**METHODOLOGICAL REPORT**

PRIVACY AND PERSONAL DATA PROTECTION

**Methodological Report**

**Privacy and Personal Data Protection 2021**

he Regional Center for Studies on the Development of the Information Society (Cetic.br), a department of the Brazilian Network Information Center (NIC.br), and affiliated with the Brazilian Internet Steering Committee (CGI.br), presents the methodological aspects of the publication *Privacy and personal data protection 2021: Perspectives of individuals, enterprises and public organizations in Brazil.* The objective of the project was to determine the current scenario and understand the main challenges to the

**T**

construction of a digital ecosystem that guarantees respect for privacy and protection of personal data in Brazil. The survey was based on the collection and processing of quantitative data from Brazilian society through surveys conducted regularly by Cetic.br|NIC.br. The information includes the perceptions of Internet users about their rights and the processing of their personal data. With regard to organizations, the publication presents a survey on how enterprises and government organizations are adapting to the topic of privacy and protection of personal data since the enactment of the Brazilian General Data Protection Law (LGPD).

The project had three specific objectives:

* To investigate the perceptions of the population of Internet users about the use and protection of their personal data;
* To understand how small, medium, and large enterprises process the personal data of their customers/consumers, as well as relevant issues associated with the implementation of the LGPD in Brazil;
* To establish an overview of data protection in the context of public policies, including the adoption of practices by government organizations, healthcare facilities, and schools.

In the next sections, we present the main methodological aspects of the surveys used to collect the indicators and provide the references for full access to the “Methodological Report” and the “Data Collection Report” of each survey used.

# ICT Panel – Internet users (2021)

The ICT Panel was created with the goal of collecting information on Internet use during the pandemic caused by the novel coronavirus. Carried out via web questionnaires, the survey was developed as an alternative to in-person data collection, which was affected by the social distancing measures implemented during this period. Since then, the panel’s methodology has been adopted to collect data on other topics relevant to the discussion about the digital transformation.

In 2021, a new module of the ICT Panel was developed to investigate the perceptions of the population of Internet users about the processing and protection of their personal data (CGI.br, 2021a). The creation of a specific questionnaire on privacy to be administered to Internet users was based on various previous studies with converging objectives. One of the first data collections used was Eurobarometer Special Survey No. 431 on personal data protection, carried out in 2015 and commissioned by the European Commission. Another relevant source was the June 2019 issue of the *American Trends Panel* by the Pew Research Center. Among official surveys produced by national statistical institutes, we included the *Survey of Canadians on Privacy-Related Issues*, carried out in 2020 by order of the Office of the Privacy Commissioner of Canada.

The second edition of the *ICT Panel COVID-19* survey conducted by Cetic.br|NIC.br was also considered, which included a module on privacy. This module was part of a regional effort led by the Inter-American Development Bank (IDB) with the aim of measuring attitudes and perceptions regarding the protection of personal data, considering the use of information and communication technologies (ICT) as part of measures to contain the pandemic (CGI.br, 2020).

The target population of the survey was composed of Internet users 16 years old or older in Brazil, who were defined as individuals who had used the Internet in the three months prior to the interview, according to the methodological recommendation of the International Telecommunication Union (ITU, 2020).

The survey’s sampling design was an online panel of individuals maintained by Quaest Consultoria e Pesquisa, with approximately 167,000 panelists. Quota sampling was used to obtain the sample of respondents, considering the following variables: sex, age group, level of education, macro-region, and social class. The survey data collection was carried out between November 12 and December 3, 2021; in all, 2,556 interviews were conducted.

To minimize the selection biases found in quota approaches, a weighting structure was created for the ICT Panel, based on the ICT Households 2020 survey**1**, a probabilistic survey. In the initial stage, the results of this survey were recalibrated for the population of the *Continuous National Household Sample Survey* (Continuous Pnad) (Brazilian Institute of Geography and Statistics [IBGE], n.d.), considering the last quarter released.

**1 More information available at the survey’s website:** [**https://www.cetic.br/en/pesquisa/domicilios/**](https://www.cetic.br/en/pesquisa/domicilios/)

Subsequently, the number of the population represented by the respondents of the ICT Panel was estimated based on propensity scores**2**. According to this methodology, first, the propensity scores of being an Internet user were calculated according to socioeconomic variables, based on the last edition available of the ICT Households survey**3**. Next, this same model was used to estimate the propensity scores for respondents of the ICT Panel.

On comparing the distribution of propensity scores of the ICT Panel with that verified in the last ICT Household survey, it was possible to determine which part of the population of the latter (or if all of it) could be represented by the respondents of the Panel. This meant estimating the coverage error of the ICT Panel in relation to the target population initially considered in the survey.

In this edition of the ICT Panel, the audience represented was equivalent to the entire target population of the ICT Households survey, which allowed direct comparison of the results of the edition with the equivalent indicators collected. In relation to the previous editions of the Panel, which did not represent the entire target population, this comparison needed to be made using the same population cutouts of the respective editions.

The full results of the survey are available at Cetic.br|NIC.br’s website ([http://](http://www.cetic.br/en/) [www.cetic.br/en/](http://www.cetic.br/en/)), in addition to the survey’s full “Methodological Report”.

# ICT Enterprises – Small, medium, and large enterprises (2021)

Conducted since 2005, the ICT Enterprises survey aims to measure the ownership and use of ICT among Brazilian companies. The survey presents indicators that translate into numbers for the reality of Brazilian companies in relation to various topics, such as ICT access; Internet use; e-government; e-commerce; ICT skills; software; digitalsecurity and new technologies.

The universe covered in the survey includes all active Brazilian enterprises with 10 or more employed persons**4** registered in the Central Register of Enterprises (Cempre) of IBGE, belonging to the sectors of the National Classification of Economic Activities (CNAE) 2.0 of interest to ICT companies, and meeting the definition of Legal Nature Type 2 — business entities — except for public enterprises (Legal Nature. 201-1).

**2 Unlike estimates based on a traditional sample design, the selection probabilities in the Panel are unknown and undefined, because of its pseudo-sample design. Pseudoprobability is the estimated probability of belonging to the non-probability sample used instead of a known probability. More information in Baker, R., Brick, J. M., Bates, N. A., Battaglia, M., Couper, M. P., Dever, J. A., Gile, K. J., & Tourangeau, R. (2013). *Report of the AAPOR Task Force on non-probability sampling*.** [**https://www.**](https://www.aapor.org/AAPOR_Main/media/MainSiteFiles/NPS_TF_Report_Final_7_revised_FNL_6_22_13.pdf)[**aapor.org/AAPOR\_Main/media/MainSiteFiles/NPS\_TF\_Report\_Final\_7\_revised\_FNL\_6\_22\_13.pdf**](https://www.aapor.org/AAPOR_Main/media/MainSiteFiles/NPS_TF_Report_Final_7_revised_FNL_6_22_13.pdf)

**3 For the this edition of the ICT Panel, the ICT Households 2020 survey was used (CGI.br, 2021c).**

**4 The ICT Enterprises survey considers small, medium, and large enterprises with 10 to 49 employed persons, 50 to 249 employed persons, and 250 employed persons or more, respectively. Microenterprises, those with 1 to 9 employed persons, are not within the scope of the survey.**

The surveyed enterprises operated in the following segments: C – Manufacturing;

F – Construction;

G – Wholesale and retail trade; repair of motor vehicles and motorcycles; H – Transportation and storage;

I – Accommodation and food service activities; J – Information and communication;

L – Real estate activities;

M – Professional, scientific and technical activities; N – Administrative and support service activities; R – Arts, entertainment and recreation;

S – Other service activities.

The ICT Enterprises survey was developed to maintain international comparability. It uses the methodological standards proposed in the Manual for the Production of Statistics on the Information Economy (UNCTAD, 2009), prepared in partnership with the Organisation for Economic Co-operation and Development (OECD), the Statistical Office of the European Communities (Eurostat), and the Partnership on Measuring ICT for Development, a coalition formed by various international organizations that seeks to harmonize key indicators in ICT surveys.

The sampling plan is stratified in two steps, and the enterprises are selected randomly within each stratum. The first step covers the definition of natural strata by correlating the variables geographic region and market segment (CNAE 2.0). The final strata are defined from each natural stratum, which considers the division of natural strata by enterprise size**5**. In 2021, the survey interviewed a total of 4,064 enterprises and 1,473 answered specific questions about privacy and personal data protection, Enterprises were contacted for interviews using the computer-assisted telephone interviewing (CATI) technique. In all enterprises, the survey sought to interview the persons in charge of information technology, computer network management, or similar areas, which corresponded to positions such as:

* + Information and technology directors;
  + Business managers (senior vice presidents, business vice presidents, directors);
  + Technology managers or buyers;

**5 The size ranges considered were 10 to 19 employed persons, 20 to 49 employed persons, 50 to 249 employed persons, and 250 or more employed persons.**

* Technology influencers (employed persons in commercial or IT operations departments who influenced decisions on technology issues);
* Project or system coordinators;
* Directors of other departments or divisions (excluding IT);
* System development managers;
* IT managers;
* Project managers;
* Enterprise owners or partners.

In enterprises with 250 or more employed persons at the time of the interview, the strategy employed was to interview a second professional, preferably the accounting or finance manager. If this professional was not found, the person responsible for the administrative, legal or relations with government institutions was sought, who exclusively answered questions about electronic commerce, electronic government, and activities carried out on the Internet.

**ICT ENTERPRISES 2021 – “PRIVACY AND PERSONAL DATA PROTECTION” MODULE**

In 2021, to meet the demand for data on how small, medium, and large enterprises process the personal data of their customers/consumers, in addition to relevant issues associated with the implementation of the LGPD in Brazil, a module was created to be implemented in parallel with the ICT Enterprises 2021 survey.

An additional person considered qualified to respond about measures relative to LGPD compliance in the enterprise was chosen to be interviewed for the specific data protection module. The respondents of the ICT Enterprises survey were asked to recommend the person that most knew about the topic in the enterprise, i.e., someone who could provide information about the procedures and policies adopted in the collection, storage, and use of personal data, in addition to the enterprise’s compliance with the LGPD. In cases where the topic was handled by the same respondent of ICT Enterprises, the interview was conducted with this professional. The enterprise could not appoint a third-party professional as a respondent. Instead, they had to identify the in-house employee responsible for hiring this service, ensuring that interviews were conducted with members of the enterprise’s internal team.

All enterprisesresponding to the survey had a 50% probability of being selected to respond to the privacy and personal data protection module. This selection probability guaranteed representativeness like that expected for the ICT Enterprises survey. Given that the sample size was smaller compared to that obtained in this last survey, some indicators were expected to present higher sampling errors.

*w*

*LGPD*

*ih*

=

1

2

× *w* 1 × *w* ×

*\**

=

*Nh*

*w LGPD* **is the basic weight of enterprise *i* respondent in**

*ih*

*ih*

2

*ih*

***∑*** *w*

***i*** *ih*

**stratum *h***

*w\** **is the weight with nonresponse adjustment for enterprise *i***

*ih*

where

*w*

*ih*

**in stratum *h***

**is the basic weight associated with each enterprise *i***

**responding to the ICT Enterprises survey in the stratum *h***

*w*

*N*

*ih*

=

*nh*

*h*

*nh* **is the enterprise sample size in stratum *h***

*N* **is the total number of enterprises in stratum *h***

*h*

*w\**

*LGPD LGPD*

*ih*

=*wih*

×

*Nh*

*w\* LGPD* **isthe weight with nonresponse adjustment for enterprise**

*ih*

***∑*** *w*

*LGPD*

***i* respondent in stratum *h***

***i*** *ih*

Based on this probability of selection, the initial weight of the enterprises that responded to the data protection and privacy module was obtained by Formula 1.

FORMULA 1

To adjust for cases when not all the selected enterprises answered the questionnaire, an adjustment for nonresponse was given by Formula 2.

FORMULA 2

Finally, these sampling weights were calibrated to reflect the known population totals, obtained in the IBGE Cempre. This procedure, together with the non-response adjustments, aimed to correct the variability associated with non-response among the enterprise population. The variables considered for calibration were geographic region, market segment, and enterprise size.

Table 1 shows the distribution of the number of enterprises by geographic region, market segment, and size, according to Cempre, in addition to the allocation of the sample eligible to participate in the module and the sample that responded to this module. The response rate for the module was 74%.

TABLE 1

**NUMBER OF ENTERPRISES BY SIZE, GEOGRAPHIC REGION, AND MARKET SEGMENT (2021)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Universe** | **Sample**  **selected among respondents from ICT Enterprises** | **Respondent sample** |
| **Total** | **509 049** | **1 982** | **1 473** |
| **Size** |  |  |  |
| **10 to 49 employed persons** | **310 023** | **696** | **512** |
| **20 to 49 employed persons** | **136 438** | **530** | **391** |
| **50 to 249 employed persons** | **51 780** | **326** | **245** |
| **250 or more employed persons** | **10 808** | **430** | **325** |
| **Region** |  |  |  |
| **North** | **22 122** | **254** | **176** |
| **Northeast** | **78 059** | **298** | **216** |
| **Southeast** | **260 094** | **810** | **596** |
| **South** | **107 162** | **372** | **296** |
| **Center-West** | **41 612** | **248** | **189** |
| **Market segment (CNAE 2.0)** |  |  |  |
| **Manufacturing** | **98 870** | **343** | **278** |
| **Construction** | **34 880** | **209** | **169** |
| **Wholesale and retail trade; repair of motor vehicles** | **195 839** | **458** | **314** |
| **Transportation and storage** | **29 111** | **201** | **146** |
| **Accommodation and food service activities** | **56 903** | **192** | **141** |
| **Information and communication** | **14 085** | **187** | **133** |
| **Real estate activities; professional, scientific, and technical activities; administrative and support service activities** | **66 643** | **208** | **159** |
| **Arts, culture, sports, and recreation; other service activities** | **12 718** | **184** | **133** |

**SOUR CE: CGI.BR (IN PRESS).**

The results and tables of proportions, estimates and margins of error for ICT Enterprises are available for download on Cetic.br|NIC.br’s website ([https://www.](https://www.cetic.br/en/) [cetic.br/en/](https://www.cetic.br/en/)), in addition to the full version of the survey’s Methodological Report and Data Collection Report.

# ICT Electronic Government – Federal and state government organizations and local governments (2021)

Carried out every two years since 2013, the Survey about the use of information and communication technology in the Brazilian public sector — ICT Electronic Government — investigates the incorporation of digital technology in government organizations and its use in the provision of public services. This survey also measures the presence of initiatives related to promoting access to ICT and societal participation via the new technologies. In 2021, new modules were included related to the use of ICT in the fight against the pandemic and the adoption of new technologies. The 2021 edition also incorporated indicators on privacy and protection of personal data.

The survey was carried out nationwide and included two units of analysis: federal and state government organizations of all branches (executive, legislative, judiciary, and the Public Prosecutor’s office) and local governments. A census was carried out in all the audiences of interest, except for state executive organizations, in which a sample of 400 government entities was selected. All interviews were carried out using a structured questionnaire using the computer-assisted telephone interviewing (CATI) technique.

The indicators analyzed for this publication were collected between August 2021 and April 2022, in 580 federal and state government organizations and 3,543 local governments. The results and tables of proportions, estimates and margins of error for ICT Electronic Government are available for download on Cetic.br|NIC.br’s website (<http://www.cetic.br/en/>), in addition to the full version of the survey’s Methodological Report and Data Collection Report.**6**

# ICT in Health – Public healthcare facilities (2021)

Carried out annually since 2013**7**, the ICT in Health survey has the objective of understanding the stage of ICT adoption in healthcare facilities and its appropriation by professionals in the area (physicians and nurses). To this end, it seeks to identify the available ICT infrastructure and investigate the use of ICT-based systems and applications directed at supporting the care delivery and management services of healthcare facilities. Furthermore, it measures the activities carried out by healthcare professionals via ICT, in addition to motivations for and barriers to its adoption and use.

**6 Available at:** [**https://cetic.br/media/docs/publicacoes/2/20220725170710/tic\_governo\_eletronico\_2021\_livro\_eletronico.pdf**](https://cetic.br/media/docs/publicacoes/2/20220725170710/tic_governo_eletronico_2021_livro_eletronico.pdf)

**7 The ICT in Health survey was not carried out in 2020, due to the restrictions imposed on access to healthcare managers and professionals during the COVID-19 pandemic.**

In 2021, the survey included one indicator that investigated the healthcare facility’s compliance with the terms of the LGPD**8**. This new question was answered by healthcare facility managers (CGI.br, 2021d).

The ICT in Health survey is carried out nationwide and collects data from healthcare facilities at the three levels of care, selected based on the National Registry of Healthcare Facilities (CNES) maintained by the SUS Informatics Department (Datasus). Interviews were conducted using the using the computer-assisted telephone interviewing (CATI) technique, and for those who could not answer it online, there was a self-administered web version of the questionnaire that could be accessed via a specific platform.

The results of the 2021 edition were collected between January and August of the same year with 1,524 managers, representing a universe of 112,075 Brazilian healthcare facilities. The results and tables of proportions, estimates and margins of error for ICT in Health are available for download on Cetic.br|NIC.br’s website ([https://www.](https://www.cetic.br/en/) [cetic.br/en/](https://www.cetic.br/en/)), in addition to the full version of the survey’s Methodological Report and Data Collection Report.**9**

# ICT in Education – Public schools (2020)

Carried out nationwide since 2010, the ICT in Education survey is administered in Basic Education schools, both public and private, that are located in urban and rural areas and provide regular Elementary and Secondary Education.

Up to 2019, in urban areas, the survey was carried out in person at the educational facilities, administering structured questionnaires to students, teachers, directors of studies, and principals. In rural areas, it began to be carried out in 2017, with questionnaires applied to the managers of the institutions by phone.

In 2020, because of school closures and the dissemination of remote educational activities as part of the health measures implemented by states and municipalities across the country to fight against the COVID-19 pandemic, data collection for the ICT in Education survey was carried out only with school managers and based on completely telephone-based interviews, for schools located in both rural and urban areas (CGI.br, 2021b).

Despite the necessary adjustments of data collection to comply with health measures, it was possible to expand the dimensions and themes addressed by the survey, with the inclusion of questions about the use of systems, platforms, and applications by schools, in addition to actions implemented by them regarding personal data protection, privacy, and digital security.

**8 In the 2021 edition, it was not possible to interview healthcare professionals given the restriction to accessing this audience during the COVID-19 pandemic.**

**9 Available at:** [**https://cetic.br/media/docs/publicacoes/2/20211130124545/tic\_saude\_2021\_livroeletronico.pdf**](https://cetic.br/media/docs/publicacoes/2/20211130124545/tic_saude_2021_livroeletronico.pdf)

The data analyzed in this publication was collected between September 2020 and June 2021, in 3,678 functioning public and private schools in urban and rural areas. These institutions offered Elementary and Secondary Education, representing 127,171 schools, based on a sample extracted from the database of the Basic Education School Census carried out by the National Institute for Educational Studies and Research “Anísio Teixeira” (Inep).

Like the other surveys, the results, and tables of proportions, estimates and margins of error for ICT in Education are available for download on Cetic.br|NIC.br’s website (<http://www.cetic.br/en/>), in addition to the full version of the survey’s Methodological Report and Data Collection Report.**10**

# Data dissemination

The results of the surveys mentioned above are presented according to the variables described in each survey’s Methodological Report, under the item “Domains of interest for Analysis and Dissemination.”

Rounding made it so that for some results, the sum of the partial categories differed from 100% for single-answer questions. The sum of frequencies on multiple-answer questions is usually different from 100%. It is worth noting that, in cases with no response to the item, a hyphen was used. Since the results are presented without decimal places, a cell’s content is zero whenever an answer was given to that item, but the result for this cell is greater than zero and smaller than one.

The survey results are published on the Cetic.br|NIC.br website ([http://www.cetic.](http://www.cetic.br/en/) [br/en/](http://www.cetic.br/en/)). The tables of proportions, estimates and margins of error for each indicator are available for download in Portuguese, English and Spanish. More information about the survey’s documentation, metadata and microdata bases are available on the Cetic.br|NIC.br microdata page (<https://cetic.br/en/microdados/>).

**10 Available at:** [**https://cetic.br/media/docs/publicacoes/2/20211124200326/tic\_educacao\_2020\_livro\_eletronico.pdf**](https://cetic.br/media/docs/publicacoes/2/20211124200326/tic_educacao_2020_livro_eletronico.pdf)

# References

Brazilian Institute of Geography and Statistics (n.d.). *Continuous National Household Sample Survey (Continuous Pnad)*. [https://www.ibge.](https://www.ibge.gov.br/estatisticas/sociais/trabalho/9173-pesquisa-nacional-por-amostra-de-domicilios-continua-trimestral.html) [gov.br/estatisticas/sociais/trabalho/9173-](https://www.ibge.gov.br/estatisticas/sociais/trabalho/9173-pesquisa-nacional-por-amostra-de-domicilios-continua-trimestral.html) [pesquisa-nacional-por-amostra-de-domicilios-](https://www.ibge.gov.br/estatisticas/sociais/trabalho/9173-pesquisa-nacional-por-amostra-de-domicilios-continua-trimestral.html) [continua-trimestral.html](https://www.ibge.gov.br/estatisticas/sociais/trabalho/9173-pesquisa-nacional-por-amostra-de-domicilios-continua-trimestral.html)

Brazilian Internet Steering Committee. (in press). *Survey on the use of information and communication technologies in Brazilian enterprises: ICT Enterprises 2021*.

Brazilian Internet Steering Committee. (2020). *Painel TIC COVID-19: Pesquisa sobre o uso da Internet no Brasil durante a pandemia do novo coronavírus - 2a edição: Serviços públicos on-line, telessaúde e privacidade.* [https://cetic.br/](https://cetic.br/media/docs/publicacoes/1/20201001085713/painel_tic_covid19_2edicao_livro%20eletr%C3%B4nico.pdf) [media/docs/publicacoes/1/20201001085713/](https://cetic.br/media/docs/publicacoes/1/20201001085713/painel_tic_covid19_2edicao_livro%20eletr%C3%B4nico.pdf) [painel\_tic\_covid19\_2edicao\_livro%20](https://cetic.br/media/docs/publicacoes/1/20201001085713/painel_tic_covid19_2edicao_livro%20eletr%C3%B4nico.pdf) [eletr%C3%B4nico.pdf](https://cetic.br/media/docs/publicacoes/1/20201001085713/painel_tic_covid19_2edicao_livro%20eletr%C3%B4nico.pdf)

Brazilian Internet Steering Committee. (2021a). *Web survey on the use of Internet in Brazil during the new coronavirus pandemic: ICT Panel COVID-19*. [https://cetic.br/media/docs/](https://cetic.br/media/docs/publicacoes/2/20210426095323/painel_tic_covid19_livro_eletronico.pdf) [publicacoes/2/20210426095323/painel\_tic\_](https://cetic.br/media/docs/publicacoes/2/20210426095323/painel_tic_covid19_livro_eletronico.pdf) [covid19\_livro\_eletronico.pdf](https://cetic.br/media/docs/publicacoes/2/20210426095323/painel_tic_covid19_livro_eletronico.pdf)

Brazilian Internet Steering Committee. (2021b). *Survey on the use of information and communication technologies in Brazilian schools: ICT in Education 2020 (COVID-19 edition — Adapted methodology)*. [https://www.cetic.br/](https://www.cetic.br/media/docs/publicacoes/2/20211124200326/tic_educacao_2020_livro_eletronico.pdf) [media/docs/publicacoes/2/20211124200326/](https://www.cetic.br/media/docs/publicacoes/2/20211124200326/tic_educacao_2020_livro_eletronico.pdf) [tic\_educacao\_2020\_livro\_eletronico.pdf](https://www.cetic.br/media/docs/publicacoes/2/20211124200326/tic_educacao_2020_livro_eletronico.pdf)

Brazilian Internet Steering Committee. (2021c). *Survey on the use of information and communication technologies in Brazilian households: ICT Households 2020* (*COVID-19 edition — Adapted methodology)*. [https://cetic.br/](https://cetic.br/media/docs/publicacoes/2/20211124201233/tic_domicilios_2020_livro_eletronico.pdf) [media/docs/publicacoes/2/20211124201233/](https://cetic.br/media/docs/publicacoes/2/20211124201233/tic_domicilios_2020_livro_eletronico.pdf) [tic\_domicilios\_2020\_livro\_eletronico.pdf](https://cetic.br/media/docs/publicacoes/2/20211124201233/tic_domicilios_2020_livro_eletronico.pdf)

Brazilian Internet Steering Committee. (2021d). *Survey on the use of information and communication technologies in Brazilian healthcare facilities: ICT in Health 2021 (COVID-19 edition*

*— Adapted methodology).* [https://www.cetic.br/](https://www.cetic.br/media/docs/publicacoes/2/20211124123911/tic_saude_2021_livro_eletronico.pdf) [media/docs/publicacoes/2/20211124123911/](https://www.cetic.br/media/docs/publicacoes/2/20211124123911/tic_saude_2021_livro_eletronico.pdf) [tic\_saude\_2021\_livro\_eletronico.pdf](https://www.cetic.br/media/docs/publicacoes/2/20211124123911/tic_saude_2021_livro_eletronico.pdf)

International Telecommunications Union. (2020). *Manual for measuring ICT access and use by households and individuals, 2020 edition*. [https://www.itu.int/en/ITU-D/Statistics/](https://www.itu.int/en/ITU-D/Statistics/Pages/publications/manual.aspx) [Pages/publications/manual.aspx](https://www.itu.int/en/ITU-D/Statistics/Pages/publications/manual.aspx)

United Nations Conference on Trade and Development. (2009). *Manual for the production of statistics on the information economy 2009*. [http://www.unctad.org/en/docs/](http://www.unctad.org/en/docs/sdteecb20072rev1_en.pdf) [sdteecb20072rev1\_en.pdf](http://www.unctad.org/en/docs/sdteecb20072rev1_en.pdf)