



UNIVERSITÀ
DEGLI STUDI
FIRENZE

FLORE

Repository istituzionale dell'Università degli Studi di Firenze

The Telehealth Brazil Networks: a socially-engaged technological system

Questa è la Versione finale referata (Post print/Accepted manuscript) della seguente pubblicazione:

Original Citation:

The Telehealth Brazil Networks: a socially-engaged technological system / Botrugno Carlo, Marcia Santana Fernandes, Roberto J. Goldim. - In: REVISTA LATINOAMERICANA DE TELESSAÚDE. - ISSN 2175-2990. - ELETTRONICO. - (2019), pp. 44-58.

Availability:

This version is available at: 2158/1204019 since: 2020-08-26T16:49:36Z

Terms of use:

Open Access

La pubblicazione è resa disponibile sotto le norme e i termini della licenza di deposito, secondo quanto stabilito dalla Policy per l'accesso aperto dell'Università degli Studi di Firenze (<https://www.sba.unifi.it/upload/policy-oa-2016-1.pdf>)

Publisher copyright claim:

(Article begins on next page)

The telehealth Brasil networks: A “socially engaged” technological system

Carlo Botrugno

Doctorate; University of Florence; Department of Legal Sciences; Research Unit on Everyday Bioethics and Ethics of Science.
Contact: carlo.botrugno@unifi.it; Campus Novoli – 35; Via delle Pandette 50127; Italy.

José Roberto Goldim

Doctorate; Hospital Clinics of Porto Alegre; LAPEBEC; Santa Cecilia; Porto Alegre; Brazil.

Márcia Santana Fernandes

PhD; Feevale University; LAPEBEC; Santa Cecilia; Porto Alegre; Brazil.

Date of Receipt: April 09, 2019 | Approval date: May 03, 2019

Abstract

Introduction: The reflection on the “socially mediated” character of technological devices is a classic theme of Science and Technology Studies (STS). Objective: Evaluate the socially engaged character of the Telehealth Brasil Redes project implemented in Brazil. Method: A favorable opportunity to reconcile the STS perspective with a broader view in the scope of research on the forms of territorial displacement of health care processes is the case of Telehealth Brazil Networks. Results: Its characteristics narrow the relationship between the network design and Unified Health System (UHS) purposes, offering useful elements to a theoretical-conceptual reading of the implanted service structure. In contrast to the telemedicine standard, the service of Telehealth Networks Brazil advances beyond the classic scheme of “social mediation” of technological artifacts, aiming to expand access to health care services guaranteed public health system, a factor that democratizes and reduces inequalities among system users. Conclusion: In addition, by proposing a connection between the different health professionals, Telehealth Networks operates beyond the “local medical ecology”, valuing the importance of social relations between the family health teams and the communities served.

Keywords: STS; Technological Innovation in Health; Telemedicina; Telehealth; Collective Health.

Resumen

El telesalud Brasil redes: Un sistema tecnológico “socialmente comprometido”.

Introducción: La reflexión sobre el carácter “socialmente mediado” de los dispositivos tecnológicos es un tema clásico de los Science and Technology Studies. Objetivo: Evaluar el carácter socialmente comprometido del proyecto Telesalud Redes Brasil, implantado em Brasil. Método: Una oportunidad favorable para conciliar la perspectiva de los STS con una visión más amplia en el ámbito de la investigación sobre las formas de desplazamiento territorial de los procesos de cuidado en salud es el caso del Telesalud Brasil Redes. Resultados: Sus características estrechan la relación entre el diseño de la red y las finalidades del SUS, ofreciendo elementos útiles a una lectura teórico-conceptual de la estructura del servicio implantado. En contraposición al estándar de la telemedicina el servicio de Telesalud Redes Brasil avanza más allá del clásico esquema de la “mediación social” de los artefactos tecnológicos, teniendo como objetivo ampliar el acceso a los servicios de cuidado en salud garantizados sistema público de salud, factor que democratiza y reduce las desigualdades entre los usuarios del sistema. Conclusiones: Además, al proponer una conexión entre los diferentes profesionales de la salud, el Telesalud Redes opera más allá de la “ecología médica local”, valorizando la importancia de las relaciones sociales entre los equipos de salud de la familia y las comunidades atendidas.

Palabras-clave: STS; Innovación Tecnológica en Salud; Telemedicina; Telesalud; Salud Colectiva.

O telessaúde Brasil redes: Um sistema tecnológico "socialmente engajado".

Introdução: A reflexão sobre o caráter "socialmente mediado" dos dispositivos tecnológicos é um tema clássico dos Science and Technology Studies. Objetivo: Avaliar o caráter socialmente engajado do projeto Telessaúde Brasil Redes implantado no Brasil. Método: Uma oportunidade favorável para conciliar a perspectiva dos STS com uma visão mais ampla no âmbito da investigação sobre as formas de deslocação territorial dos processos de cuidado em saúde é o caso do Telessaúde Brasil Redes. Resultados: As suas características estreitam a relação entre o design da rede e as finalidades do SUS, oferecendo elementos úteis a uma leitura teórico-conceitual da estrutura do serviço implantado. Em contraposição ao padrão da telemedicina o serviço de Telessaúde Brasil Redes avança além do clássico esquema da "mediação social" dos artefatos tecnológicos, tendo como objetivo o de ampliar o acesso aos serviços de cuidado em saúde garantidos sistema público de saúde, fator que democratiza e reduz desigualdades entre os usuários do sistema. Conclusão: Ademais, ao propor uma conexão entre os diferentes profissionais da saúde, o Telessaúde Brasil Redes opera além da "ecologia médica local", valorizando a importância das relações sociais entre as equipes de saúde da família e as comunidades atendidas.

Palavras-chave: STS; Inovação Tecnológica em Saúde; Telemedicina; Telessaúde; Saúde Coletiva.

Introduction

Innovation, technology and social context from the perspective of Science and Technology Studies

The reflection on the "socially mediated" character of technological devices is a classic theme of Science and Technology Studies (STS)^{1,2,3,4}. The studies produced by the authors that form part of this current thought played a fundamental role in the construction of a reaction to the deterministic-mechanistic view, on the basis of which innovation is understood as a factor (x) that produces a certain impact on society and/or social interactions (y), and from which some identifiable effects (z) are derived, thus obeying a linear sequence model of the type: $x + y = z$. The authors who belong to the current thought of STS have demonstrated how the development of a technological system does not consist in the creation of an object intrinsically endowed with meaning, but rather in the cultural production of new practices, so that technology is always mediated by social practices which make it a technology-in-use⁵.

In the specific context of "remote" health care models - from telecare to telehealth, through telemedicine and e-Health to the latest mobile Health - some authors, revitalizing a constructionist perspective⁶ have contributed to the development of a theoretical-conceptual apparatus useful to the understanding of the various phases in which the social processes implicit in the design formation and construction of medical device technologies are articulated^{7,8,9}. To problematize the relationship between device technology and health professionals' practices through the lens of technology-in-use⁵ has demonstrated the incidence of professional practices, both individual and social nature, recurring in the actual functioning of the apparatus, and the difficulties related to the use of these innovations in the routine of a hospital environment. These reflections have progressively challenged the "triumphalist rhetoric" of telemedicine^{10,11}, which, by legitimizing medical literature¹² officially entered the political-institutional agenda of national States and regional organizations in the European Union and the United States.

Within the STS current thought, however, some authors¹³

expressed a critical - or rather, self-critical - position that aimed to evidence the excessive preference in STS studies for micro interaction problems, such as the relation between the doctor and the patient; the relationship between routine practices and innovations; the human-machine interaction, etc. This preference left in the background the analysis of factors of a macro nature, related to cultural, social, political and economic aspects, which influence the definition of a public strategy for technological implementation, or, on the contrary, prevent its development¹⁴. The purpose of this article is to evaluate the socially engaged character of the Telehealth Brasil Redes project, implemented in Brazil.

Method

There is a favorable opportunity to reconcile the STS perspective with a broader view in the scope of investigations on the forms of territorial displacement of health care processes. Telehealth Brasil Redes can be an example of this project, because its characteristics narrow the relationship between the Network design and UHS purposes, offering useful elements to a theoretical-conceptual reading of the implanted service structure. The study on Brazilian Telehealth Networks can, therefore, be an opportunity to reconnect the STS perspective with the analysis of the social, political and economic structures that underlie the implementation of medical devices, thus renewing a useful research plan for to problematize the ways in which technology redefines and models the social meaning of medicine^{15,16}.

Result and Discussion

The Unified Health System: from decentralization to the humanization of Basic Health Care

Brazil is a Federative Republic that covers an area of 8,515,762 km² and with 200.4 million inhabitants, being the fifth most populous country in the world. The recent history of Brazil is characterized by the transition from dictatorial rule to democratic institutions, inspired by a movement of renewal and reforms aimed at the granting of social

rights^{17,18}. The wide popular legitimization and the intense participation of intellectuals and specialists from the 1980s onwards led to initiatives in the public health sector to overcome the restricted theoretical reading of the relationship between health and disease. Health, therefore, was conceived as a good that should be constitutionally protected and not be treated solely for its welfare character, but also integrate global actions, capable of interfering in the social conditions external to the health system.

The ethical-political connotations of the health reform movement were fully integrated with the UHS - the essential lines of which are outlined in the 1988 Constitution and then specified by successive regulations (Law no. 8,080 / 1990 et seq.) - reflected in the prediction of processes for popular participation in the definition of public health defense policies (Constitution of the Federative Republic of Brazil, 1988, article 198). In the context of UHS, health protection is a duty of the State, as well as a citizen's right, which is why it must be guaranteed through "social and economic policies aimed at reducing the risk of disease and other grievances and universal and equal access to actions and services for their promotion, protection and recovery" (1988 Constitution, article 196).

Among the founding principles of the UHS there is also the concept of integrality, in virtue of which the response to the population's health needs is structured as an "articulated and continuous set of preventive and curative actions and services, individual and collective, required for each case in all levels of complexity of the system" (Law 8080/90, article 7). The defense or "integral" promotion of population health appears closely related to the adoption of a guideline inspired by the principle of decentralization (Constitution of the Federative Republic of Brazil, 1988, article 198) through which the rupture with the model during the dictatorship regime, when these activities were submitted, at a federal level, to a centralized and descending character management model.

The proximity between health management activities and the local population in Brazil has elevated the territory, and more specifically the municipality, to the role of protagonist in the organization of health protection activities, contributing to a renewed importance to the concrete person (citizen and patient), thus highlighting the abstract user-subject's vision and printing the principle of decentralization.

The principle of decentralization is implemented through a model of Basic Health Care, represented by the Family Health Program (FHP), now called the Family Health Strategy (FHS), which has acquired a great importance in the actions of UHS already since its creation in 1994¹⁹. The FHP foresaw that basic health care activities were carried out through the work of the Health Teams, that is, groups of locally installed professionals (residents) with the task of "taking responsibility" for the health of a certain number of families in the territory of each municipality. The Health Teams are formed by a

doctor, a nurse, a nursing assistant, and other professionals (from 4 to 6) with basic training in hygiene, nutrition, pregnancy management, epidemiology, and infectious diseases. The latter assume the role of "Community Health Agents" and their function is to monitor the health conditions and diseases of the local population, identifying the problem, advising preventive actions and evaluating the evolution of cases through periodic home visits.

In order to fully understand the structure and objectives pursued by the UHS, however, it is necessary to refer to some specific strategies, such as the National Policy on Permanent Education in Health (NPPEH, 2003) and the National Humanization Policy (NHP, 2004). Through these transversal policies, the construction of theoretical premises for the development of actions of reorientation of practices of health protection and training in the health area¹⁸. Conceptually, Permanent Education must be distinguished from Continuing Education, which, unlike the former, is carried out through training activities aimed at updating the competencies of health professionals. The concept of Permanent Education was adopted to favor the meeting between training, management, social participation and health protection, understood as specific areas of knowledge and practices that, starting with constructivist references of "teaching-learning", move on the common ground of health promotion of the population¹⁸. Still, Permanent Education develops around the fundamental principle of meaningful learning, based on which the work of Health Care is understood as composed of elements that "make sense" for the professionals who work in the system. By assigning to the latter an active position in the critical reflection on professional practices, the Permanent Education Policy aspires to promote changes in the organization of processes on which the response of the health system depends²⁰.

In close correlation with the critical reflection on the daily practices of health professionals, NPPEH is driven by the conviction that the inclusion of people and groups (networks and collective subjects) that concretely make up the UHS and who contribute their own work to delineate the contours of the system, constitutes a factor capable of challenging the consolidated models of attention and management linked to the predominance of the biomedical paradigm, thus favoring the acquisition of consciousness on the part of the same subjects involved. The Humanization policy has the objective of increasing the degree of co-responsibility of the different actors, interfering in the processes of health production and proposing alternative ways of acting within the UHS. Based on this strategy, the objectives of change in the defense culture offered to patients and in the management of professional processes can be obtained by placing the right of patients in the center and, therefore, recognizing the possibility of assuming an active role in the social control system and health production²¹.

Telehealth Brazil Networks: structure and functions

The implementation of the Basic Attention model achieved an improvement in the general health conditions of the Brazilian population despite the difficulties of territorial coverage²². However, access to the specialized level represents one of the major problems of the current UHS organization²³. The reduced supply of hospital centers throughout the country impedes the appropriate care of the needs and specialized services^{24,25}. The emergence of Telehealth Networks, therefore, appears from the outset directed towards the purpose of reducing the physical distance that separates the Health Teams from the provision of specialized care. The system is developed in the beginning from the Telemedicine University Network²⁶, which was separated in 2007 through an experimental project (Decree n. 35/2007) involving nine federal States (Amazonas, Ceará, Goiás, Minas Gerais, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, São Paulo), and is definitively consolidated in 2011, when it takes the form of the current National Telehealth Networks Program (Decree n. 2546/2011).

Telehealth is composed of an information and communication technology (ICT) platform that, through spokes called Telehealth Points, connects to the Health Teams scattered in the territory to the hubs, the Telehealth Centers that are within the university hospital centers. The primary objective of the service is to contribute to professional qualification and support to Basic Care assistance procedures through Teleconsulting, Telediagnosis, Second Formative Opinion, and Tele-education^{18,27}. These activities can be performed in simultaneous forms (webchat or audio/video connection), as well as offline, by sending messages from the Point to the Nucleus (with a response time of up to 72 hours). The requests that arrive at the Nucleus are generated by a doctor with specific experience in the scope of basic care, who assumes the task of Tele-regulator, mediating them and sending them to the competent professional in the internal organization chart. The Telehealth Center also carries

out technical support actions, monitoring and evaluation of work organization processes, confrontation and discussion for the implementation of national health policies, programs, data collection and analysis²⁸.

One of the characteristics that distinguish, in particular, the system of distance health benefits in Brazil - and, therefore, also the operability of Telehealth - is the prohibition of virtual meetings between the doctor and the patient. Since 1988 (Resolution No. 1/246 1988) the Code of Medical Ethics has barred the physician from "prescribing treatment or other procedures without direct examination of the patient, except in cases of urgency and a proven impossibility of performing it, and, in this case, do it immediately cease the impediment" (art. 39 of the Code of Medical Ethics 2009, ex art. 62). The Code also prohibits the physician from "giving consultation, diagnosis or prescription by means of any mass communication vehicle" (art. 114 of the Code of Medical Ethics 2009, ex art. 134). The Federal Medical Council (FMC) reinforced this prohibition by forbidden: "to the physician in any form of knowledge transmission, teaching private medical procedures to non-medical professionals" (art. 1, Resolution n. 1/718 2004). The value of a prohibition that is so incisive for the development of Brazilian telemedicine can be questioned both under the aspect of its opportunity^a, both considering the fact that it was not established by a federal agency linked to the Ministry of Health, but by a Council representative of a class of professionals, which is the Federal Council of Medicine, which, in fact, has no legal personality under public law^b. However, FCM, in relation to the diffusion of means of distance communication, considered that medicine was "the one that benefited the least", highlighting, however, the ethical and legal uncertainties in many aspects for the sedimentation of the practice of telemedicine. Literally, according to Opinion n. 36/2002 says the text: "Ethics and Law have not yet given us the safe route to be followed, especially in relation to information privacy, professional secrecy, and the responsibility of the assistant physician and the duty physician at the call center and transmission of data"^c.

a. The opportunity of this form of interdiction represents today is an object of discussion, with FCM that in February approved a Resolution that aimed to regulate telemedicine services in the country - Resolution FCM n° 2.227, published in D.O.U. (Official Diary of the Union) of February 6, 2019 -, and soon after revoked it with this motivation: "Due to the high number of proposals submitted by Brazilian physicians to change the terms of FCM Resolution 2.227/2018 - which defines criteria for practice of telemedicine in the Country - which have already reached 1,444 contributions so far, in addition to the clamor of numerous medical entities, who ask for more time to analyze the document and also send their suggestions for change; and, finally, in view of the time needed to complete the stages of reception, compilation, study, organization, presentation and deliberation of all the material already received and of what will still be received, allowing a careful analysis of each of these contributions, with the objective of giving physicians and society in general an instrument that is effective in its function of regulating the physician's performance and the provision of medical services at a distance mediated by technology, being sensitive to the manifestations of the Brazilian physicians and the entities representative of the class, I request to revoke FCM Resolution no 2.227 / 2018. "FCM Resolution n° 2288 / 2019.

b. According to Law n. 9.649, of May 27, 1998, which provides for the organization of the Presidency of the Republic and of the Ministries, in effect: "The services of inspection of regulated professions [are] exercised privately, by delegation of the public power, by means of legislative authorization". In the same sense, the current version of the statute of the Federal Medical Council attributes it: "legal personality of private law, developing service of public interest, by delegation of the Public Power, without any functional or hierarchical link with the agencies of public administration." (art. 3 of the Resolution of the Federal Medical Council, n. 1.541/98, which defines the Statute of the same Council).

c. See. p. 3 FCM Opinion n. 36/2002.

A "socially engaged" technological system

The connection between Point and Nucleus, aimed primarily at solving the clinical doubt that comes from the local professional, aims at the medium/long term the formation of a shared knowledge for cases of difficult interpretation, a knowledge whose management is the exclusive task of professionals of the health team, who must adapt it according to the characteristics of the territory and the health-disease conditions of the population. Therefore, if the primary objective of the Telehealth service is to solve the clinical doubt that gave rise to the request of the team doctor, the indirect objective is to favor the construction of a practical knowledge to solve the most difficult cases. For this reason each teleconsulting becomes an instrument of accumulation of medical knowledge, shared in "network" and accessible to the professionals of the Point.

The connection between Point and Nucleus, aimed primarily at solving the clinical doubt that comes from the local professional, aims at the medium/long term the formation of a shared knowledge for cases of difficult interpretation, a knowledge whose management is the exclusive task of professionals of the health team, who must adapt it according to the characteristics of the territory and the health-disease conditions of the population. Therefore, if the primary objective of the Telehealth service is to solve the clinical doubt that gave rise to the request of the team doctor, the indirect objective is to favor the construction of a practical knowledge to solve the most difficult cases. For this reason each teleconsulting becomes an instrument of accumulation of medical knowledge, shared in "network" and accessible to the professionals of the Point.

The territorial displacement of the system, in fact, in addition to pursuing objectives of geographical coverage, should be understood as an incorporation of knowledge on the part of the local health team, with the result that the network becomes an instrument for training of its daily activities. In this context, the clinical learning obtained by the health professionals who participate in teleconsulting activities is a specific objective of the network service and, therefore, it is measured according to the possibilities of action of the local health team and with the requirements of the territory. On the one hand, the teaching-learning dialectic, central to the horizontal vision adopted by UHS, reveals new research scenarios aimed at investigating modalities with which health-care professionals administer the different models of basic care versus specialized care; on the other hand, this dialectic recognizes the problematization of medical knowledge and, in particular, the collective character of the processes by which the diagnosis and the therapeutics are produced^{29,30,31}.

Therefore, the design, implementation and operation of Telehealth Networks assume a strong ethical-political connotation, while aimed at "social justice" purposes, aiming to give effect to the right to Health as a fundamental right of

each citizen. The interpenetration between the values and the structure of the service stands out even more clearly when comparing Telehealth with the notion of conventional telemedicine, that is, a "supplying" technological network, in which the main interaction is that which develops between a "patient as receiver" and a "professional as provider". Telehealth Networks, on the contrary, is characterized as a system of production-sharing and exchange of knowledge, in which the main interaction is that established between the "territory-community" and a "medical knowledge".

The configuration of the Networks appears, therefore, able to revert the perspective prevalent in the implementation of telemedicine models - the so-called "telemedicine rhetoric"^{10,11} - which promises to revolutionize the modalities of healing, virtually leading the patient to the specialized level, and thus, ensuring the execution of a wider range of specialized services.

Final Considerations

Health reform in Brazil prioritized the process of renewal of medical education, highlighting the defense of the population's health as an ethical-political commitment, within which the founding principles of the UHS constitute, from the outset, a mandatory reference point³². The ideological connotations of UHS permeate the service of Telehealth, addressing its activities to the enhancement of the level of basic health care, which has a dual function: that of joining the patient in the UHS and that of providing Basic Health Care services the population. Telehealth is characterized as a complex of people, devices and practices for health care, in which the end user is not the patient, but the doctor. By prohibiting any form of virtual meeting between doctor and patient, the UHS opted for the "non-transmission" of a knowledge of a relational nature, through ICT devices, eliminating at the root the debate related to the reductionist character of some telemedicine applications.

The operation of Telehealth Networks Brazil, therefore, demonstrates the viability of a care model based on the hygienic-social perspective of collective health, and distances itself from the paradigm of techno-medicine³³ committed to the search for a technological miracle^{34,35}. The activities of Telehealth Networks do not interfere in the process of co-construction of the pathology³⁶, but contribute to the qualification of the professionals of the local health teams. For this reason it can be affirmed that Telehealth produces an intervention that seems in harmony with the fundamental guidelines of the UHS, and that, therefore, can be defined as effective.

References

1. Mol A, Law J. Regions, Networks and Fluids: Anaemia and Social Topology. *Soc Stud Sci.* 1994 Nov [access in date unknow];24(4):641-71. Available on:

- <https://www.ncbi.nlm.nih.gov/pubmed/11639423>
DOI: 10.1177/030631279402400402 In: Pubmed;
PMID: 11639423
2. Grint K, Woolgar S. *The Machine at Work: Technology, Work and Organization*. 1ª edition. Cambridge: Polity Press;1997.
 3. MacKenzie D, Wajcman J. *The Social Shaping of Technology*. 2ª edition. Buckingham, Philadelphia: Open University Press; 1999.
 4. Latour B. *Pandora's Hope: Essays on the Reality of Science Studies*. 1 edition. Boston, MA: Harvard University Press; 2000.
 5. Suchman L, Blomberg J, Orr J, Trigg R. Reconstructing technologies as social practice. *American Behavioural Scientist*. 1999 Nov 01;43(3):392-408.
 6. Berger PL, Luckmann T. *The Social Construction of Reality*. London: Penguin Books; 1967.
 7. Whitten P, Sypher BD, Patterson JD. Transcending the Technology of Telemedicine: An Analysis of Telemedicine in North Carolina. *Health Communication*. 2000 Feb;12(2):109-35.
 8. May C, Ellis NT. When protocols fail: technical evaluation, biomedical knowledge and the social production of facts about a telemedicine clinic. *Soc Sci Med*. 2001 Oct [access in date unknow];53(8):989-1002. Available on: <https://www.ncbi.nlm.nih.gov/pubmed/11556780> In: Pubmed; PMID: 11556780
 9. Finch T, May C, Mair F, Mort M, Gask L. Integrating service development with evaluation in telehealthcare: an ethnographic study. *BMJ*. 2003 Nov;327(7425):1205-9.
 10. May C, Gask L, Atkinson T, Ellis N, Mair F, Esmail A. Resisting and promoting new technologies in clinical practice: The case of telepsychiatry. *Soc Sci Med*. 2001 Jun [access in date unknow];52(12):1889-901. Available on: <https://www.ncbi.nlm.nih.gov/pubmed/11352414> In: Pubmed; PMID: 11352414
 11. Zuiderent T, Berg M, Winthereik BR. Talking about distributed communication and medicine: on bringing together remote and local actors. *Human-Computer Interaction*. 2003 Jun;18(1):171-81.
 12. Curry R, Lethbridge K, Plant L. "Telemedicina nel Regno Unito", *E-Health care: innovazione e tecnologia in sanità*. 2011;3(13):68-73.
 13. Klein HK, Kleinman DL. *The Social Construction of Technology: Structural Considerations*. Science, Technology, & Human Values. 2002 Winter;27(1):28-52.
 14. Mort M, May C, Finch T, Mair F. Telemedicine and clinical governance: controlling technology, containing knowledge. In Gray A, Harrison S (eds). *Governing Medicine: Theory and Practice and Prospects*. London: Open University Press; 2004. pp. 107-21.
 15. Faulkner A. *Medical Technology into healthcare and society: a sociology of devices, innovation, and governance*. 1ª edition. London: Palgrave MacMillan UK; 2009.
 16. Conrad P. The shifting engines of medicalization. *J Health Soc Behav*. 2005 Mar [access in date unknow];46(1):3-14. Available on: <https://www.ncbi.nlm.nih.gov/pubmed/15869117> DOI: 10.1177/002214650504600102 In: Pubmed; PMID: 15869117
 17. Luz MT. Notas sobre as políticas de saúde no Brasil de "transição democrática" - anos 80. *Physis*. 1991;1(1):77-96.
 18. Ferraz F, Vendruscolo C, Kleba ME, do Prado ML, Reibnitz KS. Ações estruturantes interministeriais para reorientação da Atenção Básica em Saúde: convergência entre educação e humanização. *O Mundo da Saúde*. 2012;36(3):482-93.
 19. Iwaya LH, Gomes MA, Simplício MA, Carvalho TC, Dominicini CK, Sakuragui R R, Rebelo MS, Gutierrez MA, Näslund M, Håkansson P. Mobile health in emerging countries: a survey of research initiatives in Brazil. *Int J Med Inform*. 2013 May [access in date unknow];82(5):283-98. Available on: <https://www.ncbi.nlm.nih.gov/pubmed/23410658> DOI: 10.1016/j.ijmedinf.2013.01.003. Epub 2013 Feb 12. In: Pubmed; PMID: 23410658
 20. Ministério da Saúde (BR). *HumanizaSUS. A Humanização como Eixo Norteador das Práticas de Atenção e Gestão em Todas as Instâncias do SUS*. Brasília: Ministério da Saúde, 2004.
 21. Ministério da Saúde (BR). *Pólos de Educação Permanente em Saúde: Política de Educação e Desenvolvimento para o SUS*. Brasília: Ministério da Saúde, 2004.

22. Machado FSN, Pinto de Carvalho MA, Mataresi A, Mendonça AT, Cardoso LM, Yogi MS, Rigato HM, Salazar M. Utilização da telemedicina como estratégia de promoção de saúde em comunidades ribeirinhas da Amazônia: experiência de trabalho interdisciplinar, integrando as diretrizes do SUS. *Ciênc Saúde Coletiva*. 2010;15(1):247-54.
23. Paim J, Travassos C, Almeida C, Bahia L, Macinko J. The Brazilian health system: history, advances, and challenges. *Lancet*. 2011 May 21 [access in date unknow];377(9779):1778-97. DOI: 10.1016/S0140-6736(11)60054-8. Available on: <https://www.ncbi.nlm.nih.gov/pubmed/21561655> Epub 2011 May 9. In: Pubmed; PMID: 21561655
24. Piola SF, Vianna SM, Marinho A, Carvalho D, Ribeiro JA, da Silva JR. Saúde no Brasil: algumas questões sobre o Sistema Único de Saúde. Brasília: Cepal. 2009
25. Solla J, Chioro A. Atenção ambulatorial especializada. In Giovanella L, Escorel S, Lobato LVC, Noronha JC, Carvalho AI (Org.). Políticas e sistema de saúde no Brasil. Rio de Janeiro: Fiocruz; 2008. pp. 336-337.
26. Silva AB, Moraes IHS. O caso da Rede Universitária de Telemedicina: análise da entrada da telessaúde na agenda política brasileira. *Physis*. 2012;22(3):1211-35.
27. Rezende EJC, Melo MCB, Tavares EC, Santos AF, Souza C. Ética e telessaúde: reflexões para uma prática segura. *Rev Panam Salud Publica*. 2010;28(1):58-65.
28. Ministério da Saúde (BR). Manual de Telessaúde para Atenção Básica. Atenção Primária à Saúde. Brasília: Ministério da Saúde, 2012.
29. Cicourel AV. The Integration of Distributed Knowledge in Collaborative Medical Diagnosis. In Galegher J, Kraut RE, Egido C (eds). *Intellectual Teamwork. Social and Technological Foundations of Co-operative Work*. New Jersey: Lawrence Erlbaum Associates; 1990. p. 552
30. Atkinson P. *Medical talk and medical work*. 1 edition. London: Sage Publications (CA); 1995.
31. Rjani R, Perry M. The reality of medical work: The case for a new perspective on telemedicine. *Virtual Reality*. 1999 December;4(4):243-9
32. Feuerwerker L. Educação na saúde – educação dos profissionais de saúde – um campo de saber e de práticas sociais em construção. *Rev Bras Educ Méd*. 2007 Jab/Apr;31(1):3-4.
33. Pickstone J. *Ways of Knowing: A New Science of Technology, Technology and Medicine*. 1ª edition. Manchester: Manchester University Press; 2000.
34. Knight N, (1986). The New Light: X-rays and Medical Futurism. In Corn JJ, (eds). *Imagining Tomorrow: history, technology, and the American future*. Cambridge, MA: MIT Press; 1986. p.10-30.
35. Blume S. The Rhetoric and Counter Rhetoric of a "Bionic" Technology. *Science, Technology and Human Values*. 1997 Winter;22(1):31-56.
36. Richards T, Montori MV, Godlee F, Lapsley P, Paul D. Let the patient revolution begin. Patients can improve healthcare: it's time to take partnership seriously. *BMJ*. 2013 May 14 [access in date unknow];346:f2614. Available on: <https://www.ncbi.nlm.nih.gov/pubmed/23674136> DOI: 10.1136/bmj.f2614. In: Pubmed; PMID: 23674136

Indication of responsibility: All authors participated in all phases of the article.

Financing: Own incentive.

Conflict of interest: The authors declare that there is no conflict of interest.

How to cite this article: Botrugno C, Goldim JR, Fernandes MS. The telehealth Brasil networks: A "socially engaged" technological system. *Latin Am J telehealth*, Belo Horizonte, 2019; 6 (1): 044 - 050. ISSN: 2175_2990.