

Analysis of the distribution of the health workforce in Brazil

Análise da distribuição da força de trabalho em saúde no Brasil

Análisis de la distribución de la fuerza de trabajo en salud en Brasil

Received: 05/26/2022 | Reviewed: 06/12/2022 | Accept: 06/12/2022 | Published: 06/23/2022

Patrícia Ferrás Araújo da Silva

ORCID: <https://orcid.org/0000-0002-7474-4972>

Ministério da Saúde, Brasil

E-mail: patricia.ferras@saude.gov.br

Helena Eri Shimizu

ORCID: <https://orcid.org/0000-0001-5612-5695>

Universidade de Brasília, Brasil

E-mail: helena.eri.shimizu@gmail.com

Mauro Niskier Sanchez

ORCID: <https://orcid.org/0000-0002-0472-1804>

Universidade de Brasília, Brasil

E-mail: mauro.sanchez4@gmail.com

Maíra Catharina Ramos

ORCID: <https://orcid.org/0000-0003-3829-975X>

Universidade de Brasília, Brasil

E-mail: mairacramos@gmail.com

Abstract

In Brazil, primary health care counts with multidisciplinary teams, comprising doctors, nurses, dentists, nutritionists, psychologists, pharmacists, physiotherapists, social workers and veterinarians, working in a complementary way. The objective of this study was to analyze the increase of these nine health professions from the censuses of the Brazilian Institute of Geography and Statistics (IBGE) for 2000 and 2010, identifying the panorama of the Work Force in health in all health regions in Brazil. There was an increase in the numbers of all professions in the period, especially induced by public policies. However, there are still problems, especially with doctors and dentists, due to uncovered areas such as remote and rural regions with difficult access. We underscore the importance of conducting health education, training and allocation of professionals, based on the needs of the health sector in Brazil for the provision of the labor force in areas with some degree of vulnerability.

Keywords: Public health policies; Human resources; Health workforce.

Resumo

No Brasil, a atenção primária à saúde conta com equipes multidisciplinares, compostas por médicos, enfermeiros, dentistas, nutricionistas, psicólogos, farmacêuticos, fisioterapeutas, assistentes sociais e veterinários, atuando de forma complementar. O objetivo deste estudo foi analisar o crescimento dessas nove profissões da saúde a partir dos censos do Instituto Brasileiro de Geografia e Estatística (IBGE) de 2000 e 2010, identificando o panorama da Força de Trabalho em saúde em todas as regiões de saúde do Brasil. Houve um aumento no número de todas as profissões no período, principalmente induzido pelas políticas públicas. No entanto, ainda há problemas, principalmente com médicos e dentistas, devido a áreas descobertas, como regiões remotas e rurais de difícil acesso. Ressaltamos a importância da realização de educação em saúde, capacitação e alocação de profissionais, com base nas necessidades do setor saúde no Brasil para a oferta de mão de obra em áreas com algum grau de vulnerabilidade.

Palavras-chave: Políticas públicas de saúde; Recursos humanos; Força de trabalho em saúde.

Resumen

En Brasil, la atención primaria de salud está compuesta por equipos multidisciplinares, integrados por médicos, enfermeros, odontólogos, nutricionistas, psicólogos, farmacéuticos, fisioterapeutas, trabajadores sociales y veterinarios, que actúan de forma complementaria. El objetivo del estudio fue analizar el crecimiento de estas nueve profesiones de la salud a partir de los censos de 2000 y 2010 del Instituto Brasileño de Geografía y Estadística (IBGE), identificando el panorama de la Fuerza de Trabajo en Salud en todas las regiones. Se observó un aumento en el número de todas las profesiones en el período, inducido principalmente por las políticas públicas. Sin embargo, existen problemas, especialmente con los médicos y dentistas, debido a las áreas no cubiertas, como las regiones remotas y rurales, a las que es difícil acceso. Resaltamos la importancia de realizar educación en salud, capacitación y asignación de profesionales, con base en las necesidades del sector salud en Brasil para la oferta de mano de obra en áreas con algún grado de vulnerabilidad.

Palabras clave: Políticas públicas de salud; Recursos humanos; Fuerza de trabajo en salud.

1. Introduction

The effort to obtain a system of high-quality healthcare is directly related with the health workforce (HWF) (Dal Poz et al., 2015). However, it is estimated that there is a shortage of more than 12 million health workers worldwide (Portela et al., 2017). In developed and developing countries, the inequality of distribution of health workers is greater in rural areas, in the periphery of big cities and in places of economic, social and geographical vulnerability (Silva et al., 2017).

Among institutions and organizations that are dedicated to research in this field, international agencies have been studying the issue of health workforce (HWF), pointing to international cooperation as a powerful strategy for dealing with the problem, by using technical cooperation among countries (Portela et al., 2017).

In Brazil, the distribution of HWF is a challenge due to its continental dimensions, with local realities being extremely diverse, requiring a careful analysis of each territory. Remote areas of difficult access are of special concern, as they present additional difficulties for the provision of proper HWF.

The Brazilian public health system underwent profound changes with the Constitution of 1988 and the institution of the Unified Health System (SUS), as can be seen in table 1. All these events represented an advance in the way health care is perceived and organized within the system and the network of services (Brazil, 1998; Garcia, 2010). In Brazil, regionalization has been a bet for optimization of resources for coping with inequalities, although the health regions require careful analysis due to their heterogeneity, with the study of its variables that go beyond the health sector (Ribeiro et al., 2017). The international experience on decentralization is a reality which has several layouts, with variations in each particular system (Ribeiro et al., 2017).

Table 1: Changes in the Brazilian Public Health System.

Brazilian Public Health System before 1988	Brazilian Public Health System after the 1988 Constitution
Centralized at the federal level	Decentralization and regionalization, states and municipalities became protagonists in the management of subnational levels
Funded and organized by Social Security, caring only for taxpayers (people with formal jobs)	Independent of tax contribution, guaranteed through social and economic policies aimed at reducing the risk of disease - universal and equal access to services for all
Care to non-taxpayers was provided by charity and philanthropy	Health has come to be recognized as the right of all citizens and a duty of the State
The concept of health was centered on the absence of disease	Expanded concept of health, which considers its multiple dimensions and determinants
Hospital-centered model	Primary care takes on the responsibility of being the entry point of the system, from where all the network of services stem from
Medical-care logic, centered on the physician	Composition of multidisciplinary teams to make the system operational
Health care was the main principle	Perspective of integrality, comprising actions directed to the protection, promotion and recovery of health

Source: Authors.

For the implementation of SUS, in any of its dimensions or level of attention, HWF is a paramount factor. The imbalances in the composition of health teams and their distribution complicate the current problems of health provision, which reinforces the strategic importance of this field. The needs for human resources for health systems vary from place to place and also by time period, and are directly affected by various factors such as new models of care, introduction of new technologies and even changing of the epidemiological profile (Dal Poz, 2013).

The distribution of the HWF in SUS has been presented as a serious problem, a reality which has been regulated by market rules, guided by individual, competitive and corporate interests, and often has resulted in precariousness, devaluation,

and invisibility of health workers. In addition, the shortage of health workforce (HWF) is still characterized by shortage of professionals, an inappropriate mix of skills and an unequal distribution of professionals (Dal Poz et al., 2015).

Although the planning of HWF allocation has been a constant theme in the years 2000, gathering agencies and international events, with the launch of important political and regulatory frameworks (Portela et al., 2017) (among which we can highlight the creation of the Secretariat for the management of Work and Health Education of the Ministry of Health in 2003 and the Basic Operational Norm of Human Resources for the SUS (NOB/RH-SUS), we can notice the coexistence of newly developed strategies such as new forms of hiring, types of bond and mechanisms for remuneration, and old situations. The latter were still leading to deficiency of qualified personnel, unequal distribution of the labor force in the country and imbalance between supply and demand of public services, identified since the years 1970 (Carvalho & Sousa, 2013).

The Brazilian health system presupposes the composition of multidisciplinary teams for operationalization of SUS, especially for the strengthening of primary care. In 1998, ten years after the implementation of the SUS, Brazil has recognized fourteen health professions as higher-level degrees, which are: Social Workers, Biologists, Biomedical, Physical Education Professionals, Nurses, Pharmacists, Physiotherapists, Speech Therapists, Medical Doctors, Veterinarians, Nutritionists, Dentists, Psychologists and Occupational Therapists (National Health Council, 1998).

The health policies in the years 2000 reinforced the importance of these fourteen health professions, which generally were included in the composition of multidisciplinary teams as stated in the regulatory framework.

In the context of primary care, the Family Health Strategy (FHS) had a great role in expanding health coverage (Portela et al., 2017), with a multidisciplinary design and attention given to the territory covered by each team. This approach shifted the focus from the financial incentive from the federal government for the deployment of these teams to a local needs assessment perspective. Doctor, nurse, and dentist surgeon make up the minimum FHS team, while Social Worker, Professional of Physical Education, Pharmacist, Physiotherapist, Speech Therapist, Nutritionist, Psychologist, Occupational Therapist and Veterinarian can compose the Family Health Support Centers (NASF) (Brazil, 2012). Except for biologists, all other health professions were considered within the scope of the Primary Care policy.

However, there were still barriers, especially in the provision of medical professionals in primary care, since there was much more financial appeal from the market for specialists, while primary care was relegated to second place, especially in remote areas which were distant from large centers.

The scenario observed in 2000 and 2010 gives us a panorama of the changing distribution by health regions, showing the potential of these professionals to work in the SUS, in line with the concept of regionalization, which may lead to resource optimization. It is expected that this process will have expanded access for the population, reducing regional inequalities.

Therefore, the objective of this study was to analyze the change in the number of professionals of nine health categories in Brazil in the study period, revealing how policies were translated into actual provision of services to the population.

2. Methodology

This is an observational, descriptive study (Nundy et al., 2022), looking at the number of professionals of nine categories of health throughout Brazil, namely: medicine, nursing, dentistry, pharmacy, physical therapy, nutrition, psychology, veterinary medicine, and social services. Data was obtained by place of work with information from the Brazilian Institute of Geography and Statistics (IBGE), in the Censuses of 2000 and 2010. We chose to analyze these nine professions because these were the ones with information from both census years, allowing for the comparison we aimed for.

The IBGE is the main provider of data and information for the country and is responsible for the population censuses, which happen every 10 years. The last census took place in 2010, providing an important source of data regarding the

population and its characteristics (Brazil, 2016). Although there is a time gap since the last census, the analysis from its data is still relevant. We do acknowledge that some new trends may have emerged since then, and this will be addressed in the discussion.

From the municipal data generated by the census, the statistical software R® was used to aggregate information according to health region, totaling 437 regions, as defined by the Regional Intermanagerial Commission (CIR in Portuguese) in 06/10/2014 (Brazil, 2015). CIR is responsible for establishing general guidelines about health regions, integration of geographic boundaries, reference and counter reference services and other aspects linked to the integration of health services and actions between the federal entities. Health regions were created to facilitate organization of the territory in terms of development and management of health.

To obtain the increase of existing professionals in the regions, we calculated the ratio between the difference in health professionals considering the censuses and the number of professionals in 2000. Thus, we used the formula:

$$\text{Increment} = \left(\frac{\text{Professionals 2010} - \text{Professionals 2000}}{\text{Professionals 2000}} \right) \times 100$$

The calculation was performed by professional category and total increment. For the mean increment of the regions, we calculated the increment of each Brazilian region, and subsequently calculated the arithmetic mean for each profession. For the calculation of the increment per 1,000 inhabitants, we used the increment by profession divided by the population measured in the 2010 census.

Three broad categories were considered for analysis: (i) negative change - when the health region presented in 2010 less professional than in 2000, was classified as an increment of -99 to -10% or, in a worst case scenario, -100%, where there has been a loss of all professionals in the area; (ii) no increment - when the number of professionals is the same in both years, being considered the range between -5 to 5%; (iii) positive change - when the number of professionals has increased in the year 2010 compared to the year 2000.

Due to the asymmetry of the distribution of increments per region when looking at all the data, we chose to report median increase as the main results. Both mean and median increases will be shown, though. This heterogeneity will also affect our interpretation of the findings.

It is noteworthy that the data obtained from the census portrays the amount of professionals living in each city, not only those who work in health. In this way, this figure represents the total number of potential professionals present in that territory.

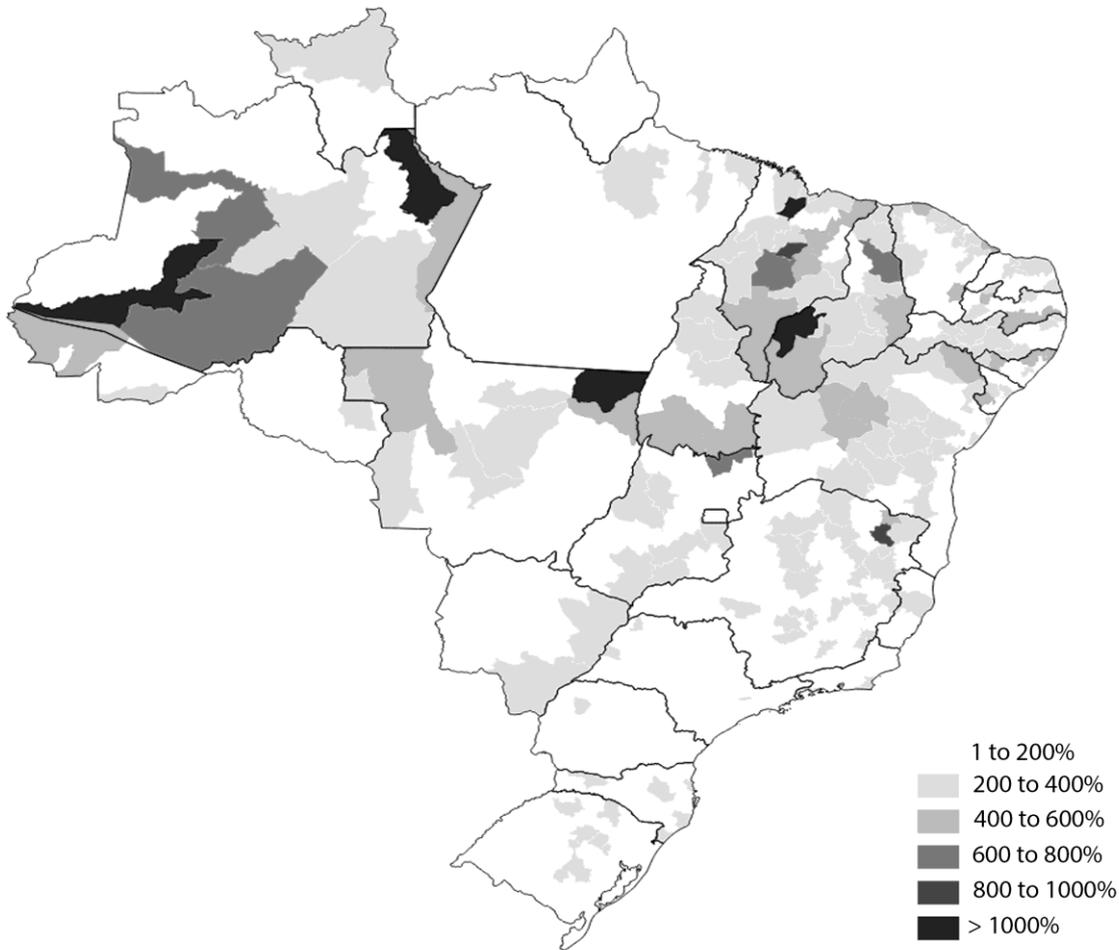
According to Resolution no. 510/2016 of the Brazilian Ethics Committee, there is a waiver of ethics committee approval for this work because it used public domain data that does not identify research participants.

3. Results and Discussion

In absolute numbers, the nurses were the category with greater increase between the years of 2000 and 2010, and the same finding applies to the mean increment of all regions and the increment per 1,000 inhabitants.

The map in Figure 1 illustrates the total increase of the nine professions (medicine, nursing, dentistry, pharmacy, physical therapy, nutrition, psychology, veterinary medicine and social work), demonstrating that it was positive throughout the country, with a median increase of 168% for all professions evaluated (Figure 1).

Figure 1: Total increase of the nine professions (medicine, nursing, dentistry, pharmacy, physical therapy, nutrition, psychology, veterinary medicine and social work).

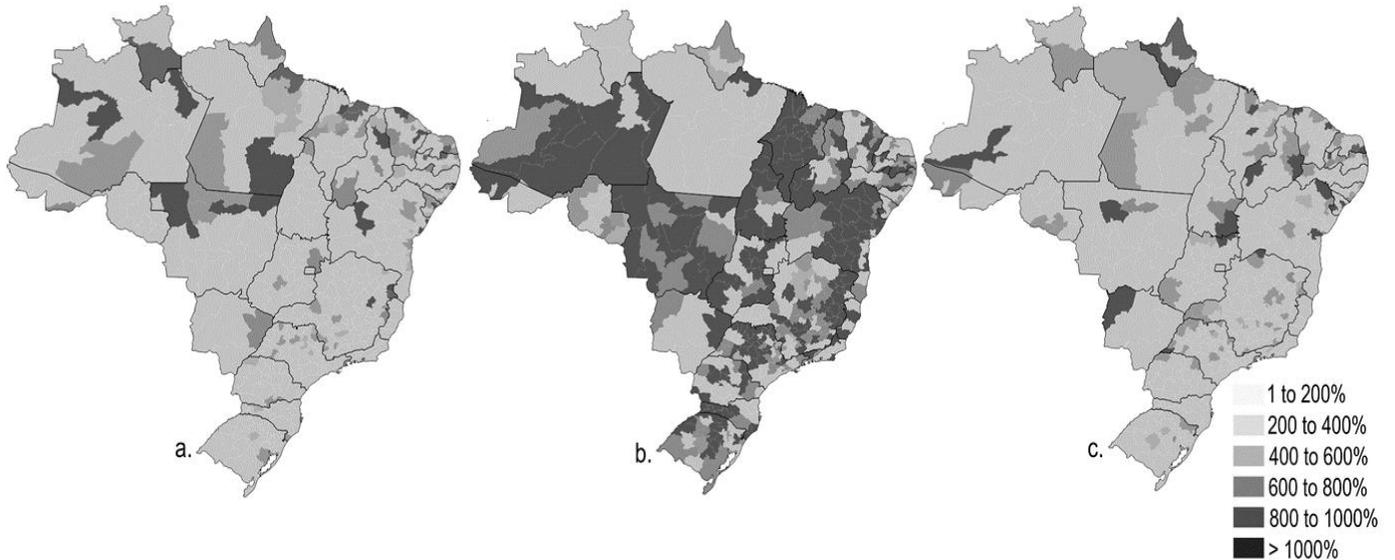


Source: Authors.

We can observe that some health regions have increased by more than 1000%. It should be emphasized that these cases were more frequent in the North and Northeast of Brazil, regions that suffer the most with the lack of professionals and with the issue of maintaining staff there once deployed – there is a high turnover rate in these areas.

When analyzed by professional category, inequalities in the distribution of professionals in the Brazilian territory can be noted. The increment of professions that compose the Family Health Strategy (FHS) teams - medical, nursing and dentistry – is presented in Figure 2. Despite the overall positive increment, particularly nurses, there are regions that have lost or who had not increased these staff in the study period. (Figure 2).

Figure 2: Increase on health workforce.



a. Increase in physicians in Brazil, 2000 and 2010; b. Increase of nurses in Brazil, 2000 and 2010; c. Increase of dentists in Brazil, 2000 and 2010

Source: Authors.

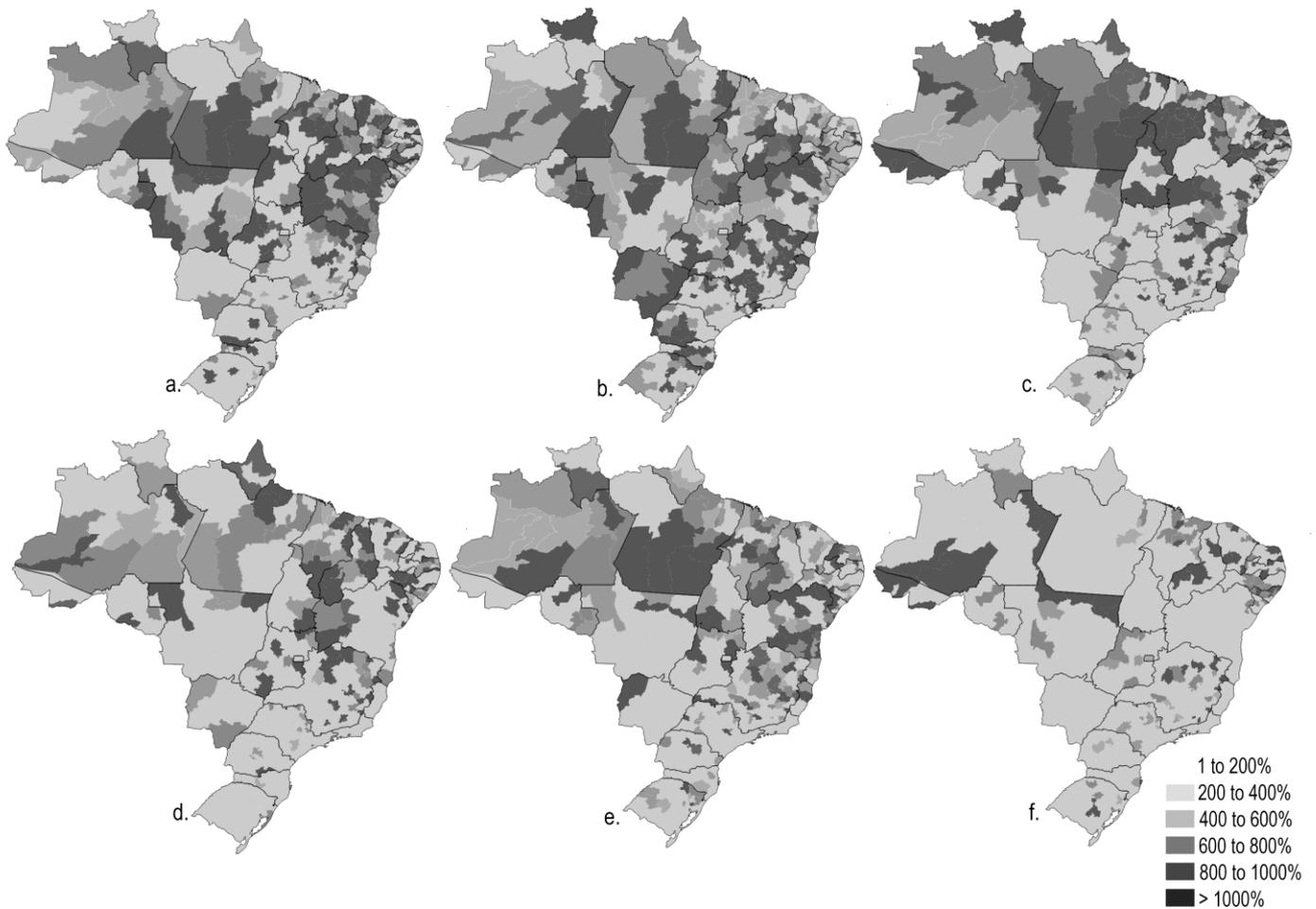
Looking at the medical category, the regions that have lost professionals are concentrated in the center north part of the country, with three health regions in the North and Northeast losing 100% of physicians in the period. The median increment of doctors was 67%, though.

The nurses, on the other hand, obtained a large increase in good part of Brazil. Few were the health regions that showed negative change. The category presented a median increment of 734%.

Similar to the scenario of doctors, dentists also showed negative growth in the center north of the country, with few health regions of southern Brazil with fewer dentists in 2010 than in 2000. The median increase was 71%.

The increment of other professions - psychologists, nutritionists, physical therapists, pharmacists, veterinarians and social assistants - is shown in Figure 3. With the exception of the category of social workers, who showed uniformity in the results, the professions have heterogeneous results. (Figure 3).

Figure 3: Increase on health workforce.



a. Increase of psychologists in Brazil, 2000 to 2010; b. Increase of nutritionists in Brazil, 2000 to 2010; c. Increase of physiotherapists in Brazil, 2000 to 2010; d. Increase of pharmacists in Brazil, 2000 to 2010; e. Increase of veterinarians in Brazil, 2000 to 2010; f. Increase of social workers in Brazil, 2000 to 2010.

Source: Authors.

The psychologists showed significant increase over these ten years. The regions of greater proportional increase was concentrated mainly in the northern part of the country (increase of 900%). However, it is important to note that in this same region we found the greater number of regions with negative change, i.e. who lost psychologists if compared with 2000. The median increment of class was 238%.

The center north of the country also showed significant loss of nutritionists. However, we observed higher capillarity in health regions with an increment greater than 900%. Nutritionists had a median increase of 181%.

Regarding physiotherapists, the greatest emphasis goes to the negative growth in the northern region of the country. The states of Amazonas and Pará presented the greatest losses in proportion when compared to 2000 for the category. The median increase was 265%.

Although some health regions have increased more than 900%, the pharmacy professionals presented negative increment in higher concentration in the North and Northeast of Brazil. The South and Southeast regions presented a homogeneous increase, already expected by the industrial health complex in those locations. Pharmacists showed a median increase of 167%.

Veterinarians also presented a negative growth in many regions of Brazil. North and Northeast, once more,

concentrate more health regions with changing -100% or -99 to -1% (negative growth). The Midwest also appears with some regions which lost these professionals in the study period. The median increase was 129%.

The only professional class that differs from the others are the social workers. In general, there was a homogenous increase throughout Brazil, with only a few distinct regions showing losses. The median increment of social workers was 148%.

There was an overall increase in all professions in the period. We can list the increase by category from largest to smallest increment: nurse, physical therapist, psychologist, nutritionist, pharmacist, social worker, veterinarian, dentists and medical doctors (Table2).

Table 2: Increase of nine health professions: absolute and percent increase, increase per 1,000 in habitants and per capita, mean and median increase per profession across all health regions. Brazil 2000 – 2010.

	Number of professionals in 2000	Number of professionals in 2010	Absolute increase	% increase	Increase per 1,000 inhabitants	Per capita increase	Mean increase among all regions	Median increase among all regions
Doctor	198,170	318,933	120,763	60.94%	0.633	0.063%	246%	67%
Dentist	153,424	224,079	70,655	46.05%	0.370	0.037%	242%	71%
Nurse	54,126	283,839	229,713	424.40%	1.204	0.120%	2648%	734%
Veterinarian	21,073	48,137	27,064	128.43%	0.142	0.014%	463%	129%
Pharmacist	45,582	107,803	62,221	136.50%	0.326	0.033%	560%	167%
Physiotherapist	51,420	126,188	74,768	145.41%	0.392	0.039%	968%	265%
Nutritionist	26,871	55,071	28,200	104.95%	0.148	0.015%	924%	181%
Psychologist	62,195	138,818	76,623	123.20%	0.402	0.040%	758%	238%
Social Worker	83,049	147,155	64,106	77.19%	0.336	0.034%	653%	148%
Total	695,341	1,450,027	754,686	108.53%	3.956	0.396%	215%	168%

Source: Authors.

The increase of Brazilian professionals is related to multiple factors. During the years 2000 and 2010 there was a growth from 1,343 teaching institutions in the year 2000 to 4,870 in 2010, with a significant expansion of courses in the north and northeast regions. This happened despite the greater concentration of vacancies for training and employment in the southeast region. As a comparison, in 2010 the United States formed 205,335 health professionals, a significant growth of 281% in relation to the year 2000 (53,904 professionals) (Pierantoni et al., 2012).

Brazil has adopted health policies that targeted a series of health professions that, before they were relegated to a less important role, took a leading part in the operationalization of the policy, with provision and deployment established in law, as was the case of the Family Health Strategy, which added nurses and dentists to health teams. We can also cite the National Oral Health Policy, which reorganized the primary attention in oral health, as well as the creation of the Single System of Social Assistance (SUAS). The latter, although not only addressing the health area, had direct implications for the scenario we are evaluating, with the hiring of social assistants and psychologists to provide care for the population (Silva & Almeida, 2018).

Recent studies corroborate the results obtained through the census using data from the National Register of Health Establishments in 2014 and also demonstrate the increase in all regions of the new professional categories that can compose the NASF teams, proving the impact of policies on conformation of HWF, especially in the expansion of Primary Care, with

the diversification of teams, historically focused on doctors and nurses (Carvalho et al., 2018 & Carvalho et al., 2016).

In addition, Brazil has invested in interventions that targeted the migration of health professionals. One of the most important initiatives was the Program of Valuation of Basic Care Professionals (PROVAB) which provided educational incentives to participants (Araújo et al., 2017). Although a large part of participants are doctors, PROVAB also encouraged other health professionals to obtain the title of specialist, granting subsidies for post-graduate programs (Araújo et al., 2017).

The expansion of supply and access to higher education, the expansion of distance education and new possibilities in the labor market have contributed to a significant increase in the availability of health professionals. However, the benefits that could come from these events were not observed homogeneously throughout the country. As we observed, areas of vulnerability suffered with the loss of professionals between the years 2000 and 2010, especially in the north and Northeast regions of Brazil.

Such a framework of professional scarcity is not recent in the Brazilian scenario. Since 1970 the country suffers distortions in the geographical distribution of health professionals. For the medical category, one of the most criticized, Brazil presented 80% of doctors in the Southeast and South regions, 17% in the Northeast region and only 1% of doctors were in the Northern region during the years 1970 (Oliveira et al., 2015). In a study conducted in 2018, more than 40 years later, it is still possible to see the discrepancy in medical allocation: South and Southeast accounted for 69.22% of registered and accredited doctors, while the Northeast region had 17.85% and the North 4.62% (Scheffer et al., 2018).

The inequality in the distribution of health professionals is not only a Brazilian problem. The literature points to several studies in which countries had some degree of difficulty in the allocation of HWF in remote and vulnerable areas (Machado et al., 2022; Rawal et al., 2018). In a study conducted in India, a country also with a large territorial extension, the government of Chhattisgarh has launched the Chhattisgarh Rural Medical Corps (CRMC) program, to deal with the acute shortage of professionals in remote and difficult to access areas. The program allowed for provisions as financial incentives, residential accommodation, life insurance and extra incentives during admission at postgraduate level (GP). The main goal was to provide doctors, nurses, nursing assistants and rural workers to deprived areas (Lyse et al., 2015).

In a study conducted in Bangladesh, strategies for retention of health professionals were evaluated, by means of policies such as reinforcement of training and reservation of quotas for candidates residing in the district of location of the educational unit. In addition, as well as the Brazilian case, the government has issued various policies and programs that encouraged the uptake of jobs in rural areas (Rawal et al., 2018). This study also showed that Bangladesh requires that every physician who has been newly recruited by the military service is obliged to serve for at least two years in rural and vulnerable areas. This service is a pre-requisite for post-graduation in medicine. In addition, the government offers additional funds for doctors and nurses who choose to work in rural areas (Rawal et al., 2018).

In Kenya, a study has evaluated the factors that influence the motivation of primary care professionals to remain in areas of vulnerability (Olango et al., 2014). It was identified that the inadequate access to electricity, equipment, transport, housing and physical state of the health care unit are the factors that influence negatively on the retention of professionals in rural health units, while the health benefits and salary were classified as important positive factors.

In a similar study conducted in Brazil, six factors that influence the permanence in a health unit were identified: remuneration, work rapport, working conditions, occupational factors, local factors and personal factors (Stralen et al., 2017). There was emphasis on the remuneration factor for permanence in a locality, in addition to not having delays in receiving salary, housing subsidy, food and transportation incentives. The category of work condition was identified as a factor that can negatively affect professional retention, being affected by the infrastructure, availability of equipment and materials (Cayetano et al., 2022). Access to exams, availability of medicines, and possibility of reference for experts and flexibility in working hours were also cited as important factors. Similarly, the category of local characteristics may also have a negative influence

on the decision to stay at the place of work. Economic development of the city and its location can also interfere in this choice. Conditions of access, distance and infrastructure of the municipality, as well as leisure opportunities, quality education for the children and the possibility of employment for the spouse are factors that weigh on the choice of the place of work (Stralen et al., 2017).

These findings corroborate with a study of systematic reviews which indicates that only financial incentives do not improve professional retention in remote areas, and it is necessary to consider personal, professional and social factors (Kroezen et al., 2015). Among the identified factors, we highlight opportunities of employment and education for the family, closeness of family and friends, opportunities for professional advancement, networks of professional support, professional autonomy, the maintenance of clinical skills, the recognition of peers, the availability of resources, hospital infrastructure, feeling connected with the community, working in a family environment and having access to social networks (Mbemba et al., 2016).

The Brazilian government has sought other alternatives to allocate the HWF in areas of social vulnerability, associating training components to the allocation policies. The most recent, started in 2013, was the More Doctors Program, highlighting the greater role of the Ministry of Health in primary care, performing direct recruitment, distribution, remuneration and training of doctors, besides promoting the reorientation of medical training in the logic of the interiorization of courses for a more equitable distribution among the regions of Brazil (Russo, 2021).

This program presented relevant results in remote areas and difficult access, involving foreign doctors, in particular by a technical cooperation with Cuba, in primary health care (Russo, 2021). In 2003 Venezuela, also in cooperation with Cuba, has strengthened its primary care system, expanding the coverage and the development of teams formed by doctors, nurses, dentists and other professionals (Brazil, 2016), similar to the model of the FHS.

It should be noted that the health policies have played an important role in encouraging the consolidation of multidisciplinary teams to institutionalize strategies. These policies have provided financial support to their implementation, allowing for a proper composition of teams and infrastructure, as was the example of mental health (Brazil, 2002), emergency care (Brazil, 2003), oral health (Brazil, 2004), basic attention (Brazil, 2006), Family Support Centers (Brazil, 2008) and organization of the Health Care Network (Brazil, 2010).

However, the efforts were not sufficient to compensate for the inequality in distribution among territories, which requires measures for the proper allocation and retention of professionals. In addition to the medical assistance, the integrated work among health categories and among different sectors, as well as a novel model for management and care can bring the possibility for an amplified reach of each clinic and for effective health promotion (Russo, 2021).

As for the limitations of the study, we acknowledge that the study design does not allow us to address the issue of high turnover of professionals in the field. Another issue is that the data refers to the total number of professionals in their localities, only allowing us to infer about the potential for acting in the health system in that territory. Lastly, it is possible that the changes have occurred since 2010, as this was the date the last census took place. These changes should be analyzed when the new census data become available. This will certainly complement our findings, as they will be able to confirm if the country continued with the same model regarding distribution if the HWF, or if new patterns emerged.

4. Conclusion

During the study period there was an increase in all professions, but problems remain, especially with doctors and dentists, despite an absolute increase in their numbers, due to their heterogeneous distribution, resulting in deficits in remote, rural and hard to reach territories.

Despite all the efforts that were outlined, many regions lost health professionals in the study period, which indicates

the need of developing strategies not only for the retention of professionals, but also to strengthen primary care – which needs multidisciplinary teams to be effective.

It is important to stress the importance of planning for service provision and training in health in Brazil, which today is still heavily regulated by the market, producing devastating effects, such as the lack of a balanced distribution of health professionals in the Brazilian territory.

The implementation and strengthening of a public, universal and good quality Unified Health System (SUS), is still a challenge in a country with continental dimensions like Brazil. Inequalities sometimes constitute barriers to both access and provision of services. In spite of the obvious need for organization at regional level, there are still many challenges to overcome health inequalities, in particular with regard to the providing and retaining health professionals in locations which are distant from large centers, in small-sized municipalities and in areas considered remote or difficult to access, which is the case of a large part of the Brazilian territory.

It is essential to improve the health workforce in the SUS to develop policies for training and retaining workers. In this sense, it is necessary to carry out other studies, with more current data, on the distribution of health professionals in Brazil - a new analysis may be carried out later with data from the 2022 Census. In addition, it is necessary to investigate further depth the factors that can be a barrier or a facilitator for the establishment of the workforce in the Brazilian public system, to provide specific evidence for the local contexts and for the formulation of public policies.

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