

Structuring of the Brazilian Public Health System and the Development of Telehealth Activities in Brazil

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Abstract

This article intends to describe the structuring process of telehealth activities in Brazil within the context of the evolution of health care policies. It will particularly focus on the implementation of the family health program, which is the principal area addressed by the national telehealth program currently in progress in the country. By creating the National Health System, the Constitution of 1988 set in motion a long process of restructuring the country's public health system. This process which began in 1994 used the family health program as the main strategy to guide the health care model. In turn, this generated a series of important challenges that would be necessary to overcome in order to consolidate such a program. Important milestones in the country's national health care policies are listed and correlated with the growth of the family health program. The development of telehealth activities in the public arena in Brazil is described, situating the beginning of this initiative as well as the challenges and characteristics inherent to it. This process culminated in the establishment of a bold national telehealth program focused on primary care in 2007. The implementation of the national telehealth program is treated as an important component in the restructuring of Brazil's public health network.

Key words: National Health System; Health Services; Telehealth; Telemedicine; Brazil.

Resumen

Estructuración del Sistema Único de Salud y el desarrollo de las acciones de telesalud en Brasil

Este artículo se propone situar el proceso de estructuración de las acciones de telesalud en Brasil, en el contexto del desarrollo de las políticas de salud, concentrándose principalmente en la implantación del programa de salud de la familia, principal área de ejecución del programa nacional de telesalud actualmente en curso en Brasil. La constitución de 1988, con la creación del Sistema Único de Salud potencia el largo proceso de estructuración de la red pública, que a partir de 1994 elige el programa de salud de la familia para reorientar el modelo asistencial, lo que generó un conjunto de desafíos importantes para su consolidación. Se detallan los importantes marcos de la política nacional de salud en el país, correlacionándolos al desarrollo del programa de salud de la familia. Se describe el desarrollo de las acciones de telesalud en Brasil en el área pública, situando el surgimiento, los desafíos y las características de estas iniciativas que culminarán con el lanzamiento del osado programa nacional de telesalud volcado hacia la atención primaria en 2007. Se aborda la implantación del programa nacional de telesalud como un componente importante de la estructuración de la red pública en Brasil.

Palabras clave: Sistema Único de Salud; Servicios de Salud; Telesalud; Telemedicina; Brasil.

Resumo

Estruturação do Sistema Único de Saúde e o desenvolvimento das ações de telessaúde no Brasil

Este artigo se propõe a situar o processo de estruturação das ações de telessaúde no Brasil, no contexto do desenvolvimento das políticas de saúde, focando particularmente a implantação do programa saúde da família, principal área de atuação do programa nacional de telessaúde atualmente em curso no país. A constituição de 1988 com a criação do Sistema Único de Saúde, potencializa o longo processo de estruturação da rede pública no país, que a partir de 1994, elege o programa saúde da família como principal estratégia para reorientação do modelo assistencial, gerando um conjunto de desafios importantes para sua consolidação. São detalhados os importantes marcos da política nacional de saúde no país, correlacionando-os com o desenvolvimento do programa saúde da família. O desenvolvimento das ações de telessaúde no Brasil na área pública são descritos, situando o surgimento, desafios e características destas iniciativas, que vão culminar com o lançamento do ousado programa nacional de telessaúde voltado para a atenção primária, em 2007. A implantação do programa nacional de telessaúde é abordada como um componente importante na estruturação da rede pública no Brasil.

Palavras-chave: Sistema Único de Saúde; Serviços de Saúde; Telemedicina; Telessaúde; Brasil.



THE DEVELOPMENT OF THE FAMILY HEALTH PROGRAM IN BRAZIL IN THE CONTEXT OF HEALTH CARE POLICY

Currently, the Brazilian Public Health System (SUS) in Brazil is composed of a network of sixty three thousand ambulatory units and approximately six thousand hospitals, with service providers that include a combination of government employees and personnel outsourced from third-parties. Annual production amounts to approximately twelve million hospitalizations, one billion outpatient procedures involving primary care, and hundred and fifty million medical consultations, in addition to tests and more complex procedures.¹ This universal public health system was structured in accordance with the Brazilian Constitution of 1988, which: 1) gave authority to the federal government to regulate and control health services and activities; 2) proposed the creation of the SUS, assuring decentralization along with complete services and community participation in health care; 3) created norms for the participation of private entities as complementary providers.

The Federal Constitution of 1988 stated that *health care was the right of all and an obligation of the State*. This premise is guaranteed through social and economic policies that aim at not only the reduction of risks from disease and other health threats but also equal, universal access to actions and services directed at the promotion, protection and restoration of health.² Health care must be considered a right of all citizens. It must also be considered in the context of the social inequalities that plague Brazilian society so that the discussion of such inequalities becomes an important component in the formulation of health care policies in the country.

The restructuring of the public health system in Brazil came about due to the existence of a broad-based health reform movement. This led to the recognition, by the Constitution of 1988, of health as the right of every citizen and the consequent establishment of the SUS. This system was structured on a single authority for health policy, resulting in a long process of institutional integration that began in the 1970s with the order for political-administrative decentralization. In the context of a democratic federation, this resulted in the strengthening of thousands of other health authorities – the governors of state and municipal health departments.²

This process, the result of a powerful popular and labor related movement, has been gradually honing the original

features of the SUS, at the same time that other variables have been affecting the configuration of the Brazilian health system. Machado³ identifies these influences:

The first variable in concern is the State's wider reform agenda. Since the 1980s, there has been a tendency to substitute the "Positive State" – characterized as a planner, direct producer of goods and services, and employer – with the "Regulatory State." It should be noted, interestingly enough, that these kinds of changes express themselves differently from country to country and in different political regions. The 1990s in Brazil was characterized by economic liberalization and democratization, with the prevalence of an agenda for state reform that sought to tear down the "Vargas era" model of state economic and social intervention. Hence, the new model for the state was based on the principle of reducing the size of public administration and the role of the state as a direct provider of services. The new philosophy for the operation of the state is market oriented. This, in turn, established a gap in relation to the citizens and transformed them into consumers due to the State's limited capacity for intervention in social policies.

These characteristics, regarding the concept of the State, were predominant during the 1990s, but they have changed significantly in recent years. Nonetheless, these macro-political issues have an impact on the structuring of the SUS, affecting and/or changing the structuring process. The introduction of the family health program began in 1994 in the midst of a process underway in Latin America. This process was two-fold. First, it dealt with the implementation of policies focusing on populations that were vulnerable from a socio-economic point of view. Mattos⁴, of the Social Medicine Institute of the State University of Rio de Janeiro, claims that the imposition of the neoliberal agenda, in terms of health care, was re-energized by new incentives from the World Bank. The document entitled "*Financing health services in developing countries: an agenda for reform*"⁵ of 1987, harshly criticized governments that viewed health not only as a right but also tried to assure free universal access to all services. The extreme fundamentalist neoliberal position was met with strong resistance. A new document "Investing in health,"⁶ in 1993, proposed restrictions on free public health services, favoring a focus on subsidized public health services only for the poorest classes of the population. Direct provision of health services by the public sector was questioned, although the need for the State's involvement in areas where

large subsidies would be required for the private sector to function efficiently was recognized. Explicitly admitting the imperfections of the operation of the free market in medical services, it proposed regulatory actions on the part of the government to overcome these shortcomings.

A second group of variables is related to the historical evolution of centralized decision making process and administration of the Brazilian Health System and its institutional legacy, which has influenced the federal model for structuring the SUS. A third variable involves its budgetary importance and public visibility, making it a *locus* of priorities for successive administrations and federal leaders.

In the midst of these influences, the SUS was already attempting to expand ambulatory coverage. This effort gained momentum with municipalization, which was in turn made possible by the operational norms issued by the Ministry of Health. In addition, it gave the public health system the role of administrator of the municipal departments of health. This process has strengthened the municipality's typical intervention action directed at primary care. Part of this momentum is due to the establishment of a percentage of total resources that municipal budgets were required to devote to health.

The normative regulation of the constitutional mandates⁷ brought about the municipalization of the administration of health services in 1990. The NOB/93,⁸ which is the Basic Operational Norm, issued by the Ministry of Health, defines the operational procedures and tools that are necessary to determine and improve conditions for management of the SUS, thus making the municipalization process possible. Its objective is to establish unified control of the SUS on three levels of government. In addition, it seeks to set up the simultaneous operation of differentiated situations for administration of the SUS in states and municipalities, within a new configuration that takes into consideration the relationship between the three levels of government. In practice, what NOB/93 did was allow the actual process of municipalization of health resources and services, linked to the SUS existing in the country, to function. It was, therefore, a significant step in the long process of political-administrative decentralization that had been in progress in health since the beginning of the 1980s. It made it possible for municipalities to manage their resources and budget their expenses autonomously. It should be noted that municipalities, throughout Brazil, receive all of the financial resources for the corresponding limits established for their ambulatory and hospital costs on a monthly basis.

To participate and remain in this system, each municipality, among other requirements, must have a functioning municipal board and a municipal health fund, must be able to document its share of the total resources contributed to health from its own municipal treasury, and must present a municipal health plan and management report issued by a bipartisan committee.

In 1994, while the municipalization process was taking shape, the Family Health Program was created. It had the following characteristics: promotion and protection of health; defined coverage areas, with registration of clientele; teams with minimum composition requirements; residencies for community agents at the service locations; community participation through health education programs; complete and permanent service; integration with the local health system; impact on the formation of human resources; differentiated remuneration.⁹ The program is formulated as a proposal for health services aimed at areas of risk, which are in turn defined by the Map of Hunger of the Institute of Applied Economic Research

The family health teams are made up of one medical doctor, one registered nurse, one nurse's aide and five to six community health agents. Each team is responsible for a thousand families. This is the equivalent of approximately 3,500 people who are monitored through registration, house calls, health education activities, and consultations and service at a Primary Care Unit, with referrals for specialized consultations in cases involving greater complexity. Thus, the family health program in Brazil was officially implemented in 1994.

In 1996, a new NOB¹⁰ was issued with an innovative formulation for passing on resources for primary care. This was previously done by a set of historical series. In addition to a per capita/yearly amount for primary care, the values passed along for medium and high complexity services were standardized. This was based on a previous logic, which instituted a certain type of planning and programming that had been agreed upon between management and operators. This was considered to be a mechanism for assuring services at the different levels of complexity in the system. A major new feature is the fact that this NOB allows for the aggregation of additional resources in order to promote and reorganize the model for health services; it does so by using the implementation of the Family Health Program (PSF) and the Community Health Agents Program (PACS) as a strategy. This standardization created the basis for financing the implementation of the family health program in Brazil.



Some authors point to a few peculiarities that explain the growth and implementation of the family health program. Vianna and Dal Poz¹¹ point out that there was a positive interaction between the implementation of the PSF and decentralization. In this case, the PSF facilitated the adoption of financing primary care actions *per capita*, which in practice stimulated the reorganization of primary care.

Gabois et al.¹² identify factors that came together for the implementation of the PSF: the successful experience of the actions of the Community Health Agents Program (PACS) in the Northeast; the programmatic gap in the health care question in the SUS, and the political attraction that a program of this size can represent even for a government that has neoliberal tendencies. The PSF, from the institutional point of view of the Ministry of Health, went from being an approach for a specific program to being considered the strategy organizing a new health care model that would represent a substitution of conventional practices.

It is important to observe that the policy of decentralization, underway in the country, in terms of incorporating elements of the health care model, sent a signal to municipalities. It sent the message that a new type of health care model was being created, guaranteeing that money would be passed along. The implementation of the previously conceived model, in a context in which the financing process for primary care in the country breaks with the logic of production of services and becomes responsible for the population, guarantees relative autonomy along with a strong incentive for policies dictated at the federal level.

Given this context, which involves transformations in the SUS, and where distinct interests and perspectives collided and competed, what actually happened with health policy during the 1990s in Brazil?

We can observe that the evolution of the SUS throughout the 1990s was centered on the structuring of mechanisms to allow for the political-administrative decentralization of the SUS. This was done to a significantly radical degree with regard to the single control of actions and the effective process of municipalization. The basic attempt underlying these changes was the elimination of processes, which historically speaking, presented problems resulting from payments for certain procedures. The history of financing of actions, during this period, reveals this process, which can be characterized by the standardization related to management conditions, the financing of actions and of the transference of resources. At the beginning of the 1990s, payment for the production of services and centralized execution of resources predominated, without the

automatic transfers to states and municipalities. From 1994 through 1997, we can observe how a great deal of autonomy was given to municipalities that were more advanced in their management. Hence, in these cases, there were automatic transfers from the federal government being released. These generally corresponded to established limits based on the municipality's past history with regard to expenses. During a third stage, between 1998 and 2002, two simultaneous movements were observed.¹³

The first was the implementation of the Primary Care Minimum Payment (PAB-fix) in an attempt to return to processes still linked to services that were provided. At the same time, there was an important increase in the compartmentalization of transfers due to the imposition of conditions and links to the application of the resources, which restricted the autonomy of states and municipalities in making policy decisions. Furthermore, this made it more difficult to manage the resources transferred.

Another result from this period was the creation of the Strategic Action and Compensation Fund (FEAC), which gave the Ministry of Health more flexibility in the allocation of resources by allowing for: payment for strategic actions outside of the limits established for states and municipalities; the redirecting of surpluses; coverage of expenses exceeding limits; and remuneration for interstate services provided to patients. This process allowed the Ministry of Health to prioritize its actions. The foundation for financing of the PSF resulted from this process. Federal financing of health care only changed with regard to the link among a states, a municipalities, and the State. From 2000 onwards, this became more fragile.

Also during this decade, a great step was taken with regard to the establishment of the health care model. The Ministry of Health now specifically defined the implementation of the family health program. This real process of implementation of the PSF clearly revealed the question of human resources as a central component. In addition, the process was guided by an attempt at trying to overcome the profound inequalities related to the distribution of access to health services in Brazil.

From this perspective, the PSF can be considered an intervention strategy with great potential to expand basic health care access to diverse regions of the country. In addition, it can impact the configuration of the labor market and the very educational process leading to the entrance of these professional in the sector.^{11,14,15} A national research carried out in 2001 by the *Market Indicators Research Laboratory* (NESCON/UFGM) reveals the principal characteris-

tics of this market¹⁵, detailing a significant increase in the PSF teams, with the presence of doctors in the majority of them. The question of the serious decrease of permanent jobs in health care as the main problem expressed by the professionals became relevant. This is given that, in 2001, there were already more than 155,000 community health agents in the PSF and more than 13,000 health teams had been established. The challenges related to conforming to the new model necessarily had to consider the educational process and commitment of professionals.

With regards to the question of unequal distribution of resources across the country, in terms of socio-economic criteria, it may be observed that, in 2004, the Northeast, Center-West, and Southern regions had the largest portions of population covered by the PSF, approximately 55%, 41% and 38% respectively, followed by the North and Southeast regions, with 34% and 30%. From 1998 through 2004, there was significant expansion in all regions, but with greater coverage in municipalities with a low Human Development Index (IDH). Beginning in 2000, this expansion occurred in smaller municipalities. Nevertheless, the question of prioritizing the implementation of the PSF in poorer municipalities was made possible.

Thus, according to Sousa¹⁶ “establishing the Family Health Strategy (ESF) has in fact created a new model for health care, which has in turn become a new innovative form of providing health services based on a new social ethics.” Soares¹⁷ adds that “it is necessary to look at the real process of municipalization that is occurring today in the SUS, particularly in light of the restrictive context of adjustment and the proposals for State reforms, which are aimed at privatization and the focus on public services for poor people.” Another question that is frequently debated is the nature of the focus of this proposal.

Various authors address this perspective, pointing out that the strategy of the ESF will be directed at regions and social groups suffering from social and sanitary exclusion. According to Paim¹⁸, it is “‘SUS for the poor,’ centered on a simplified medicine for simple people, through targeting.” In addition, Viana and Dal Poz¹⁹ affirm that “the program reveals the need for special actions and for special services that target the more needy populations.”

However, one can observe that the impact of this policy, which had a specific focus and characteristics of simplified medicine aimed at poor people, was significantly minimized by the actions taken in the construction of the SUS. Furthermore, it came from the influence of a powerful social movement. This very movement was embedded with a firm deter-

mination to fundamentally guarantee popular participation as an important condition for making change, particularly to the biased construction of the public sphere in Brazil. In addition, this movement had a rich tradition of formulating SUS principles that were based on the complete provision of health care services and a powerful movement toward municipalization. In fact, these were considered to be a pillar in the process of the decentralization of operations.

If on one hand, the confluence of action in favor of municipalization with the structuring of PSF allowed the SUS to be saved from neoliberal attacks, on the other hand, the formulation of the actions of structuring underway had different effects on the various groups that implemented health care reform in Brazil. This process resulted in distinct patterns in terms of the implementation of the PSF in the country and the recognition of primary actions in the development and strengthening of the effective restructuring of the health care model. Despite these distinct patterns, the SUS continued to be structured with a universal vocation and in 2002, there was a standardization of actions that focused on other levels of service in the system, particularly the structuring of the process for specialized services.

In 2002, the Ministry of Health began a complex process of creating norms related to the definition of the states’ role within the scope of the structuring of the SUS. If during the 1990s a great effort was concentrated on the process of municipalization and attempts to apply neoliberal models in health care, beginning in 2002, efforts were made in attempt to (1) define the attributions of the distinct regions, (2) move forward with the structuring of the processes for referrals and counter-referrals, and (3) move toward the creation of new fronts, which would contemplate complete care coverage and the construction of pacts between the various parties involved in the process of the consolidation of the SUS.

The Operational Norms for Health Care, NOAS-SUS 01/2002²⁰, in accordance with this perspective, sought to: 1) increase the responsibilities of the municipalities in primary care; 2) establish the process of regionalization as a hierarchical strategy in health services and as a search for greater equality; 3) create mechanisms to strengthen the management capacity of the National Health System, and 4) proceed with the updating of the training criteria for states and municipalities.²⁰

NOAS attempts to discuss the role of the State and its attributions for the construction of the SUS. It establishes forms for the operationalization of regional structures with the structuring of intermunicipal reference units. It also enables financing for average complexity that is no longer



for production but per capita – even though it is still for a limited set of procedures – according to guidelines already established in the process of municipalization in the sector. In practice, it standardizes the role of the State in the construction of the SUS, while also taking concrete steps toward the structuring of secondary specialized referral, completely coordinated with a structuring of the provision of care and municipal flows.

With regard to the macro-political picture, the country finds itself in a different environment than it was during the 1990s. Social policies, that are being formulated and implemented, are undergoing great changes. Various new programs are being organized and implemented, keeping in mind the powerful network of emergency care promotion and social inclusion (*Bolsa Família, Luz para Todos, literacy programs, microcredit, banking services*). These programs, under the protection of the State, are enriching and amplifying the scope of public policies for tens of millions of Brazilians on the fringes of the formal labor market. The numbers related to poverty indices have declined in the country, with millions of impoverished rising out of this category. Furthermore, the country is taking important steps in the direction of creating a true republic out of the Brazilian State with the construction of a more equal set of rights and responsibilities that are, in turn, able to overcome patronizing elements and State privatization.

In this context where social policies are emphasized, the implementation of the Family Health Program was propelled forward. From 2001 through 2008, the number of community health agents went from hundred fifty five thousand to 230,244 and the number of teams in the Family Health Program jumped from 13,661 to 29,300. The PSF was seen as redefining the model for health service, within the political and social agenda of the sector, as it represented one more option in the labor market for doctors and other health professionals. Even so, the challenges are enormous. Back in 1975, Donnangelo²¹ summed up the questions that needed to be addressed both with regard to the labor market and the educational training process in order to implement new health care models. The possibilities available within the current form of market organization, the standard traditional educational training that is based on a highly structured technical orientation of hospital-schools, and the formal and informal mechanisms that give value to specialists within this pattern of action, not only allow but stimulate the search for integration in the market through specialization. In this sense, specialization has become the method by which technological innovations are incorporat-

ed into medicine, creating segmented practices, with areas identified by specific characteristics such as educational background and labor market, in a type of “tribalization of the medical profession”.²² In this context, the family health program teams require significant changes in the process of educational training, effective processes for evaluation, and updating of professional practice in order to remain viable in the market. Along with this process of specialization, the incorporation of technology has become one of the foundations upon which the education and practice of medicine is based. As a result, this creates greater market value and social *status* for some areas of specialization when compared to others that are more generalized and less technologically advanced.

The persistent dominance of the biomedical, hospital-centered model with its disease orientation, the dichotomy in regard to prevention and cure, and its quite incipient approach with regard to health promotion, are some of the looming obstacles to the success of this strategy and to guaranteeing the population its *right to health*. The notion of a gift to the population and not a right has been one of the mechanisms for maintaining the dominant model. In the opinion of Teixeira²³ “the flexibility and perfection of family health can become a fundamental element for changing the answers to the problems and necessities of the population with regards to the health service offered by the SUS.” This is feasible with mechanisms for popular participation being progressively incorporated. The implementation of the PSF, which relies upon health agents from the community where the program is established, solidifies the possibility of having a health system that adapts itself to the reality the population is living. In addition, it has the important potential for adding other elements into the health system’s organization process. Despite this fact, the difficulties faced in implementing the Family Health Program are immense, particularly with regard to complex questions involving the process of educational training and the dynamics of the labor market in health care.

In the case of the labor market for doctors, according to Girardi²⁴, the two most important institutional factors that define the market are (1) the educational system, which trains and creates the supply of professionals and (2) the model for providing health services, which has a strong influence on the demand and the composition of this labor force. Both the structure and the volume of the supply are regulated by the potential of the educational system, which is, in turn, pressured by social, demographic, and political-ideological demands, as well as by the necessities of the

productive structure. The volume and the make up of the demand, for its part, reflect the established forms of organization of health care. Consequently enough, these result from the format that social policies assume during each historical era and also the technological changes in health care and its labor processes.²⁵

The process of the consolidation of the family health strategy stimulated actions directed at making qualitative and quantitative changes in the educational training of doctors and the geographic distribution of these professionals.¹⁴ In 2002, a partnership between the Ministry of Health, the Ministry of Education and the Brazilian Medical Education Association (ABEM), led to the creation of the Incentive Program for Curriculum Changes at Medical Schools (PROMED). Created by Interministerial Decree n° 610, the purpose of PROMED was to "...stimulate the promotion of transformations in the processes of educational training, the generation of knowledge and provision of services to the community, through curricular innovation..."²⁶

More recently, there have been growing concerns related to the educational training professionals receive. One of the principal actions taken by the Ministry of Health was the creation of the National Program for the Reorientation of Professional Education in Health (*Pró-Saúde*), which began in November 2005. From the courses of Nursing, Medicine and Dentistry, 90 programs were selected for establishing training within basic SUS units. The World Health Report and the World Federation of Medical Education mentioned *Pró-Saúde* as the most courageous example of linking education and health in the world today.^{27,28}

Feuerwerker²⁹ reminds us that the challenge to this tendency for changing the health care model, represented by PSF, is that it is under construction and involves complex questions, such as the articulation among the clinic, collective health, and multi-professional work. Nevertheless, he feels that it represents an opportunity not only for rethinking medical education but also for creating a demand in the market for a new profile for this professional.

Maciel Filho³⁰ adds: "The receptivity of society and the administrators of the SUS to this new model indicates that we are dealing with something that is here to stay. This proposal has a direct relationship to what medical schools declare to be their mission: the complete educational training of a qualified professional, dedicated to society's epidemiological and social necessities. However this task cannot be the exclusive duty of the State. It is a challenge for society as a whole. The role of the government should be to institute policies that promote change, while at the same time rein-

forcing the principle of partnerships with social agents that understand the urgency for their proper development."

Another important component involves the structuring of the labor market in light of the problem of a poor distribution of doctors and other professionals throughout the nation. Interventions related to this aspect date back historically to the beginning of the 1960s with the establishment of various governmental programs. The oldest of these was the Rondon project, which was instituted by the military dictatorship to promote a movement focusing on the countryside of the nation. The intention of this program was to defend the national territory. The Program of Interiorization of Health and Sanitation Actions (PIASS), in 1976, is a part of the history of the SUS, with its important role in the process of restructuring primary care.^{31,32}

Initially, the program focused on the expansion of the basic structure of public health in the Northeast region, but was progressively extended to the entire country. Later, the Program for Interiorization of the Brazilian Public Health System (PISUS)³⁵, in 1994 – and the Program for Interiorization of Health Care (PITS)³⁴, were implemented in 2002. These programs were designed to stimulate doctors and nurses to move to needy and distant municipalities through the use of financial incentives and professional educational training.

At the same time, various studies attempted to discover what factors would persuade professionals to relocate and remain in locations far from large population centers. Pinto³⁵ showed that 26.9% of all doctors active in the country migrate for family reasons, 25.7% in search of professional education, and 24.4% for better working conditions. These findings are corroborated by other authors. Page *et al.*³⁶ also dedicated research to studying factors that affect doctors' choices for where to work. As negative factors, professionals cited: the lack of other doctors with whom they could interact; the non-existence of supervisors; the lack of specialists to whom they could refer patients; the lack of equipment and resources for maintenance; the lack of laboratory support; the long distances to urban centers; difficulties with transportation; the scarcity of leisure options and even the lack of opportunities for continuing education. It should be noted that this last reason was emphasized as a very relevant factor in the decision of choosing where to work. As positive aspects that would mobilize professionals to work in these areas, the following factors were identified: less violence; less pollution; a desire for change; and altruistic feelings.

The process of implementing the PSF in the country mobilized resources that came from diverse areas. It is



through the process of incorporating information technology, focused on health care and the formation of human resources, that the country will undergo experiences in telehealth that seek to contribute to the consolidation of the PSF.³⁷ These proposals stem from perspectives for overcoming problems that have already been identified in the process of structuring the PSF in the country. In addition, these proposals will lead to the progressive accumulation of experiences, through the national telehealth program which began in 2007 by the Ministry of Health. Consequently, the goal is for them to be transformed into institutional policies that will have a great impact on the country.³⁸

THE DEVELOPMENT OF TELEHEALTH ACTIVITIES IN BRAZIL

The SUS began to test telehealth projects in the public arena starting in 2003. These would include two large pioneer projects in health care and one in areas of educational training that would constitute the foundation for the first telehealth experiments in the public sector in Brazil.

The structuring of Bhtelehealth³⁹, which was implemented in 2003 and coordinated by the Belo Horizonte City Department of Health along with the Federal University of Minas Gerais, seeks to help in the process of the construction of a public health network in Brazil with innovative information technology mechanisms – telehealth resources. These will not only enable the continued improvement of the quality of care provided by the PSF within the Brazilian Public Health System, but also reduce costs. This project, with its subsequent development that propelled the expansion of the use of telehealth resources in the Brazilian public health network, in practice provided the technical conditions for excellence in the process of providing services in the health area. It also broke with a partial and restricted dynamic in the country in which the initiatives for the use of telemedicine/telehealth resources and the modernization of the health care process were concentrated in a few hospitals and a private network.

The Bhtelehealth project was conceived in the search for the construction of a telehealth model that could be adapted to the reality of Brazilian life, the implementation of the SUS, and scarce financial resources with priority given to the advancement of the country's family health project. Therefore, it had to be a low-cost model and consequently one that would be optimized and focused on primary care.³⁹

The project defines its own priority by focusing on primary care, which is the object of a typical kind of intervention by the Brazilian State and whose organization is fundamental for guaranteeing that millions of people have access to health services. In this sense, it would incorporate continuous mechanisms for improvement in the provision of services into the day-to-day care of the public health network, or in other words, the entryway into the system. This would be done through the construction of routine dialogue between the personnel of the public health service and highly qualified resources, the professor of Brazilian public universities. This synchronicity, the incorporation of innovative technologies in the health care process, which would solidify health area in the future, and the process of the formation of human resources, create an unmatched potential for providing services in the health area.⁴⁰

The Bhtelehealth network interconnects Primary Care Units to the teaching units at the Federal University of Minas Gerais (UFMG) and the University Hospital with telehealth activities being developed in the areas of medicine, nursing and dentistry. When formulating the project, two telehealth modalities were chosen: teleconsultations and videoconferences. The teleconsultations may be online or offline. In the first modality, the professionals of the Primary Health Units (UBS) discuss more complex cases by sharing images, voice and data with specialists. With offline teleconsultation, health care questions are answered by electronic mail in a secure environment. Furthermore, in the execution of educational videoconferences, diverse methodologies may be used in addressing subjects depending on the interests of the professional categories involved.⁴⁰

The Schools of Medicine and Dentistry, the School of Nursing, and the University Hospital at UFMG work together to prepare subjects on technical areas, in accordance with the directives of the Belo Horizonte City Department of Health, and give lectures with ample possibilities for interaction already inherent in the model that involves sharing of images, data and *chat*. This interaction between service and academia creates a permanent educational process centered on health care problems that have been recognized in the daily lives of the professionals of the family health teams.

The operation of this telehealth network is only possible due to the extensive integration between the municipal health network in Belo Horizonte and UFMG. It was solidified through financing with resources from the @lis project from European Community and the Brazilian Ministry of Health. The project is a result of both the incorporation of European experiences (*Gruppo Volontariato Civile*, Italy;

North Karelia Hospital District, Finland; Danish Center for Health Telematics, Denmark; *Provincia Autonoma de Trento*, Italy; *Regione Emilia Romagna*, Italy) and the articulation of the powers in the area of information technology, involving the Belo Horizonte City Department of Health, Prodabel (Information Agency of the Municipality of Belo Horizonte) and the Federal University of Minas Gerais. This model has now been implemented in 146 Primary Care Units involving the municipality's 502 family health teams.^{39,40}

Over time, the implementation of this project and its evaluation permitted the initiation of a process of exchanging relevant experiences between Brazil and other countries in Latin America and Europe. Consequently enough, this enabled the construction of the Laboratory of Excellence and Innovation in Telehealth – Latin America and Europe. This laboratory was inaugurated in 2006 and was coordinated by the School of Medicine of the Federal University of Minas Gerais and the Belo Horizonte Department of Health.

Due to its pioneering nature and repercussion, the BHTelehealth project became a successful model for telehealth applied to the public health network in the country. In addition, it was considered the main reference for the formulation and implantation of the National Telehealth Project in Brazil, along with the initiatives in education – using telehealth resources – developed by experiences at the University of São Paulo, with its Virtual Man. These two groups – the Federal University of São Paulo (USP) and the Federal University of Minas Gerais, along with the Brazilian Ministry of Health, are formulating and proposing the bold national telehealth program that currently exists in Brazil.⁴²

The main experiment developed by the University of São Paulo in this area concentrates on the use of telehealth resources in the educational process. The allocation of resources from the Ministry of Health, in 2002, allowed for the development of the Virtual Man Project, which includes dynamic three-dimensional images of the human body. It was prepared by bringing together the knowledge of specialists and the skills of digital artists.^{40,42}

The use of 3D modeling in organic structures enables the construction of virtual learning objects that are capable of simulating physiological, pathological, and anatomical events simultaneously and dynamically. This technique creates the perfect articulation between organic objects and the use of resources such as images, sound and video. It is a perfect combination of specialized doctor-scientific knowledge and digital art. The versatility of the Virtual Man allows for the reproduction of bio-molecular, microscopic and macroscopic structures in the organism, while main-

taining true fidelity with regard to morphology, textures and movement. The first film was created in 2002. It should be noted that there are currently more than hundred films.⁴²

The Virtual Man represents a level of objects for learning within the concept of interactive tele-education that is referred to as Dynamic Directed Communication (CDD). The CDDs are dynamic videos that make use of computer graphics for the purpose of transmitting specialized information in a simple and dynamic manner. Basically speaking, they are graphic representations of a set of knowledge in a pleasant, directed format. With the degree of precision of the information, the CDDs represent iconographic educational modernization, in addition to being a brand new form of communication.⁴²

The School of Medicine of the University of São Paulo develops graphic-computational systems of communication for the health area and has become a national reference. They have a team composed of doctors, who are trained as teachers in telemedicine, systems analysts, a communications strategist, a digital designer, and educational strategists, among others. As a result of the quality of the work, the productions are used by a variety of institutions.

Another important activity being developed at School of Medicine of USP is the creation of the Center for Innovation and Research in Telehealth Solutions, which has assembled a complete structure for the Discipline of Telemedicine, aimed at the development of technological solutions, strategies and logistics in Telemedicine and other support activities for telehealth and tele-education. This center includes the centers for technology, videoconferencing equipment and support for *online* interaction, systems based on the Internet, webconference, a Classroom of the Future, a Graphic Computation Laboratory, an educational video editing station, *WiFi* infrastructure, voice over IP, XML telephony, EPesq Network and a laboratory for digital photography and filming. This structure allows for the education of researchers and professors from other universities across the country in the use of telehealth resources in the educational training processes. This made it possible to structure the project of the millennium, coordinated by USP, whose primary focus was to endow nine Brazilian federal universities with experience in the use of telehealth resources, particularly in the educational environment.⁴² In 2005, a telehealth league was established at USP, whose purpose was the education of students in the telehealth area through participation in actual processes in tele-education and telehealth. This experience was subsequently expanded to the nine university centers that made up the Millennium Project.



Along with this structuring process in the telehealth area in Brazil, the group at USP had a fundamental role in the establishment of the Brazilian Telemedicine and Telehealth Council. In 2003, it held its first congress, which brought a variety of professionals and researchers together to discuss and exchange experiences in telehealth.

The University of São Paulo, in partnership with the Federal University of Minas Gerais, are responsible in the initial phase, for the production of content for the National Telehealth program and the development of innovative initiatives from the pedagogical and technological point of view.

The incorporation of telehealth resources for the purpose of producing content for the education departments of the Federal University of Minas Gerais, particularly at the School of Medicine, was implemented in 2007. It was established with the assembly of the Laboratory of Production of Content whose construction permitted the articulation of platforms for distance teaching and the realization of videos, animation films and organic 3D modeling. This made it possible to create courses for the health area both in the distance and on-site formats – with great added value. Organic 3D models were acquired, so that each of the systems could trace the human anatomy on the same scale and proportion and have the required textures, groupings and coordinates.

The models include quadrilateral polygons and *Edgeloops* modeling which allow for a clean surface when subdivided. The construction process took into consideration the possibility that such models would be seen in video as if they were close-ups from a camera within the human body. This resource allows one to focus on exclusive areas of human organs, with a high image quality. Thus, there are representations of muscles, skin, skeletal structures, the heart and other organic elements in a realistic manner. These resources, along with animation and interactive videos, have made it possible to offer distance courses with great pedagogical impact.

Another important aspect the School of Medicine at UFMG focused on, in relation to its production of content, refers to the improvement in the methodology for the preparation of courses. This preparation involved a pedagogical foundation for distance learning based on “instructional drawing” with a definition of skills, essential abilities, and performance standards. This focus allows for a better evaluation of learning.

The Laboratory of Production of Content has also utilized stereoscopic resources – the juxtaposition of two images of the same object with different colored channels – for the structuring of distance courses. The use of stereo-

scope, using the anaglyphic method, was chosen so that representations created with computer graphics would look more like real anatomical objects through the sensation of three-dimensionality. This sensation is made possible with the use of special eyewear. The production of images with stereoscopic effects can be a powerful tool for facilitating the spatial visualization of anatomical models and the representation of complex questions in the medical area.

This structure was built at the Center for Health Technology (CETES) at School of Medicine of UFMG, for the production of content. It employed the customization of the *moodle* platform in order to be able to incorporate telehealth resources. It also allowed for the production of dozens of virtual learning objects, various distance courses, and didactic animations.

Another pioneering health care experience in the country, in the public health network, is the NUTES Network, Network of Telehealth Centers (*Rede NUTES*), created by the Federal University of Pernambuco (UFPE), in 2003. This project was financed by the Ministry of Health. The main objective of this network was to increase the resolution rate of the family health program through telehealth services. This network was initially established in four municipalities in the metropolitan region of Recife, which is the capital of the state of Pernambuco.⁴³

Five centers were established: the NUTES at the Clinical Hospitals of UFPE, at a polyclinic in Recife, and in the municipalities of *Cabo de Santo Agostinho*, Camaragibe and Igarassu. With the identification of a demand and telehealth technologies that were better suited to the reality of these municipalities, services involving distance education through internet-based videoconferencing and cooperation in health were provided to the partner municipalities of the NUTES network, utilizing software for administration of teleconsultations – *Healthnet*.⁴³

The NUTES network was assembled based on the structuring of videoconference classrooms, with high-resolution equipment. Such equipment allowed professionals to travel from their care locations to the videoconference classrooms where they could interact with the teachers from UFPE and their colleagues from other municipalities. The project was also directed at the PSF teams, who regularly attended the virtual lectures.⁴³

Also between 2003 and 2006, the country implemented other important experiments in the telehealth area of the public health network, accumulating experience and improving conditions for making a national telehealth program possible. In 2004, telehealth activi-

ties began, on a small scale, in the State of Amazonas.⁴⁴ The area known as the Brazilian *Amazônia Legal* corresponds to 60% of Brazilian territory and contains 21 million people. Thus, it qualifies as a priority region – both because of its territorial expanse and for the isolation of the professionals responsible for care in telehealth projects. The project, which was initially implemented, grew out of the necessity for offering educational content and improving technical-professional skills and health care. It was also an opportunity for providing doctors, practicing in *Amazônia*, with second opinions. The project began with the teletrauma continuing education program. It was used in surgery for trauma and emergency and was offered to doctors of the surgical institute of the State of Amazonas and the academic community.

In 2005, the Telemedicine Center of *Amazônia* hosted a “Continuing Education Program for Doctors of the Countryside of Amazonas” through a partnership with the Federal Medicine Council (CFM) and the Regional Medicine Council (CRM/AM). This program provided educational medical content and training for all of the 207 doctors, who practice in the 61 municipalities of Amazonas, by providing the delivery of *CD-ROMs* with the classes for each monthly module to every doctor participating in the program.⁴⁴ In 2005, the Telemedicine Center of *Amazônia* began to support the Rural Internship Programs for Telemedicine of the State University of Amazonas (UEA) and the Federal University of Amazonas.⁴⁴

In the area of radiology, important experiences in the public health network are being consolidated in the country. In 2005, in the state of Rio de Janeiro, a network was established in the area of teleradiology, with the objectives of conducting monthly teleconferences, bringing together the Fluminense Federal University, the State University of Rio de Janeiro, the Federal University of Pernambuco, Santa Catarina and Minas Gerais, and implementing the digitalization of all of the Radiological Services of HUAP/UFF. The network was successful and is currently up and running.⁴⁵

Also in 2005, the Department of State of Santa Catarina and the Federal University of Santa Catarina implemented the Catarinense Telemedicine Network, intended to interconnect 40 points in the state. The goal was to implement the large-scale production of routine tests in conjunction with the process of regulation of associated decision-making procedures, utilizing customized tools for structuring PACS – Picture Archiving and Communication System. The network will operate the following types of tests: ECG, CT, MRI, X-ray and mammograms for routine

distance diagnoses and angiograms, SPECT, US, endoscopy, bronchoscopy, colonoscopy and echocardiography for electronic access to tests.

The project called for the tests to be executed at the most distant points in the Network or closest to the patient’s city of residence and to be performed by professional technicians. The tests are to be sent to the server at the Telemedicine Center and made available to the team of professional doctors assigned to the Telemedicine Center in Florianópolis who are responsible for diagnosis at a distance. In addition, they are responsible for distributing the tests to various other main cities. A sequence of tests is selected and reviewed by a telehealth doctor in one of the main cities and then, the reports are filed together with the images or signals on a web page that is available to the requesting doctor and to the regulating commission of a local Regulating Center. Upon review, they will decide on the possible hospitalization of the patient or for additional procedures, in the case they are requested by the original doctor or by the telehealth doctor.⁴⁶

In addition to these operations with PACS, the project specified that the tests and respective image data should be available wherever there is Internet access to the system. This would not only make it easier to use once a doctor requested such service, but would also allow use from any computer at any location. This project began in 2005 and is currently operating in hospitals in the countryside of the state of Santa Catarina.

In June of 2006, the project Minas Telecardio was set up in Minas Gerais, under the coordination of the University Hospital of UFMG, with the initial objective of implementing telecardiology services in 82 municipalities in the state of Minas Gerais. This project was set through an agreement adopted by five universities in the state (UFMG, the Federal University of Uberlândia, the Federal University of Triângulo Mineiro, the State University of Montes Claros and the Federal University of Juiz de Fora) and the State Department of Health. The telecardiology activities are to be developed through the utilization of 12-derivation digital electrocardiographs installed in the municipalities that will send their tests to the universities involved. Each municipality also receives a microcomputer with an advanced configuration, a *webcam*, and a printer. Each university center was equipped with 2 workstations made up of microcomputers, *webcam*, and equipment for 1 videoconference. The central technological structure is established at UFMG, with an extra *backup* server at another university. The staff on duty is responsible for the analysis of the tests,



for preparing a report, and for initiating *online* discussion of clinical cases when necessary. The service of a support technician is also offered to the municipalities in a rotating residency schedule. A virtual receptionist was instituted to speed up the work of the doctor on call so that he or she may concentrate on clinical activities. The receptionist is responsible for reception, prioritization, and delivery of the tests to the municipalities. The methodology used follows the logic of what occurs in a doctor's office. The only exception is that one is dealing with the inherent virtual nature of the teledoctor process. The Minas Telecárdio project is currently being operated in 182 municipalities in the state of Minas Gerais.⁴

As these telehealth activities are being developed, the SUS continues its structuring process. In 2006, considering the advances the SUS made in the process of decentralization and construction of a universal system, a broad coalition proposed mechanisms for interaction between the distinct levels of government, focusing on objectives agreed to between the three levels: federal, state and municipal. Innovations were proposed in forms of administration, the redefinition of responsibilities for sanitary results given the needs of the population, and the search for social equality. With Decree nº 399/gm of February 22, 2006⁴⁸, which established the health pact, the Ministry of Health, the National Council of Municipal Department of Health (CONASS), and the National Council of Municipal Departments of Health (CONASEMS), "agree to responsibilities among the three administrators of the SUS in the areas of system administration and health care."⁴⁸

The document addresses the pact signed among the three administrators of the SUS, beginning with a unity of principles which, maintaining the coherence with existing operational diversity, respects loco-regional differences, aggregates previous pacts, reinforces the organization of sanitary regions instituting mechanisms for co-management and regional planning, strengthens spaces and mechanisms for social control, qualifies the population's access to integral health care, redefines the instruments of regulation, programming and evaluation, values the macro function of technical cooperation between the administrators, and proposes tripartite financing that stimulates criteria for equality in fund to fund transfers.⁴⁸

The pact addresses three areas. First, it is a pact in favor of life, with agreement on six priorities including: health for the elderly; control of colon cancer, uterine cancer, breast cancer; reduction of infant and maternal mortality; strengthening of the capacity to respond to emerging and

endemic diseases with an emphasis on dengue, hansen's disease, tuberculosis, malaria, and influenza; promotion of health; and strengthening of primary care. Second, it is a pact in defense of the SUS, whose priorities include defending both health as a basic right for all citizens and SUS as a universal public system that guarantees those rights. In addition it seeks to attain, in the short run, compliance with the regulations set forth by the constitutional amendment no. 29, passed by the national Congress. In the long run, it seeks to guarantee the expansion of budget and financial resources designated to health and to agree on and pass a budget for SUS, which is composed of budgets from the three administrative spheres. As a result, it should define the commitment of each sphere. The pact should also elaborate and publish a bill of rights for users. Third and finally, it is a pact for the administration of the SUS. It has several priorities which include the following: explicitly defining the sanitary responsibility of each administrative level related to the SUS; establishing the guidelines for the management of the SUS, with an emphasis on decentralization; regionalization, financing; integrated and mutual programming; regulation, social participation and control; planning, and labor management in education and health.

In practice, from the point of view of financing for primary care, the Administrative Pact seeks to overcome current fragmentation by eliminating the link between incentives and coverage areas. The Pact for Life reiterated that the priority is the consolidation and qualification of Family Health as the model for primary care and the organizational core for health care networks. The establishment of the pact for health between administrators at the three levels of government allows the SUS to begin to pursue objective goals, with regard to the expected, results from the perspective of health care in the areas considered to be priorities and established by the pact. These would, in turn, generate a strong and dynamic incentive for the federal government to achieve positive changes in relation to health indicators in the country. This process creates inter-institutional agreements, which are linked to the global allocation of resources, and, therefore, make it a powerful instrument for the consolidation of actions on the primary level, particularly the PSF. It is in this context, based on a series of actions attempting to consolidate the PSF, that the Ministry of Health passed, through Decree 35, on January 4, 2007, an audacious telehealth program – National Telehealth Program. It was passed with the objective of reaching 900 Brazilian municipalities and providing them with telehealth resources for health care and educational activities.³⁸

The National Telehealth Program in Brazil is formulated and based on the two great experiments in telehealth realized in the country, one by UFMG in healthcare area, and the other at USP in education. It should be noted that aside from these two institutions, the participation of BIREME, the Brazilian Association of Family and Community Medicine, the Federal Medicine Council, the Pan-American Health Organization, the Head of State, the Ministries of Science and Technology, Defense and Telecommunications are all central to the program. The program includes nine university centers that have some experience in telehealth and is located in nine different states, with each center responsible for an average of hundred municipalities.

It has two major areas of intervention, directed by PSF teams: the health care area, with the establishment of online and offline teleconsultations and educational training, calling for the structuring of distance courses and the setting up of videoconferences that incorporate 3D modeling, animation and the production of videos. In addition, it calls for the structuring of a large network for making material available that focuses its attention on primary care. This aspect is coordinated by BIREME with the participation of the Brazilian Association of Family and Community Medicine.

All of the centers, to the extent that they were inserted in the project, shared and contributed with their experiments in the process of the formulation and implementation of the program. According to Campos *et al.*⁵⁰, the National Telehealth Program in support of Primary Care is being developed as a structural action in the human resources area seeks to support the continuing training and education of the teams of the Family Health strategy. It is developed by the Department of Management of Labor and Education in Health in a partnership with the Department of Primary Care of the Secretary of Health Care (DAB/SAS). The objectives of the program seek to offer more favorable conditions for establishing health professionals in remote locations that present difficulties in access; to reduce costs with treatment outside of the municipality, while still allowing patients to receive outside treatment in cases that represent medium and high levels of complexity; and to provide the family health teams with a method for remote contact with specialists in an organized manner. This program, focused on primary care, allows for the full use of the resources allocated at this level of care through the aggregation of technology. At the same time, it manages to lower the cost of care. By keeping patients at this level of care and qualifying those who truly need secondary attention, an impact is made on the cost of care offered.

In this regard, the incorporation of telehealth resources in Brazil can influence the overall cost of the system.

There are currently more than six hundred municipalities using the National Telehealth Program, creating a dynamic in the development of telehealth activities in the country. Since 2007, this program has been structured at the university centers responsible for the implementation of the National Telehealth Program as the driving force.

The National Telehealth program in Brazil has broken down the old, fragmented development of telehealth, which was centered on private medical institutions that had high levels of quality but little social repercussion. This program, in Brazil, allows telehealth to become established as an element of national health policy, transforming it into public policy and enabling the public health network to utilize modern technologies to carry out the health care process and the organization of the system. The program has broad coverage, reaching more than ten million people, and establishing the professionals of the PSF as the gateway to the system.

It originated from a conception that was highly dispersed and that adapted itself in accordance to other telehealth experiences in progress. It also creates incentives for the development of specific skills, with states focusing on telecardiology, teleophthalmology, specific pathologies, etc. and seeks integration with a set of governmental initiatives. The program depended on the participation of other ministries including the Ministry of Education, Ministry of Telecommunication, the Army and the Secretary of State.

It was also guided by a multidisciplinary process of actions, bringing together activities in medicine, nursing and dentistry. This process placed professionals at the head of the health system. In other words it placed the PSF teams that provide care and promote health, directly in contact with professors from the best Brazilian universities. As a result, one has a highly qualified process related to human resources and guidelines for promoting and providing care.

The two major components of the National Telehealth Program – care and educational training – address the obstacles faced in the process of constructing a new model. This would ultimately include the difficulties related to the educational training of professionals and the adoption of a new logic for the structuring of health activities, which would, in turn, represent a change from the treatment model to a preventative one. It is an attempt to increase the potential of the performance of the professionals of the PSF. In essence, it deals with training the professionals so that they become qualified to work within the context of



the new model, with the introduction of a new tool for care that relies on the incorporation of information technology at the disposal of primary care. In practice, primary care incorporates technological tools in order to enable intervention, which, in turn, increases its ability to solve cases and provides it with mechanisms for interaction between distinct levels of care. In general, the structured use of relying upon a second opinion is not a part of the organization of service in medical practice. We are not dealing here with a question of incorporating technological resources into an existing practice. We are dealing with the fact it is a practice that is being initiated as a result of the possibilities offered by the technological resource. Thus, it can be characterized as the institutionalization or installation of a new tool into the health care routine and not simply a process of incorporating information technology. The public sector in Brazil is providing the public health network with technological resources so that health care, through the PSF, can make use of the whole technological arsenal at its disposal with the intention of intervening at this level of attention and care.

Another important aspect of the National Telehealth Program concerns the contribution being made so that the public health network can benefit from connectivity. This implies in the interconnection of the units of the nine hundred municipalities in the country to the nine Brazilian universities and the DATASUS network, which is the data processing and information technology company of the Ministry of Health. This makes it the health sector's largest expansion project today, in the sense of creating a capillary structure for a network of data in the public health area that starts off with a total of nine hundred municipalities.

In the context of the institutionalization of telehealth activities, on March 16, 2006, the Ministry of Health created a permanent telehealth commission with the following attributes: consulting on telehealth projects underway at the Ministry of Health; preparation of a proposal to establish standards for exchanging information; evaluation of the quality of projects in telemedicine and telehealth; study and evaluation of proposals for reimbursing services developed by universities and hospitals in the health area through the use of telemedicine and telehealth resources; systematic monitoring of continuing professional education through telehealth; creation of a strategic information data base on the implementation of telemedicine and telehealth; development of cooperative studies with different governmental agencies and private sector entities to facilitate the structuring of telemedicine and telehealth in the country;

the constitution of an Advisory Council on Telemedicine and Telehealth and the identification and establishment of a group of Collaborator Centers.

Also in 2006, the University Telemedicine Network (RUTE) was established. This was an initiative of the Ministry of Science and Technology, supported by the Department of Finance for Studies and Projects (Finep) and the Brazilian Association of University Hospitals (Abrahue) - and coordinated by the National Teaching and Research Network (RNP). The objective of RNP is to promote the expansion and consolidation, on the national level, of the Telemedicine networks that already exist in the country by providing connectivity as well as a portion of their information technology and communication equipment. This network will allow University and Teaching Hospitals, in different regions of the country that develop Telemedicine projects, to establish communication and cooperation between national and international research groups through the RNP based on the use of advanced applications.⁴¹ Currently, there are already nineteen university hospitals connected, with a future goal of expansion to thirty eight more institutions. RUTE maintains an agenda for the discussion of clinical cases in various areas of knowledge, connecting national and international research groups through the RNP.

Four types of results are expected from the RUTE project: 1) for each institution served by RUTE, the result will be the implementation or the expansion of a Telemedicine Unit equipped for national and international collaboration through the services of advanced network applications, resulting in the consequent reduction of costs and/or improvement of services; 2) the results of this model of integration of health entities, through high-performance networks, can contribute to the development of solutions for other organizations and/or state or municipal governments and; 3) with the creation of a Consulting Committee for orientation in the innovative use of health networks and Groups of Interest around specific themes, the result will be the guarantee of the integrated evolution of telemedicine procedures on a national scale; 4) with the adoption of telemedicine procedures, the result will be the presentation of collaborative projects, demonstrations, events, lectures and courses.

By the end of 2007, the Ministry of Science and Technology will also begin to incorporate the telemedicine/telehealth area in its bidding processes for the financing of projects, seeking the development of software solutions and national equipment for the area and closing the circle of investments needed for consolidation of this area in the country.

FINAL CONSIDERATIONS

The development of the SUS and the telehealth activities underway in Brazil are in the process of consolidation, with clear prioritization on structuring the health care model based on the PSF. The development of telehealth activities as a state policy must be placed in this context while at the same time giving the process potential. This would, in turn, qualify the process and establish it as a great and far-reaching technological arsenal available to its professionals, along with an effective structure for initiatives that motivate dialogue about the structure of university teaching and public service, both at the educational as well as the health care levels. It represents a powerful encounter, in which the parts build on each other and increase each others' potential. This creates the basis for a new model in which the structures for the establishment of human resources have an important role. For the Brazilian scenario, more than just incorporating telehealth resources, the national program has broken the serious isolation of professionals as well as teaching/service institutions, in an environment of enormous challenges to the structuring of the SUS in the country, particularly at its entry level.

The process of implementing the PSF in the country, which is deeply linked to popular participation and the insertion of professionals, who both interact with health problems in their own communities and take on responsibility for a group of people, contributes to the construction of a public space, that can be, par excellence, a space for diversity and of liberty. Essentially speaking, it is a space that seeks universality.

The dichotomy between the public and private sectors has led to a new discovery of the law and rights that are strengthened and renewed in the practice of representation, interlocution and negotiation of interests. Nevertheless, it is also a space of conflict, a result of past practices of structuring a health system and educational training that are deeply rooted in a model of organization of society that is highly elitist and exclusionary. The SUS and the PSF are being established from a perspective of social inclusion and of a firm determination as to the need for changes to the paradigms in the structure of the health care model. It considers, therefore, the country in all its complexity and vast territory.

The Telehealth Program, as an active part of the process of the construction of the SUS, is placed in the following context. First, it contributes to the service/university dialogue by bringing these participants closer and renewing the challenges they face. Second, it presents important

initiatives aimed at eliminating isolation with modern methods by using the virtual dimension for the construction of interaction and collective processes. These are consequently fundamental for the organization of health care models that have the PSF as their level of entry. It also finds itself within the challenge of providing qualified health service, whether it be from the dimension of care or educational training. In essence, we are dealing with the fact that the Brazilian public health network establishes a dialogue, with its university professors, in a systematic and continuous manner, that stimulates a process of growing interaction.

There are still great challenges that need to be confronted. One of the challenges is due to the fact that the consolidated models for educational training structures tend to reproduce themselves beside realities that lead to rethinking the educational process for the university. Yet another challenge is related to the aspects and potential of actions in primary care in the country, whose structures are still not consolidated and require the establishment of positive experiences. This would, in turn, not only make them available but would also stimulate more experiences. Finally, there is the challenge of inserting technological resources at a new level capable of reinventing the very structuring of processes for referrals and flow of health care with the help of the virtual dimension.

Nonetheless, the Brazilian telehealth experience, considered to be bold and innovative, has provided concrete positive results, particularly since it gradually modernizes the face of the SUS in Brazil. The educational process is slowly making its way to the vast state. The continuing education of professionals, who are responsible for guaranteeing quality care, continues to strengthen itself. In this manner, Telehealth and PSF are being established in the country, in an attempt to make the most of the process of change to the health care model. We can certainly say that telehealth has already become a significant part of the history of public health in Brazil.

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