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EXECUTIVE SUMMARY

—

ICT IN HEALTH SURVEY

2019

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Brazilian Internet
Steering Committee

Executive Summary
ICT in Health 2019

The ICT in Health survey investigates the access and use of information and communication technologies (ICT) in Brazilian healthcare facilities and their use by physicians and nurses. In this seventh edition, carried out in the period immediately before the dissemination of the COVID-19 pandemic in Brazil, the results outline the digital health in the country and the health system's readiness for this new context.

In terms of infrastructure, the availability of computers and Internet access in healthcare facilities has been increasing in recent years. In 2019, computer and Internet use was universal among private facilities, those located in capital cities, inpatient facilities with more than 50 beds and those that provided diagnosis and therapy services. The facilities with the lowest connectivity were public facilities (92% had computers and 85% had Internet access); and outpatient facilities and those located in non-capital cities (95% had computers and about 90% had Internet access). Regional differences were also observed, as shown in Figure 1.

Among facilities with Internet access, the most common connections used were cable or fiber optic connections, reaching 86% of healthcare facilities in 2019. Connection via telephone lines (DSL) has gradually fallen in recent years, but was still used by 43% of the facilities. Connection via radio and satellite was present in 13% and 8% of facilities, respectively, and was more common in the North and Center-West regions.

The range of download speed of the main connection in healthcare facilities has been growing in recent years – a trend also observed in other Cetic.br/NIC.br surveys. Connections faster than 100 Mbps grew from 4% in 2018 to 11% of facilities in 2019. It is worth noting that differences in access to speeds greater than 10 Mbps occurred mainly among public (20%) and private (60%) facilities, and outpatient facilities (38%) and inpatient facilities with more than 50 beds (75%). These results show the persistence of disparities in access, especially among public facilities.

Patient information in electronic format

The use of electronic systems to record patient information is important to integrate patient care and improve the quality and effectiveness of the health system. During a pandemic, quick access to sound patient information makes it possible to monitor those in high-risk groups and aggregate data to make decisions about public health. The results for 2019 showed progress, with the presence of these systems in 82% of facilities, compared to 2018, when this percentage was 73%. Public facilities, inpatient facilities with up to 50 beds, and those in the North and Northeast region presented the lowest proportions of electronic systems, as shown in Chart 1.

IT GOVERNANCE AND INFORMATION SECURITY

Regarding information technology (IT) management and governance, in 65% of public facilities, computer technical support was performed by service providers hired by municipal health departments, while 69% of private facilities used service providers hired by the facility itself. Inpatient facilities with more than 50 beds were the only ones in which the majority (67%) had an in-house team for this service.

Regarding information security, biometric-protected access to electronic systems presented the greatest positive variation compared to the previous edition (from 8% to 16%). Inpatient facilities (more than 50 beds) and facilities that provided diagnosis and therapy services presented the best results in terms of the adoption of security tools (Chart 2). In the present edition, two new tools were included: data loss protection/prevention (DLP), present in 22% of healthcare facilities; and two-factor authentication, installed in 7% of facilities. These tools help strengthen security against information leaks: The first monitors events and system vulnerabilities; the second restricts access by unauthorized persons.

> ABOUT A QUARTER OF THE FACILITIES OFFERED SERVICES FOR BOOKING APPOINTMENTS AND TESTS AND VIEWING LAB TEST RESULTS ON THE INTERNET

PATIENT DATA IN ELECTRONIC FORMAT

In 2019, there was an increase in the availability of patient information in electronic format. The main advances in comparison with 2018 were patient demographics (89% vs. 79%); the main reasons that led patients to medical services or appointments (64% vs. 50%); and admission, referral and discharge (56% vs. 33%).

As for the functionalities of electronic systems, emphasis goes to the increase in their availability in public facilities in recent years, mainly: listing lab test results for a specific patient (from 17% in 2016 to 41% in 2019); listing patients on a specific medication (from 18% in 2016 to 40% in 2019); and writing medical prescriptions (29% to 51%). These increases may point to evolution in the level and complexity of the electronic systems adopted.

ONLINE PRESENCE AND TELEHEALTH

In the current health crisis, both virtual communication and health services have played an important role in meeting recommendations for social isolation and coping with the pandemic. In 2019, private facilities (50%), inpatient facilities with more than 50 beds (51%), and those that provide diagnosis and therapy services (48%) had both websites and social network profiles. However, more than half of public facilities (57%), about four out of ten outpatient facilities (39%), and inpatient facilities with up to 50 beds (44%) did not have websites or social network profiles.

Online services were more commonly provided by private facilities than public facilities. Booking tests (39%) and viewing lab test results (60%) on the Internet were most commonly provided by facilities that provided diagnosis and therapy services.

Regarding telehealth services, the survey investigated facilities that were authorized in the pre-pandemic period, and, as has been the case throughout the historical survey series, public facilities presented greater availability of these services. The main services provided were distance learning in health care, teleconsulting services, and distance research activities.

ICT ADOPTION IN PRIMARY HEALTHCARE UNITS

In this edition, the results for primary healthcare units (PHUs) are especially noteworthy, as they represent the point of

FIGURE 1

USE OF COMPUTERS AND THE INTERNET IN THE LAST 12 MONTHS (2019)

Total number of healthcare facilities (%)

North
Northeast
Center-West
South
Southeast

Computers
Internet

92
82

90
83

98
96

99
98

98
97
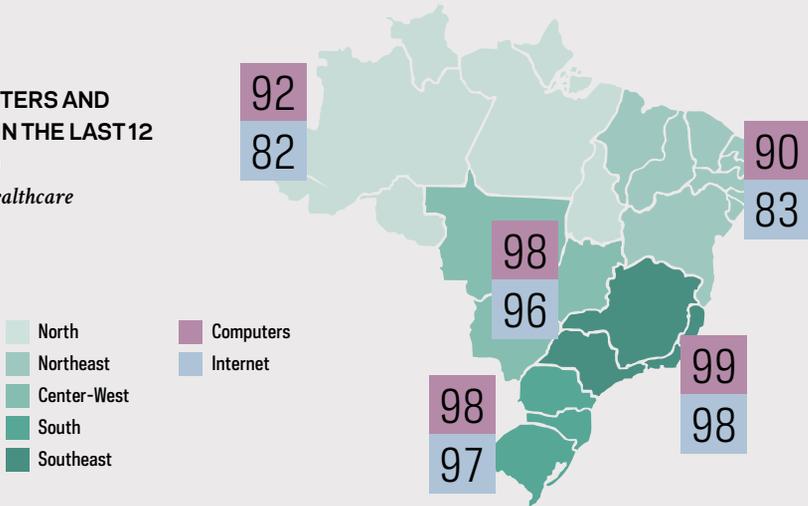
CHART 1

AVAILABILITY OF AN ELECTRONIC SYSTEM TO RECORD PATIENT INFORMATION (2019)

Total number of healthcare facilities that used the Internet in the last 12 months (%)

Total — 82
Public — 74
Private — 88
North — 74
Northeast — 77
Southeast — 83
South — 90
Center-West — 78
PHU — 78
Outpatient — 81
Inpatient (up to 50 beds) — 67
Inpatient (more than 50 beds) — 91
Diagnosis and therapy services — 91
Capital city — 92
Non-capital city — 79

ADMINISTRATIVE JURISDICTION
REGION
TYPE OF FACILITY
LOCATION

CHART 2

TYPE OF INFORMATION SECURITY TOOL USED (2019)

Total number of healthcare facilities that used the Internet in the last 12 months (%)

Antivirus — 91 / 97 / 96
Password-protected access to electronic system — 77 / 91 / 83
Firewall — 52 / 87 / 60
Password protection in sent or received files — 48 / 50 / 55
Cryptography of files and e-mails — 41 / 55 / 50
Digital certificate — 38 / 52 / 57
Database cryptography — 36 / 50 / 43
Electronic signature — 34 / 41 / 57
Data loss protection/prevention - DLP — 22 / 23 / 29
Biometrics-protected access to the electronic system — 16 / 12 / 17
Two-factor authentication — 7 / 16 / 13

Total
Inpatient (more than 50 beds)
Diagnosis and therapy services

entry to the Brazilian Unified Health System (SUS) and play an essential role in monitoring the local population's health and in disease prevention. The 2019 results showed that 91% of these units had computers and 82% had Internet access, a result that remained stable in relation to 2018. However, there was improvement in relation to the adoption of electronic systems to record patient information, with an increase from 69% in 2018 to 78% in 2019.

How patient information is stored also varied considerably in relation to the previous year. These changes impacted the percentage of PHUs with patient data available electronically. In 2019, there was an increase in all the investigated items, as shown in Chart 4. These results may indicate a transition trend in PHUs toward digital health strategies.

There were also positive variations in relation to the percentage of PHUs with electronic functionalities available in their systems. This increase occurred in administrative functionalities such as requesting lab tests and writing medical prescriptions.

Regarding the Internet presence of PHUs, 21% had websites and 20% had accounts or profiles on social networks. About a quarter provided online services to the population, such as booking appointments and tests and viewing lab test results (Chart 5).

A higher percentage had telehealth services, with 39% offering distance learning, 25%, telediagnosis, and 30% distance research activities.

ICT ACCESS AND USE BY HEALTHCARE PROFESSIONALS

The availability of computers and the Internet for professional use has remained stable in recent years. In 2019, among physicians, 88% had access

> 88% OF PHYSICIANS AND 94% OF NURSES CONSIDERED THAT THE USE OF ICT HAD IMPROVED THE EFFICIENCY OF TEAM WORK PROCESSES

to computers and 94% had Internet access in the facilities. It is worth highlighting that in public facilities, 23% of physicians and 14% of nurses did not have any computers available. Among physicians with computer access, 54% wrote medical prescriptions in electronic format, and 31% did so both manually and electronically. Nonetheless, 71% signed prescriptions by hand.

Of the telehealth tools investigated, distance learning was the most available to professionals (approximately 43% for both physicians and nurses). Distance research, teleconsulting and second formative opinions were available to at least one-quarter of professionals.

Regarding the perception of professionals about the impacts of ICT use, 83% of physicians considered that there was a reduction in medication administration errors, and also improvement in quality of treatment as a whole. Among nurses, 91% perceived greater efficiency of services, and 88%, improvement in patient care as a whole.

Methodology and access to data

In this edition, interviews were conducted with 2,427 managers, 1,732 physicians and 2,458 nurses who worked at selected healthcare facilities. Data collection was conducted by telephone interviews between July 2019 and February 2020. The results of the ICT in Health survey, including tables of total values and margins of error for each indicator are available on Cetic.br's website (http://www. cetic.br) and data visualization portal (http:// data. cetic.br/cetic). The methodological report and the data collection report can be accessed in both the printed publication and the website.

CHART 3

TELEHEALTH SERVICES AVAILABLE (2019)

Total number of healthcare facilities that used the Internet in the last 12 months (%)

	Public	Private
Distance learning in health	33	8
Teleconsulting services	28	3
Distance research activities	25	5
Telediagnostics services	20	5
Second formative opinion services	16	5
Remote patient monitoring	6	4

■ Public ■ Private

40,880
Total number of PHUs

3,581
PHUs with no computers

3,637
PHUs with no Internet access

7,270
PHUs with Internet access and with no electronic system

21%
PHUs with websites

20%
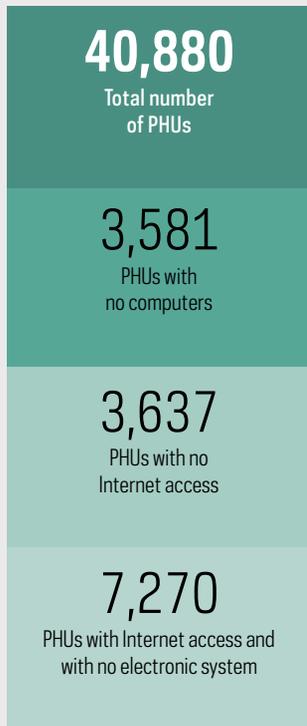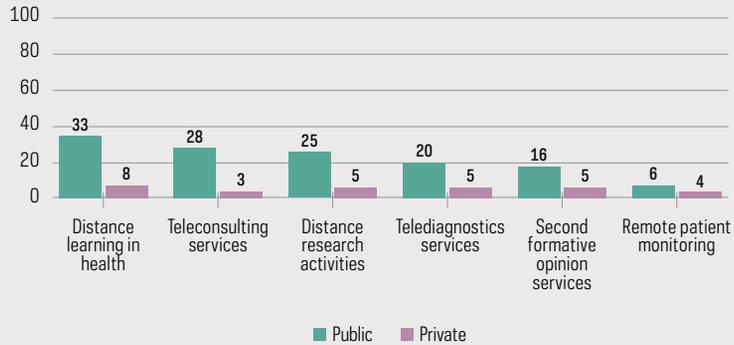PHUs with social network profiles

CHART 4

PHU BY TYPE OF PATIENT DATA ELECTRONICALLY AVAILABLE (2018 AND 2019)

Total number of healthcare facilities that used the Internet in the last 12 months (%)

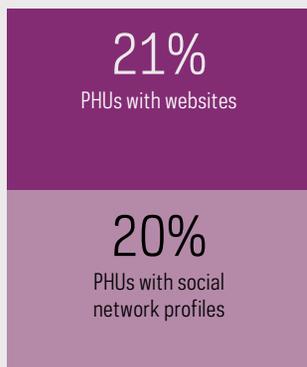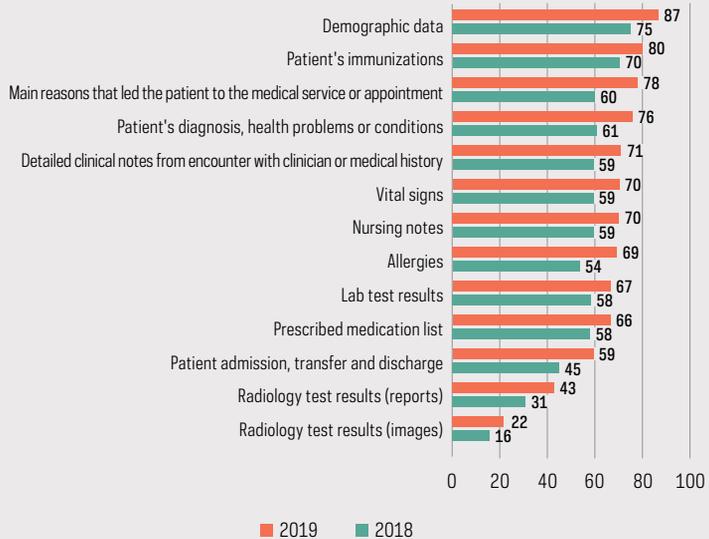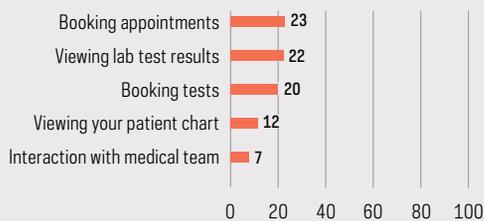|	2019	2018
Demographic data	87	75
Patient's immunizations	80	70
Main reasons that led the patient to the medical service or appointment	78	60
Patient's diagnosis, health problems or conditions	76	61
Detailed clinical notes from encounter with clinician or medical history	71	59
Vital signs	70	59
Nursing notes	70	59
Allergies	69	54
Lab test results	67	58
Prescribed medication list	66	58
Patient admission, transfer and discharge	59	45
Radiology test results (reports)	43	31
Radiology test results (images)	22	16

■ 2019 ■ 2018

CHART 5

PHU BY SERVICES OFFERED TO PATIENTS THROUGH THE INTERNET (2019)

Total number of healthcare facilities that used the Internet in the last 12 months (%)

Booking appointments	23
Viewing lab test results	22
Booking tests	20
Viewing your patient chart	12
Interaction with medical team	7

ABOUT CETIC.br

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The Regional Center for Studies on the Development of the Information Society, a department of NIC.br, is responsible for producing indicators and statistics on the access and use of the Internet in Brazil, disseminating analyzes and periodic information on the Internet development in the country. Cetic.br is a Regional Study Center, under the auspices of UNESCO. More information at http://www.cetic.br/.

ABOUT NIC.br

nic.br

The Brazilian Network Information Center – NIC.br (http://www.nic.br/) is a non-profit civil entity, which in addition to implementing the decisions and projects of the Brazilian Internet Steering Committee, has among its attributions: coordinate the registration of domain names – Registro.br (http://www.registro.br/), study, address and handle security incidents in Brazil – CERT.br (http://www.cert.br/), study and research network technologies and operations – CEPTRO.br (http://www.ceptro.br/), produce indicators on information and communication technologies – Cetic.br (http://www.cetic.br/), implement and operate Internet Exchange Points – IX.br (http://ix.br/), enable the participation of the Brazilian community in the global development of the Web and support the formulation of public policies – Ceweb.br (http://www.ceweb.br), and host the Brazilian W3C office (http://www.w3c.br/).

ABOUT CGI.br

cgi.br

The Brazilian Internet Steering Committee, responsible for establishing strategic guidelines related to the use and development of the Internet in Brazil, coordinates and integrates all Internet service initiatives in the country, promoting technical quality, innovation and dissemination of the services offered. Based on the principles of multistakeholderism and transparency, CGI.br represents a democratic Internet governance model, internationally praised, in which all sectors of society participate equitable in the decision-making. One of its formulations is the 10 Principles for the Governance and Use of the Internet in Brazil (http://www.cgi.br/principios). More information at http://www.cgi.br/.

Access complete data from the survey

The full publication and survey results are available on the **Cetic.br** website, including the tables of proportions, totals and margins of error.

ACCESS
WWW.CETIC.BR