outlined in Decree No. 5773 of May 2006.<sup>VII</sup>

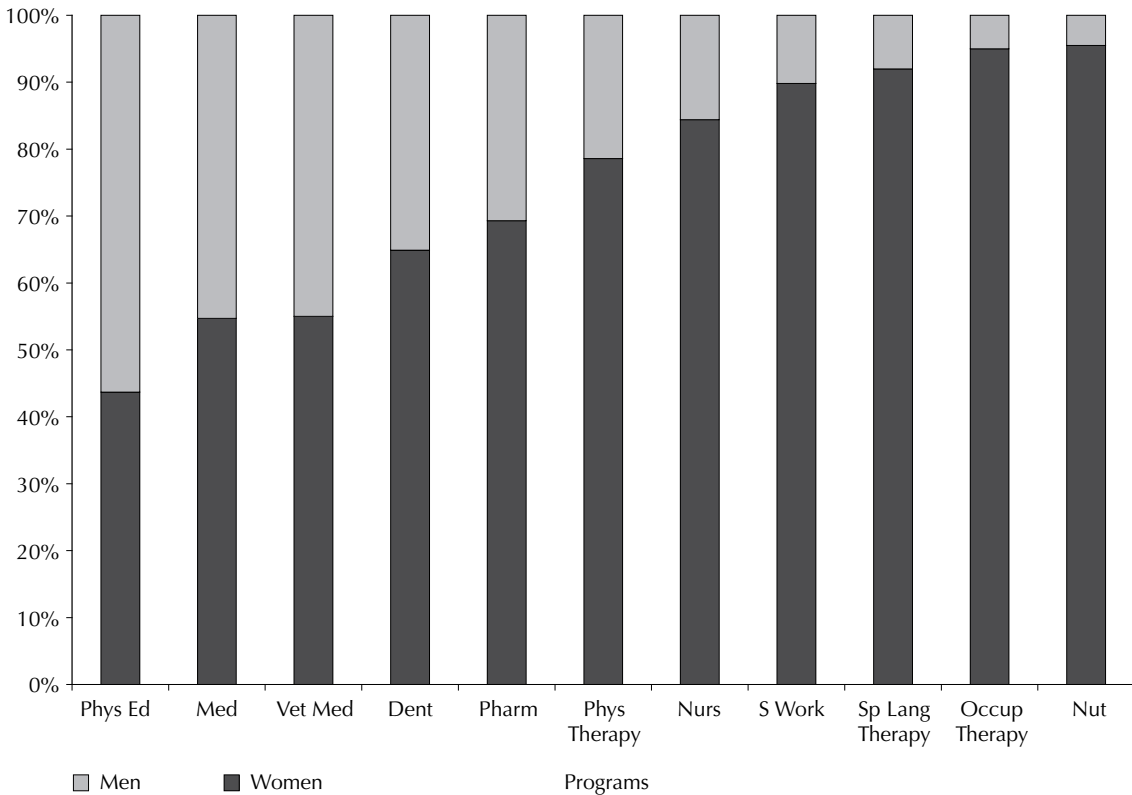
The National Curriculum Guidelines (DCN)<sup>VIII-XXI</sup> of these 14 undergraduate programs for health professionals indicate a need to incorporate into their educational plans the theoretical framework of SUS with emphasis on ethical principles, empowerment, epidemiology and health-disease-care process to ensure training in accordance with current national and international standards of quality. The DCN are innovative as they promote early, progressive inclusion of students in the SUS to gain knowledge and assure commitment to the local and national health reality.

In addition to the values and principles mentioned before, training should take into consideration social, political and cultural issues to ensure a thorough understanding of the network of meanings of human phenomena, health and education conditions and regional diversity.

**Table 1.** Distribution of admissions by program and administrative category of education institutions. Brazil, 2004, 2006 and 2008.

Programs	Admissions 2004				Admissions 2006				Admissions 2008			
	Public	%	Private	%	Public	%	Private	%	Public	%	Private	%
Biomedicine	647	9.6	6,064	90.4	1,186	7.7	14,156	92.3	1,786	7.6	21,636	92.4
Biological Sciences	36,874	40.3	54,617	59.7	40,572	39.0	63,500	61.0	46,247	42.4	62,932	57.6
Physical education	31,611	23.1	104,994	76.9	33,694	19.5	138,675	80.5	38,392	20.7	147,350	79.3
Nursing	21,807	18.0	99,044	82.0	24,181	12.9	162,774	87.1	27,455	12.2	196,875	87.8
Pharmacy	16,537	27.0	44,740	73.0	16,948	21.2	62,857	78.8	17,921	19.0	76,421	81.0
Physical therapy	7,771	8.1	87,978	91.9	8,089	7.6	97,779	92.4	8,552	8.1	96,869	91.9
Speech and language therapy	1,812	13.8	11,311	86.2	1,858	16.0	9,719	84.0	2,067	21.8	7,397	78.2
Medicine	33,864	52.1	31,101	47.9	35,987	48.6	38,047	51.4	38,000	44.4	47,567	55.6
Veterinary medicine	13,242	38.2	21,415	61.8	13,971	35.0	25,957	65.0	15,110	34.9	28,216	65.1
Nutrition	7,017	18.0	31,912	82.0	8,324	16.3	42,700	83.7	9,795	16.8	48,417	83.2
Dentistry	15,956	34.7	30,083	65.3	16,532	35.4	30,161	64.6	17,214	35.3	31,538	64.7
Psychology	15,416	16.3	79,085	83.7	16,052	15.2	89,321	84.8	16,927	14.4	100,852	85.6
Social work	12,188	33.7	23,937	66.3	12,691	26.5	35,176	73.5	13,257	23.0	44,474	77.0
Occupational therapy	1,121	20.8	4,264	79.2	1,428	24.9	4,299	75.1	1,620	33.0	3,282	67.0
Total	215,863	25.5	630,545	74.5	231,513	22.1	815,121	77.9	254,343	21.8	913,826	78.2

Source: Brazilian Ministry of Education/Anísio Teixeira National Institute for Education Research and Studies/ Board of Education Statistics, Higher Education Census, 2004, 2006 and 2008



Source: Brazilian Ministry of Education/ Anísio Teixeira National Institute for Education Research and Studies/ Secretariat of Health Workforce and Education/ National Examination of Student Performance 2007

**Figure 1.** Proportion of female participation among graduating students in health programs. Brazil, 2007.

The data sources for this study included the National Examination of Student Performance (ENADE)<sup>b</sup> (MEC); ENADE student questionnaire; the Higher Education Census; the 2008 Register of Higher Education Institutions, Programs and Teachers (MEC) from the Anísio Teixeira National Institute for Education Research and Studies (INEP/MEC).<sup>c</sup>

## ANALYSIS AND RESULTS

The Brazilian higher education system is predominantly private (70–80%). The predominance of private institutions is also seen in health as shown in Table 1, especially in biomedicine, physical therapy, nursing, psychology, and nutrition. In six out of the 14 health programs studied, the admission rate in the public sector was higher than the national average of 21.8%. In medicine, the number of admissions in public institutions in 2004 was greater than that in the private ones; however, there was a shift from 2006 and more than 50% of admissions in medicine were in private institutions.

Demand for health programs remained high, especially in the public sector, showing a strongly positive applicant/place ratio (16.2 vs. 1.9 in the private sector). For medicine, in 2008, this ratio was 40.4 and 10.8 applicants per place in public and private institutions, respectively.

The increase in the number of graduates in the 14 health programs were aligned with specific population demands in the states and Brazilian regions as our data showed considerable regional differences in the number of graduates per inhabitant. The highest rates of graduates per inhabitant were seen in the South and Southeast regions and the lowest rates were seen in the North and Northeast regions. Table 2 shows data regarding medicine, pharmacy and nutrition.

The average rate of places filled was higher than the national average (50.2%) in nine of the 14 health programs studied. The lower rate of places filled was in speech and language therapy program (25.7%) and the highest rate was in medicine (98.9%) (Table 3).

<sup>b</sup> Ministério da Educação. Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. Exame Nacional de Desempenho dos Estudantes. Relatório – ano 2007. Brasília; 2007[cited 2008 Oct 10]. Available from: <http://www.inep.gov.br/superior/enade/2007/relatorios.htm>

<sup>c</sup> Ministério da Educação. Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. Censo da Educação Superior, 2007. Brasília; 2007[cited 2008 Oct 10]. Available from: [http://www.inep.gov.br/superior/censosuperior/relatorio\\_tecnico.htm](http://www.inep.gov.br/superior/censosuperior/relatorio_tecnico.htm)

**Table 2.** Distribution of graduating students in pharmacy, medicine, and nutrition per inhabitant by region, Brazil, 2006 and 2008

Região	Population			Pharmacy			Medicine			Nutrition				
	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008		
Brazil	187,228	189,953	12,114	13,394	15,456	14,182	10,381	10,825	18,036	17,296	7,118	9,282	26,303	20,465
North	15,080	15,327	559	471	26,977	32,541	442	743	34,118	20,629	375	433	40,213	35,397
Northeast	51,713	53,493	1,108	1,156	46,672	46,274	1,584	1,708	32,647	31,319	525	1,170	98,501	45,721
Southeast	79,753	79,800	6,246	7,591	12,769	10,512	6,148	5,875	12,972	13,583	4,180	5,224	19,080	15,276
South	27,368	27,556	3,157	2,602	8,669	10,590	1,745	1,790	15,684	15,394	1,516	1,753	18,053	15,719
Central-West	13,313	13,777	1,044	1,574	12,752	8,753	462	709	28,816	19,432	522	702	25,504	19,625

Source: Brazilian Ministry of Education/Anísio Teixeira National Institute for Education Research and Studies/Board of Education Statistics and Brazilian Institute of Geography and Statistics

From 1991 to 2008 there was 458% growth in undergraduate programs for health professionals. Biological sciences (649%), nutrition (658%), and physical therapy (892%) had the highest growth rates while medicine and dentistry (121% and 137% respectively) had the lowest ones.

According ENADE data, in 2004, most students in all health programs were females, except in physical education and medicine graduates. However, in 2007, the majority of students admitted to (56.3%) and graduating (54.7%) from medical programs were also females. Female students accounted more than 90% of all in speech and language therapy, social work, occupational therapy, nutrition (Figure 1). In almost all programs there was no statistically significant difference of gender between freshmen and graduating students, indicating a stable increase in female involvement in the area.

With regard to family income reported in the ENADE questionnaire by students of nursing, medicine and dentistry in 2004 and 2007, the highest proportion of students with family income of up to three minimum wages was seen in nursing (Figure 2) and the lowest one was found among students admitted to medicine programs. Among those graduating in 2004, the lowest proportion was seen in dentistry. However, in 2007, there was less participation of the poorest students in medical school. On the other hand, there was significant increase in the number of students in this income range in the nursing program and, to a lesser extent, among dental students.

## FINAL CONSIDERATIONS

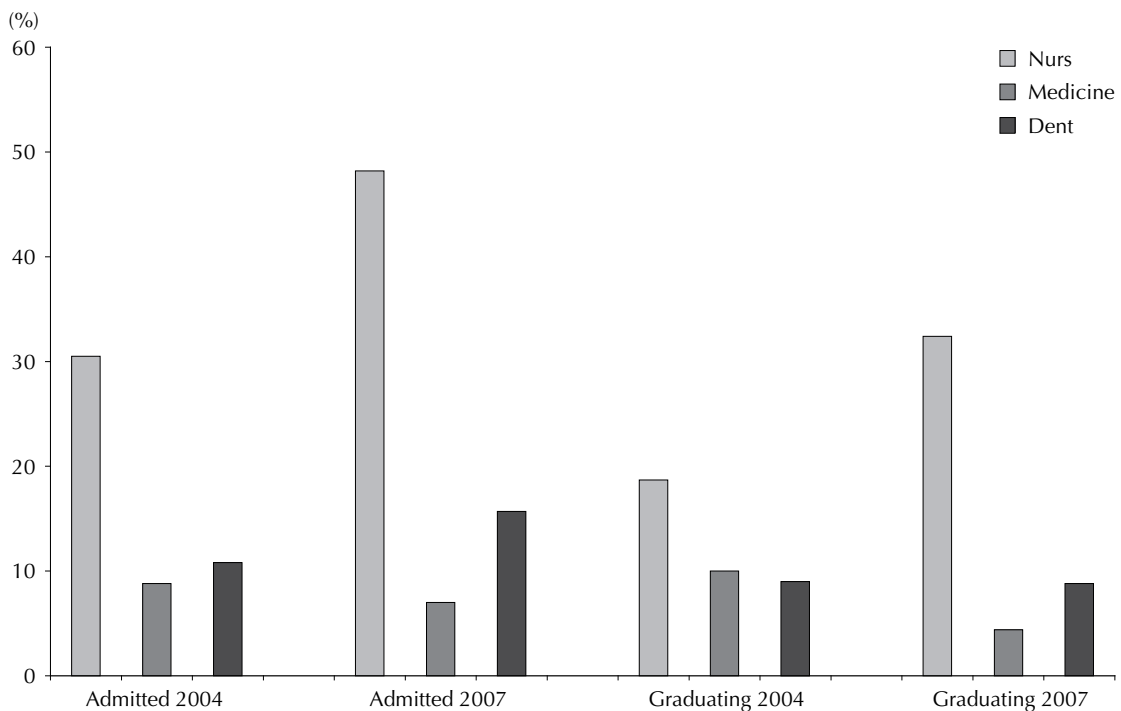
It is expected that this study can support the planning and implementation of training policies for human resources in health, considering that:

- the demand for health providers should be examined in different dimensions, taking into consideration its quantitative and qualitative aspects, including regional distribution of providers, for reducing inequality of access to services and health actions;
- there is a need to reduce regional imbalances by increasing training opportunities and creating jobs based on local demand and capacity. The demographic and epidemiological transition has changed population needs and demands for health care indicating an urgent need for integration between training and organization of health system;
- there should be integration between health services and higher education programs for the implementation of the National Curriculum Guidelines for Undergraduate Programs so that providers will be trained with an emphasis on comprehensive

**Table 3.** Distribution of programs, places and admissions in 1991, 2006 and 2008 and rate of places filled. Brazil, 2008.

Programs	N° of Programs			Places			Admissions			Places filled, 2008
	1991	2006	2008	1991	2006	2008	1991	2006	2008	
Total	867	4.135	4.841	78.422	521.584	638.732	70.081	316.164	320.962	50,2%
Biomedicine	0	100	152	.	12.473	21.873	.	6.521	9.748	44,6%
Biological sciences	92	649	689	7.226	54.606	54.333	6.000	33.831	29.690	54,6%
Physical education	117	617	783	13.409	90.181	108.455	11.275	56.030	52.923	48,8%
Nursing	106	564	687	7.460	95.080	116.305	6.476	62.024	65.623	56,4%
Pharmacy	49	301	353	4.153	39.087	51.341	4.080	25.079	25.675	50,1%
Physical therapy	48	420	476	3.250	63.975	74.935	3.121	29.995	27.225	36,3%
Speech and language therapy	29	102	101	2.328	7.423	8.490	2.118	2.756	2.181	25,7%
Medicine	80	160	177	7.786	15.278	17.504	7.523	15.424	17.298	98,9%
Veterinary medicine	33	138	155	2.796	13.984	17.366	2.742	10.253	10.270	59,1%
Nutrition	41	270	311	2.653	31.005	41.144	2.305	16.526	17.289	42,1%
Dentistry	83	185	197	7.315	16.841	19.257	7.087	11.419	13.317	69,2%
Psychology	102	352	418	12.475	55.436	70.242	11.295	28.618	31.317	44,6%
Social work	70	228	288	6.786	23.124	33.703	5.413	16.415	17.423	51,7%
Occupational therapy	17	49	54	785	3.091	3.784	646	1.273	983	26,0%

Source: Brazilian Ministry of Education/Anísio Teixeira National Institute for Education Research and Studies



Source: Brazilian Ministry of Education/ Anísio Teixeira National Institute for Education Research and Studies/ Secretariat of Health Workforce and Education/ National Examination of Student Performance 2004 and 2007

**Figure 2.** Family income up to 3 minimum wages among admitted and graduating nursing, medicine and dentistry students. Brazil, 2004 and 2007.

care of individuals, families, social groups and communities.

- the Ministries of Health and Education, through SGTES and the Secretariat of Higher Education are implementing the National Program for Reorientation of Health Professionals (PRÓ-SAÚDE).<sup>d</sup>

The present study results can be used to support further studies to explore the various aspects of training of health professionals, such as opening of new programs, regionalization, examination of social policies in health and education and their effectiveness for social and

economic development, among others.

The development of human resources is strategic for improving the Brazilian National Health System; there should be a very close partnership between the Ministries of Education and Health from basic education to permanent education processes. The development and enhancement of health providers is crucial for improved quality of training and health care provided to the population, and can increase the involvement of managers, health providers and society in the formulation of public policies in health.

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