

# A look at the Telehealth in Brazil from the ICT in Health 2014 survey



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Abstract

*This article aims to present the main results of the latest edition of the survey on the use of information and communication technologies in brazilian health institutions - ICT in health 2014, with the more specific focus on the indicators that allow to outline a use scenario of the telehealth in Brazil. The ICT in health survey aims to investigate the availability of ICT-based applications in health institutions, as well as the use that is made of these applications by doctors and nurses in providing assistance to the population. The results point to an increasing use of ICT in health institutions, as well as evindence that a large part of professionals have home access almost universalized to these technologies. On the other hand, the research shows a limited use of telehealth strategies, especially for asynchronous interaction activities. Public healthcare facilities stand out in conducting research strategies and distance education, while private healthcare establishments stand out in the still incipient use of patient monitoring activities at distance.*

**Keywords:** Information and Communication Technology; Health Informatics; Telehealth.

Resumen

**Resumen:** Una mirada a la telesalud en Brasil desde la investigación TIC Salud 2014

*El objetivo de este artículo es presentar los principales resultados de la última edición de la investigación sobre el uso de tecnologías de la información y comunicación en los centros de salud de Brasil - TIC Salud 2014, centrándose más específicamente en los indicadores para trazar un escenario de uso de telesalud en Brasil. La investigación TIC Salud tiene por objeto estudiar la disponibilidad de las aplicaciones basadas en las TIC en los establecimientos de salud, y el uso de estas aplicaciones por parte de los médicos y enfermeros en la prestación de asistencia a la población. Los resultados apuntan a un creciente uso de las TIC en los establecimientos de salud, así como evidencian que la mayoría de los profesionales del área tienen acceso domiciliario casi universal a estas tecnologías. Por otro lado, la investigación apunta el uso todavía limitado de las estrategias de telesalud, especialmente las actividades de interacción asíncrona. Los establecimientos públicos de salud se destacan en la realización de las estrategias de investigación y educación a distancia, mientras que los establecimientos privados se destacan en el uso todavía incipiente de actividades de monitoreo de pacientes a distancia.*

**Palabras clave:** Tecnología de la Información y Comunicación; Informática en Salud; Telesalud.

### Um olhar sobre a telessaúde no Brasil a partir da pesquisa TIC Saúde 2014

*O presente artigo tem como objetivo apresentar os principais resultados da edição mais recente da pesquisa sobre o uso das tecnologias de informação e comunicação nos estabelecimentos de saúde brasileiros - TIC Saúde 2014, tendo como foco mais específico os indicadores que permitem traçar um cenário do uso da telessaúde no Brasil. A pesquisa TIC Saúde tem por objetivo investigar a disponibilidade de aplicações baseadas em TIC nos estabelecimentos de saúde, bem como o uso que é feito dessas aplicações por médicos e enfermeiros na prestação da assistência à população. Os resultados apontam para um crescente uso de TIC nos estabelecimentos de saúde, assim como evidenciam que grande parte dos profissionais da área tem acesso domiciliar quase universalizado a estas tecnologias. Por outro lado, a pesquisa aponta um uso ainda limitado das estratégias de telessaúde, com destaque para atividades de interação assíncrona. Estabelecimentos públicos de saúde destacam-se na realização de estratégias de pesquisa e educação a distância, enquanto estabelecimentos privados destacam-se no ainda incipiente uso de atividades de monitoramento de pacientes a distância.*

**Palavras-chave:** Tecnologia da Informação e Comunicação; Informática em Saúde; Telessaúde.

## INTRODUCTION

This article aims to present the main results of the latest edition of the ICT in Health survey, for the year 2014, with the more specific focus on the indicators that allow to outline a scenario of telehealth in Brazil.

The ICT in health survey<sup>1</sup> is conducted annually by the Regional Centre of Studies for the Development of the Information Society (Cetic.br) since 2013. Its aim is to map the technological infrastructure of Brazilian health institutions and the adoption of solutions and applications of the information and communication technology (ICT) in health. Thus, it is part of the study to investigate the availability of ICT-based applications in health institutions, as well as the use that is made of these applications by doctors and nurses in providing assistance to the population. The historical series of the survey, which began in 2013, provides a set of data which enable both the conduct of academic studies on the subject, and the production of relevant indicators for the formulation and evaluation of national public policies in health.

The use applications of the ICT in health vary according to the intent and availability, considering the principles of security, privacy and confidentiality of health data, ensuring access, but preserving the identity of citizens. The trends range from the use of customized mobile applications to implanted or wearable sensors to humanoid robots that can accompany the elderly and those with chronic diseases.

It is worth noting that the World Health Organization (WHO) defines the term e-health or telehealth as the safe use, with cost-effectiveness of the resources based on ICT and in related areas, including service delivery, supervisory researches, health literature, education, knowledge and research. Still, in a broader way, the term implies the development of a new way of working, of attitude and a commitment to increase the exchange of data and improve the local, regional and global health service, using ICT. (Further informa-

tion in: <http://www.who.int/tb/areas-of-work/digital-health/definitions/en/>. Accessed on June 4th, 2016).

However, regular assessments need to be performed and analyzed for the use to be effective and the investment justified in the health sector. Therefore, indicators need to be created and shared - nationally and internationally - enabling the development of public policies are based on evidence. Therefore, studies such as ICT in health that seek to identify the use and establish systematic measurements on a particular theme over time, may contribute to the implementation of new strategies in the health area.

## METHOD

The ICT in health survey has as target population the Brazilian healthcare facilities that are registered in the National Register of Brazilian Healthcare Facilities (CNES) of the Informatics Department of SUS (DATASUS). These healthcare facilities, public and private ones must have their own National Register of Legal Entity (CNPJ) or from a maintenance entity, besides physical facilities intended exclusively for actions in the health area, counting on the action of at least a doctor or a nurse.

The healthcare facilities were selected by proportional sample to the size, taking into account the square root of the number of professionals of each organization. For the selection of professionals, a list of hired doctors and nurses or who work in local departments was requested to the administrative sector of the establishments selected in the sample.

The data collection was conducted through telephone interviews based on two structured questionnaires: one applied for the administrative managers of the establishments (preferably managers of information technology area - IT) and the other for the health professionals (doctors and nurses).

In the edition of 2014, it was interviewed 2,121 managers, 1,067 doctors and 2,037 nurses, between September 2014 and March 2015.

## RESULTS

Although the scope of the ICT in Health survey is more comprehensive - covering topics such as the use of Electronic Health Record (EHR) and the exchange of health information -, we will treat this article only on aspects linked to the telehealth agenda. To contextualize the current situation in the country of ICT use in healthcare facilities, it will also be presented the data on the ICT infrastructure, a key aspect in order to be possible telehealth strategies.

### Infrastructure

In 2014, it was found that the availability of basic ICT infrastructure has advanced in Brazilian healthcare facilities in relation to 2013: 92% of them used a computer in the last 12 months, while 85% used the Internet. In the earlier survey (2013), these percentages were 83% and 77%, respectively.

In this same period, the availability of ICT infrastructure among Brazilian public healthcare facilities: in 2013, 68% of them used the computer in the 12 months prior to the study and, in 2014, this proportion reached 85%. In the case of the private sector, 99% of the establishments use computers - maintaining stability in relation to 2013.

In 2014, 85% of the total of interviewed institutions reported having an Internet connection. From the establishments studied, it was found that the Internet is present in all of those with hospitalization and more than 50 beds and those supporting services of diagnosis and therapy (SADT). However, in smaller establishments inpatient (up to 50 beds) and those ones outpatient, the Internet usage is, respectively, 91% and 81%.

The type of Internet connection is a criterion that helps in further evaluation of the technological infrastructure available in the establishments. The survey showed that 94% of the establishments have fixed broadband, but 59% use more robust connection types, such as via cable or optical fiber. The penetration of mobile broadband is 19% of all health institutions with internet. Another important factor to evaluate the Internet usability is the connection speed. Note that 15% of the establishments claim to have connection with speeds above 10 Mbps. However, for this indicator,

there is a high proportion of respondents (30%) who say they do not know to inform the connection speed.

In private healthcare facilities, 70% of those with Internet access have some kind of electronic record on health while in public ones this proportion is 31%. This information helps to dimension the challenges to the implementation of the National Health Card, the Ministry of Health project that seeks to identify the users and link them to the procedures carried out under the Unified Health System (SUS), which depends on the construction of a national register of users, professionals and health units. Further information about the Social Security Card available at: <<http://portalsaude.saude.gov.br/index.php/o-ministerio/principal/secretarias/sgep/cartao-nacional-de-saude>>. Access on: 10 July 2015).

From the healthcare facilities that have used Internet in the last 12 months, 43% have fixed access points to the electronic records distributed by the establishment, with higher proportions among the ones of hospitalization with more than 50 beds (65%) and those in support of diagnosis and therapy (64%).

The internal network which can be accessed from a laptop, tablet or mobile phone is available in 35% of the establishments. It is interesting to note that 19% reported having access to the record outside the establishment (through the Internet) - which requires that the safety rules, privacy and confidentiality of health information are being strictly followed.

The second edition of ICT in health survey began to investigate the information security theme in a more depth way. As a first observation, it was found that 35% of healthcare facilities with internet access claim to have a document or manual describing the internal policy of information security. This type of document is essential that all actors involved in the service can be clearly informed and committed to the safety aspects and privacy of patient information to which they have authorized access. This proportion is higher in the establishments of support service to diagnosis and therapy and in those with more than 50 inpatient beds.

Finally, it should be emphasized that the practice of performing backup copies of stored information (backup), is held by 77% of healthcare facilities with Internet access, and 51% do it daily. Among the types of information security tool used by the establishments, with particular attention to the use of antivirus (93% of establishments with Internet access), the access limitation to certain websites (73%), the restriction for application

installation (73 %) and the protection by password to the electronic system (71%).

### Online services offered to the patient and telehealth

After observing the overall situation of access infrastructure and the availability of ICT-based applications in the healthcare facilities of the country, it is important to analyse how they relate to patients and services offered by the Internet. This means checking how technology has been used to simplify the interaction of patients with the health care system and its providers.

Regarding the interaction of these establishments with the company, it was observed that 27% of those with Internet access have a website, especially inpatient and larger size establishments (62%) and the private ones (42%). It is also worth adding that 23% of the establishments have account or profile on social networks, most of them on Facebook.

In relation to the services offered by the Internet, it was observed that 20% offer to the patient the visualization of the medical examination results through the Internet. The service appears more frequently (52%) among the establishments of support to diagnosis and therapy. The scheduling of medical examinations (13%) and consultations (11%) through the Internet are services offered by a small proportion of the Brazilian healthcare facilities in Brazil, as well as the viewing of medical records by the patient (3%).

In general, in several countries worldwide, the telehealth has gained increasing importance in all health sectors, from consulting, monitoring and interpretation of medical examinations to attendance service in homecare and intensive care, going through telepresence with the use of robots<sup>2</sup>.

However, the ICT in health survey showed that, in Brazil, the distance remote monitoring of patients is still little widespread: it is present in 8% of healthcare facilities with internet.

One of the first modalities reported in the literature and still used in health practice is the exchange of electronic messages of health professionals with their peers or with patients. Such asynchronous interactions are relevant, even considering the existing risks, such as not receiving assurance, security issues and challenges for the integration with the data registered in medical records. In this research, it was observed that 66% of healthcare facilities that have used Internet provide some type of interaction that does not occur in real time, such as email.

Regarding the interaction in real time, such as by teleconference, it is available in 30% of the establishments. The

research shows that 31% have equipments for teleconferencing. Of these, 86% use the equipments for education and training. It is interesting to observe that about half of these establishments use the teleconferencing tools to conduct interaction between doctors and nurses, either from the same establishment or from different ones.

Distance learning is available in 27% of the establishments and the distance research activities in 20%. In both activities, the public healthcare facilities have higher proportions than the private ones (Figure 1). The largest proportion of public healthcare facilities in this regard is very related to programs such as the Telemedicine University Network (RUTE), which aims to support projects in telemedicine, with over 100 operating cores distributed throughout the country. Further information about the Rute Network is available at: <<http://rute.rnp.br>>. Access on: 10 July 2015.

Another program to be highlighted is the National Telehealth Program Applied to Primary Care (Telehealth Brazil Networks), under the Ministry of Health. It was created in 2007, and it aims to improve the quality of care and optimize the use of SUS resources that refers to primary care through the Telecare and Tele-education. Further information about the Telehealth Brazil Networks is available at: <<http://programa.telessaudebrasil.org.br>>. Access on: 10 July 2015.

The ICT in health survey in 2014 showed that 21% of the establishments with Internet participate in any network telehealth.

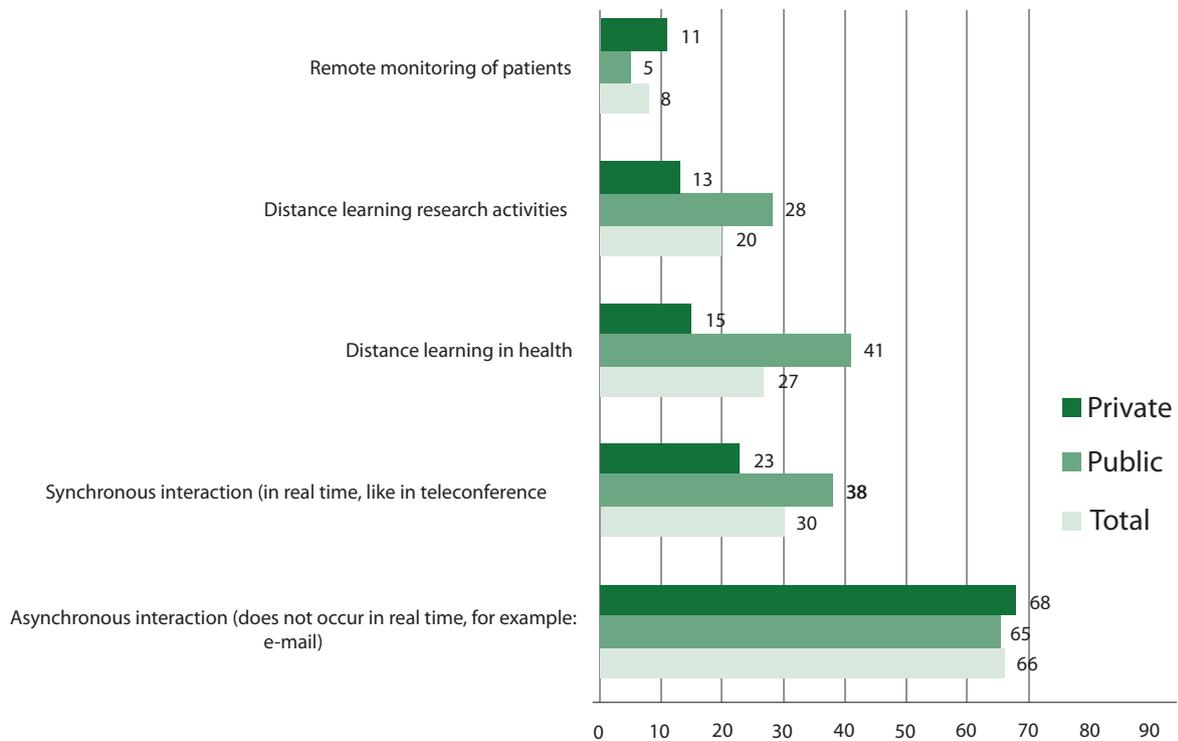


Figure 1: Percentage on the total of healthcare facilities that have been using the Internet in the last 12 months

### Investigating the uses of telehealth by health professionals

Besides the availability of infrastructure and electronic services within the establishments, the ICT in health survey allowed to observe the challenges for the appropriation of these applications by the professionals of the area, especially doctors and nurses. The capabilities and skills of these professionals in the use of ICT are fundamental to the dissemination of tools that help the delivery of health services.

The home access to computers and the Internet is practically universalised among health professionals: 98% of doctors have access to a computer and 99% to the Internet at home; 99% of nurses have computer at home and 98% Internet access.

The individual Internet use is also reported by almost all the professionals - 98% of doctors and 99% of nurses reported using the network in the past three months. Among the doctors, 93% use the Internet daily. The greater use occurred among younger doctors (96% among those aged up to 35 years old, while the same indicator is 87% among the 51 years old or more) and among those in the Southeast (97%). Among the nurses, the proportion of daily use is 88%, also with greater use among younger people (93% among those under 30).

In addition to the home access and individual use, the frequency of computer use and Internet within the health institutions is an important finding, as it indicates a greater degree of ownership of ICT professionals in the workplace. The nurses report increased availability of access to ICT in the health care than the doctors: 80% of nurses and 65% of doctors have access to the device on the desktop. This reinforces a paradigm established since the beginning of the development of the knowledge area of Informatics in health, when it said the nurses would be the primary users of ICT in health, because they are closer and more time with the patient<sup>3</sup>.

It is worth mentioning that there are differences in this availability in regional terms, related to the administrative level and to the type of establishment: in the private sector, 95% of nurses have the equipment, while in the public sector 72% have access to the device. In the establishments inpatient and larger facilities (more than 50 beds) 89% of nurses have computers available and 72% in those outpatient establishments. In the Southeast, 88% of nurses have computer in the establishment while in the North this percentage is 65%.

Among the doctors, 86% have computer access in private establishments (in the public sector, 55%). Regionally, 83% of doctors from the south had computer

availability at work comparing with 49% of interviewed in the northeast.

With regard to Internet access available in the health-care facilities, to be accessed by desktop, laptop, tablet or mobile phone, there was also a higher proportion of nurses with access (80%) compared to the doctors (71%). The proportion of nurses with Internet access at work reaches 86% in the establishments with more than 50 hospital inpatient beds with internet access; in outpatient establishments is 76%. The proportion of doctors in the establishments with more than 50 beds is 81%, while in the ones without hospitalization is 55%.

Regarding the telehealth services for professionals, distance learning is referenced by 26% of doctors with access to a computer in the healthcare facilities (of which 32% have this type of service available) and 24% of nurses also with access to computer (it is available to 30%). The percentage of workers were added using the “Daily” functionality, “At least once a week”, “At least once a month” and “less than once a month.”)

Since the real-time interaction such as the teleconferencing, it is used by 16% of doctors (and which is available for the use of 22% of professionals) and 12% of the nurses (available to 20%). The remote monitoring of patient is a feature used by only 4% of health professionals.

In the case of telehealth, there is a distance slightly larger between the use and availability of the features in the establishment when compared to other features measured by the survey.

## CONCLUSION

The ICT in Health survey allowed to verify that there are still challenges to universalize the basic infrastructure of computers and the Internet in healthcare facilities in the country - especially those responsible for primary care, outpatient and the public network.

Although the use of ICT by the health professionals, the individual use and the home access are practically universalized, the use in the workplace has low levels, as a reasonable share of professionals, especially doctors, has no computer and Internet available in the healthcare facilities.

All over the world, the discussion on the way subsequently in the healthcare area gain increasing relevance for the expansion of the technological infrastructure available and computer solutions. The current industry demands also require that health professionals are prepared to lead and manage the new settings of care that arise and begin to consolidate. New roles, new labor and business models are emerging, im-

posing actions and more collaborative actions that can only be performed if the technological resources are effectively appropriated by these professionals<sup>4</sup>.

## ACKNOWLEDGMENT

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