saúde EM DEBATE

ORIGINAL ARTICLE

Analysis of methodological clarity as a quality dimension of the National Register of Health Establishments

Análise da clareza metodológica como dimensão de qualidade do Cadastro Nacional de Estabelecimentos de Saúde

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ABSTRACT This article analyzes the quality dimension of methodological clarity of the National Registry of Health Establishments (CNES), considering the approach to forms of contracting in the system. This is a documentary research with a qualitative approach, which analyzed the CNES and its documents. Documents that included the following were selected: table of professional relationships and/or forms of hiring. Based on the concept adopted for the dimension of methodological clarity quality, the categories accessibility, content, variables, language, and usability were outlined. In the period from 2005 to 2020, 17 documents were published. Of those, three documents stood out: The version's Readme, the Domain Table, and the CNES Filling Manual. The CNES website underwent restructuring and not all features were completed. The current website has a more modern and easy-to-understand interface. The change from the administrative sphere variable to the legal nature, in 2015, may make historical series analysis difficult. It is evident that the CNES pays more attention to methodological clarity, considering the approach to the ways of hiring health professionals, included in the system.

KEYWORDS Health Information Systems. Data analysis. Health personnel. Censuses.

RESUMO *Este artigo analisa a dimensão de qualidade clareza metodológica do Cadastro Nacional de Estabelecimentos de Saúde (CNES), considerando a abordagem das formas de contratação inseridas no sistema. Trata-se de uma pesquisa documental com abordagem qualitativa, que analisou o CNES e seus documentos. Foram selecionados os documentos que contemplaram os descritores: tabela de vínculos de profissionais e/ou formas de contratação. A partir do conceito adotado para a dimensão de qualidade clareza metodológica, foram delineadas as categorias acessibilidade, conteúdo, variáveis, linguagem e usabilidade. No período de 2005 a 2020, foram publicados 17 documentos. Desses, três documentos se sobressaíram: o Leia-me da versão, a Tabela de Domínios e o Manual de preenchimento do CNES. O site do CNES passava por uma reestruturação, e nem todas as funcionalidades estavam devidamente implementadas. O site atual apresentou uma interface mais moderna e de fácil compreensão. A mudança da variável esfera administrativa para natureza jurídica, em 2015, pode dificultar a análise em série histórica. Evidencia-se que o CNES carece de melhor atenção quanto à clareza metodológica, considerando a abordagem das formas de contratação dos profissionais de saúde, inseridas no sistema.*

PALAVRAS-CHAVE *Sistemas de Informação em Saúde. Análise de dados. Pessoal de saúde. Censos.*

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Introduction

Health information presents itself as a decision-making instrument based on knowledge of the socioeconomic, demographic and epidemiological reality, aiming at planning, management, organization and evaluation at the different levels of care of the Unified Health System (SUS)[1]. Health Information Systems (SIS) are defined as tools that "support the production of information for a better understanding of problems and decision-making within the scope of health policies and care"[2(2)].

Thus, SIS are instruments for acquiring, organizing and analyzing fundamental data for defining health problems and risks; to evaluate the efficiency, effectiveness and influence that the services provided may generate on the health of the population; and that contribute to the production of knowledge in relation to health and related topics[3]. It is worth noting that most SIS were implemented within the municipalization of health, with this federated entity playing a fundamental role in the production of information[1].

The priority for the quality of information in the SIS is an essential condition for the process of analyzing the health situation, which will provide managers subsidies for more appropriate decisions and planning of health actions[4]. Discussions on the topic of information quality are recent. The first took place at the Nordie Council for Scientific Information and Research Libraries (Nordinfo) Seminar, in 1989, in Copenhagen, Denmark[5]. Since then, there has been a lack of consensus on the definition of the term information quality, as it presents a multidimensional character and multifaceted concept, which explains its conceptual complexity[6,7].

Given the absence of a consensus on the concept of information quality, in this study, the proposal by Lima et al.[4(2096)] is assumed, who, in a study on the review of data quality dimensions, define that "quality information is that which is suitable/convenient for use, in terms of the user's needs".

The same authors reported that monitoring the quality of SIS in Brazil did not have a regular evaluation plan by the Ministry of Health, which led to a range of non-systematic or isolated initiatives. In view of this situation, they proposed reviewing the SIS quality assessment initiatives that addressed quality dimensions and described the methods used. As a result, they identified nine dimensions: accessibility, reliability, consistency, non-duplicity, timeliness, validity, coverage and completeness and methodological clarity[4].

Among the nationally based systems that lack analysis regarding data quality, the National Registry of Health Establishments (CNES) stands out, which plays a relevant role in the SUS, as it constitutes a registration basis for the operationalization of more than 90 SIS. CNES data provides knowledge of the reality of the country's healthcare network, in addition to being essential in the area of health planning, control and evaluation in the three federative entities[8,9].

The CNES also includes information from professionals who perform health actions and/or services in Brazil, whether they have links with the SUS or not. Its importance as a source of data and as a useful tool for describing the profile of professionals who integrate health services is evident. Furthermore, among the information registered there are: the type of position, the type of contract/form of contracting, the workload, among others[10,11].

Since the creation of the SUS, there has been significant growth in the health sector. In 2017, there were 200,049 healthcare establishments and 3,594,596 healthcare jobs registered with the CNES, considering the public and private sector. However, the public sector is the main employer in health with more than 61% of the total (2,209,285) jobs distributed as follows among the federative entities: federal with 4.37% (96,491), state with 20.99% (463,720) and municipal with 74.64% (1,649,074)[12]. These numbers demonstrate the importance of the public sector for the health job market, especially for municipal entities.

The changes in the increase in different types of hiring and personnel management in recent decades by federal, state and municipal public administration are highlighted. In addition to the forms of contracting defined by the 1988 Federal Constitution (statutory, CLT, special and commission positions), configured as employment relationships, other forms were incorporated: work grants; temporary hiring; internships; contracts by international bodies; cooperatives; work linked indirectly through Social Organizations (OS) and Civil Organizations of Public Interest (Oscip); work linked indirectly through philanthropic entities and private foundations, which differ from so-called employment relationships[13,14].

Silva[11], when carrying out an integrative review of the literature on the CNES, from 2003 to 2020, found a sample of 59 articles, of which only 2 had the system as a central theme. Of the 25 that addressed the CNES information quality topic, only 8 presented evidence on the subject and, of these, 2 stood out for being the result of more detailed research. In no article was the quality dimension of CNES methodological clarity analyzed.

Several authors have used this system in their studies and corroborate the legitimacy of its use, as well as the need for more research to continue exploring the CNES[8,10,15,16]. However, there are studies that point out the lack of consistency in the data available at CNES, as evidenced by Mendes and Rattner[17] and Gomes, Gutiérrez and Soranz18. This limitation must be considered, but it does not preclude the use of data from the CNES, given that, in research using this database, relevant information has been produced for knowledge about the SUS care network. In this sense, recognizing its limitations allows for improvement through the evaluation of its quality dimensions.

From this perspective, the study aims to analyze the quality dimension of methodological clarity of the CNES and its documents, considering the approach to the forms of professional hiring inserted in the system.

Material and methods

This is a documentary research with a qualitative approach, according to Kripka, Scheller and Bonotto[19], which sought to produce new knowledge, based on the analysis of the CNES and the documents that accompany it, regarding the methodological clarity of the system in relation to the recording of forms of hiring of registered professionals.

In this study, the conceptualization of the quality dimension of methodological clarity presented by Lima[4(2096)] was adopted:

> [...] degree to which the documentation that accompanies the SIS (collection instructions, filling manuals, variable value domain tables, data models, etc.) describes the data without ambiguity, in a succinct, didactic and complete manner, and in easy-to-understand language.

The documents, the research corpus, were collected on the new CNES[20] website, from August to November 2021, in the 'Documentation' folder in the download page. The consultation focused on documents published between 2005 and 2020, as a second version of the registry was made available in October 2005, considered an evolution of the previous one, called the National Health Establishment Registry System (SCNES). The proposal contained a complete reformulation of the system, including a general change in the layout, a review of the registration screens and the adoption of a new platform. Furthermore, there was the publication of the standard of the National Health Surveillance Agency (Anvisa), in 2006, which defined the mandatory nature of the CNES for all health establishments in the country, regardless of their legal nature or whether or not they are part of the SUS[9] network.

17 technical and normative documents were found: manuals, ordinances, registration forms, TXT Layout Notebooks and other database documentation relating to the ways in which registered professionals are hired.

These documents were identified with the letter 'D' followed by a number, which corresponds to the numerical order of their presentation on the new website (D00). After identifying these documents, those that included the descriptors: 'table of professional relationships' and/or 'forms of hiring' were selected. The files selected for analysis were classified according to: file name, year of publication, brief description of the document, main findings, and which descriptor it included.

Then, based on the concept adopted for the quality dimension of methodological clarity, five categories were outlined for analysis of the CNES and the selected documents, as described in *table 1*.

Table 1. Analysis categories of the quality dimension of methodological clarity

Category type	Description
Accessibility	Refers to access to the system and availability of documentation.
Content	It relates to the subjects covered in the documents regarding forms of contracting.
Variables	It includes the existence of definitions and coding of variables relating to forms of contracting, which must be clear and allow comparability.
Language	It concerns the clarity of the language used in manuals and/or documents in order to facilitate understanding in a didactic way.
Usability*	It concerns the aesthetics and clarity of the system interface (screens/forms/data input/reports/graphics) with the user.

Source: Own elaboration.

*Adapted from Morais et al.[21].

The categories accessibility, content, variables and language were proposed from this study based on the concept of the quality dimension of methodological clarity proposed by Lima et al.[4]; and the usability category was adapted from Morais et al.[21] and is consistent with the concept adopted for the quality dimension analyzed in the study in question. Based on the categories described, the CNES and its documents were analyzed with regard to forms of contracting, the results of which will be presented below.

Results and discussion

Health information is essential to support decision-making. In Brazil, in addition to the information systems for monitoring diseases and programs and those of care and epidemiological rationality, the CNES presents itself as an important information system, which supports not only the characterization of the health network but also the dimensioning of the workforce linked or not to the SUS.

This information needs to be of quality in order to guide the analysis of the health situation and the planning of public policies capable of meeting the broad health needs of the population. According to Coelho et al.[2] and Coriolano et al.[1], one of the issues inherent to the SIS is the production of information that aims to better understand existing health problems, constituting an instrument for their evaluation at the different levels of SUS care.

To this end, access to information systems and the availability of instructions and documents that guide the use and feeding of SIS are essential for the quality of information. In this sense, methodological clarity is a quality

dimension that needs to be addressed by the SIS, and the analysis categories presented below evaluate this dimension of the CNES and its documents.

Accessibility

This category of the CNES methodological clarity quality dimension was analyzed through access to this SIS, which happened between August and November 2021. When accessing the CNES, it was verified, based on a message highlighted on the new website, that it was undergoing restructuring, with all its features not being properly implemented. For some types of searches, it was necessary to resort to the previous version of the site, which happens empirically because it is not clear which features and types of searches were not yet implemented. It is known that updating SIS is a process that aims to improve the quality of the data produced, however, it cannot compromise access.

Access to documentation with guidance on the system was not available on the new download site. It was necessary to send an e-mail to those responsible for CNES (cnes@saude.gov.br) regarding access to the documents. The response stated that the new CNES website used the File Transfer Protocol environment (FTP), and that this environment no longer allowed access through some browsers. Therefore, documents for analysis can only be obtained following instructions found on the CNES Wiki[9].

A system whose information relates to health establishments and professionals throughout the country's network must be based on easy access, ensuring that there is no inaccessibility. In this context, Bittar et al.[22] reflect that agility in accessing information is essential for the quality of health services. In addition to the provision of services, the possibility of easy and timely access is fundamental for guiding measures relating not only to knowledge of the health situation, but also to the management of the information systems themselves.

Health workers are an essential part of complying with constitutional provisions relating to the right to health in Brazil. This makes it pertinent to improve the content of the information found in the system, which has the possibility of sizing all workers, including by professional category. Therefore, the CNES can contribute to the understanding of care gaps and point out ways to respond. From this perspective, Gonçalves et al.[23] proposed to analyze the distribution of specialist medical professionals and concluded that the results could support discussions and the development of public policies aimed at healthcare equity in the health region analyzed.

Regarding the accessibility of the system, it can be stated that this category did not perform satisfactorily and points to the need to submit this criticism to the responsible body to verify the inconsistencies found because access is essential.

Content

In the period from 2005 to 2020, 17 documents were published that provide guidance to managers of the three federative entities and the Federal District regarding the registration of professionals and outpatient and hospital health establishments located in the national territory. They are: five manuals, a zipped file with the various forms to fill out, six layout notebooks, two Read Me versions (full and simplified version), a data dictionary, a domain table and a glossary of reviews.

From the set of available documents, only five were selected for analysis (D1, D2, D8, D12, D14), as they included the descriptors 'professional relationship table' and/or 'contracting methods'. Documents D2 and D8, entitled Simplified Read-me and Layout Notebook for Generation of the TXT File for Adequacy of Professional Relationships from other Systems, respectively, were not analyzed

because the first is a more summarized compilation of D1, adding only technical changes; The second updates the contracting forms inserted in version 3.2.40. of the system and already contained in document D1. *Table 2* below presents an analysis of the content category of the three documents.

Table 2. CNES documents according to file identification, year of publication, main findings regarding the form of contracting. Brazil. 2005 to 2020

No	Document name	Year of publication	Brief description of the document	Main findings	Descriptors
D 1	Readme of the version	Dez./2020	The Readme document is a compilation of the versions made available by the system from 2005 to the present day. At the time of collection, it already had 184 versions. These versions include the insertion of new information necessary for the CNES to be fed by system users.	Refers to the identification of the 13 versions of the CNES related to forms of contracting: 4.1.80; 4.1.60; 4.1.40; 4.0.61 (not mandatory); 4.0.60; 4.0.30; 3.2.80; 3.2.50; 3.2.30; 3.1.80; 3.1.00; 2.2.90; 2.1.7.	Table of professional relationships/hiring methods
D 12	Table of domains	Out./19	It consists of a file in Excel® format that presents the codes and information (domains) made available in CNES to be fed by managers.	Focusing on the domains that deal with forms of contracting, 58 codes related to forms of contracting are identified in the Employer's Forms of Contracting tab.	Forms of contracting
D 14	SCNES filling manual	Out./2006	Document that aims to a better understanding of the system and presents its objectives. It has many annexes with tables related to the use of the system by health establishments and municipal and state managers.	In Annex 28, there is a table of relationships with 11 types of contracting forms.	Professional Relationships Table

Source: Own elaboration.

The document entitled Readme version (D1) stands out, which, according to the description given by CNES, is a

> [...] document through which the team responsible for developing the system informs users of the new features and improvements promoted in the version identified in the body of the text[23(1)].

This document is dense and very extensive (930 pages) because it is a compendium of the 184 versions of the CNES, made available between 2005 and 2020. Among the information, it is noted that 13 versions relate to forms of contracting[20]. It is noteworthy that, among these, version 3.1.00 presents the new table of health professional relationships in the CNE Professional Registration Module, without mentioning in the legal/normative references which ordinance this table is related to. This may reveal, despite the inclusion of the table, the existence of a gap in information about the forms of contracting.

Considering the 16 years that passed between 2005 (CNES update) and 2020 (final

period of the study), an average of 11.5 versions of the CNES made available each year can be observed. This finding suggests the need for operators to be constantly updated on how to handle the CNES. These professionals are, for the most part, technicians and/or municipal managers who enter data regarding how health professionals are hired in the CNES. It is worth noting that there is a turnover of these managers and/or technicians, either due to the electoral cycle or due to the precariousness of institutional bonds, which points to potential problems with the system's data entry.

The Domain Tables document (D12) consists of an Excel® spreadsheet with around 50 tabs, which describe the data codes to be inserted into the CNES fields. It was possible to identify three tabs that relate to the forms of contracting, which are defined by Ordinance No. 1,321, of July 22, 2016, which was revoked and assimilated by Consolidation Ordinance No. 1, of September 28, 2017. This norm, in its art. 381, defines and hierarchizes the terminology used to hire health professionals[24].

The Domain Tables document (D12) presents the codes for the professional's contracting methods with health establishments as well as the database to be tabulated. It is important to highlight that coding allows variables to be comparable in historical series. The number of forms of contracting, enabled or not, found in the detailed description is 58. Therefore, one can understand the complexity of filling out the CNES and the need for a strategy to support managers.

In this sense, the official CNES page (Wiki CNES) points to the growth of the system's scope without there having been discussions with municipal and/or state departments and suggests doubts about the operational capacity of health departments to deal with the changes made in the system throughout its historical course[9].

Furthermore, this growth in the scope of the CNES is possibly related, among other factors, to the increase in jobs offered by the SUS throughout its trajectory, as pointed out by Machado et al.[12]. There are at least 3.5 million workers who perform their duties in multidisciplinary, qualified and specialized teams. Additionally, the authors reported the persistence of structural problems, especially in the management of the work of the SUS, given its gigantism. Other issues raised concern the precariousness and outsourcing of work in health services, associated with the lack of professionals in areas outside large urban centers, revealing this to be a structural problem.

The document CNES Filling Manual (D14), released in 2006, simultaneously with the second version of the system, presents its structure; its relevance; its legal basis and normative acts related to changes in the various registrations; its goals; general instructions for filling out CNES forms; and tables relating to registration configurations. Of the five manuals found in the 'documents' folder, this is the only one that presents a professional relationship table.

Thus, despite the forms of contracting being a relevant topic for public administration and for the SUS care model, guided by Primary Health Care, the support capacity of this manual and others, as well as the documents analyzed, does not corresponds to this relevance and is not capable of instrumentalizing the system's users, considering the expansion of the forms of contracting incorporated into the CNES throughout this period. This expansion can be seen in the fact that the 11 codes relating to contracting forms available in Annex 28 of the CNES Technical Manual (D14), in 2006, became 58 codes available in the Domain Tables document (D12), in 2019. Therefore, it can be said that the content category does not correspond to expectations and compromises the methodological clarity of these documents and the CNES.

Variables

In this category, we sought to observe whether the definitions and coding of the variables related to the forms of contracting available

in the CNES and in the documents analyzed (D1, D12 and D14) allow comparability. The variables are important for developing research and supporting management processes. Therefore, the availability of variables must allow comparability between data produced in different periods, which may constitute analyzes of historical series, as the modifications made become a complicating factor while manipulating the database.

In this regard, only in the Readme document of version (D1), an important change that occurred in 2015 in the administrative sphere variable can be observed, which was replaced by the legal nature. This change was in line with Ordinance No. 1,319, of November 24, 2014, which establishes in its art. 6 that "Legal Nature will be the only source to identify the legal-institutional constitution of Health Establishments registered with CNES"[25].

The study by Tedgue et al.[26] is an example of the impact that these changes in variables can cause. The authors, when using CNES data to analyze the distribution of the workforce by legal nature of hospital establishments in Brazil, between 2008 and 2018, needed to subdivide the historical series into two historical periods (from 2008 to 2015 and from 2016 to 2018). This strategy was adopted due to the change established by Ordinance No. 1,319/2014[25] in the variable studied, to avoid confusion between the nomenclatures 'nature' and 'legal nature', which was necessary to guarantee the internal reliability of the study data. The variables that make up an information system are the core for generating reliable information that will support analysis and decision making.

It is important to note that any change in rules regarding variables, without adequate information in the system, may compromise studies that address key public health and population care issues. As an example, we can mention the study by Moreira27 which, during the COVID-19 pandemic, used the CNES to collect care coverage variables, with the aim of understanding the medical-care arsenal in Brazil, aiming at the rational use of beds in Intensive Care Unit (ICU) and lung ventilators. Given the COVID-19 pandemic scenario and the overload caused to the health system, the relevance of the CNES became evident.

The codes that define the types of contracting forms are composed of six digits (000000), hierarchical according to the terminology defined by Consolidation Ordinance No. 1/201724: Form of Contracting with the Establishment or its Maintainer (00); Form of Contract with the Employer (00); Details of the Contracting Method (00). These codes are described in the tables of forms of contracting, which are included in the versions of the CNES (Readme version – D1), which deal with forms of contracting, and in their respective ordinances. Furthermore, these codes are identified in the Domain Tables document (D12), in the CNES Filling Manual (D14) and in the CNES database. In all these documents, it is observed that the codes are compatible with each other, allowing their comparability, even with the increase in the number of codes, due to the diversification of contracting forms. Romero et al.[28], when analyzing the National Live Birth Information System (Sinasc), found different results for some variables, which presented problems regarding the definition of codes.

Thus, the present study demonstrates that the CNES shows weaknesses in the definition of variables related to forms of contracting, even though it presents precise and compatible coding between the documents analyzed, which allows comparability between different time frames.

Language

The Language category refers to the clarity of the language used in manuals and/or documents in order to facilitate understanding in a didactic way when handling the CNES. In this study, the analysis of this category of the

quality dimension of methodological clarity focused on how the forms of contracting were addressed in the selected documents.

The first document to be analyzed in relation to this category was the Readme version (D1), which is a document in Portable Document Format (PDF). This document presents a very technical language, however, it is not very didactic and requires prior knowledge about the CNES. D1 consists of an index, which lists all versions of the CNES and does not have a cover or introduction with instructions for readers to understand what it covers. In the index itself, in most versions, there is a specification of whether it is mandatory or not, but this specification does not appear in all of them, which leaves doubts regarding the mandatory nature of some versions, highlighting a lack of standardization in the document, which can generate confusion for the reader. Still in relation to the Readme version (D1), to illustrate the guidelines, tables and prints of the CNES screen are used, however, there are several prints that are not available for viewing in the document, making it difficult to understand the information.

The Domain Tables document (D12), which aims to present the codes necessary to fill in the data in the CNES, despite fulfilling this purpose, does not provide an index specifying the content of each tab. The absence of this index should be understood as a gap in the language used, which may impair the reader's handling of the document, as understanding what each tab covers will only occur as the reader handles each of the document's approximately 50 tabs.

The CNES Filling Manual (D14) presents clear and didactic language, using illustrations of each item contained in the CNES registration forms, which makes it easier for the reader to understand how to fill out the data in these documents that will feed the system. D14 standardizes technical terminologies and provides a source of consultation on the system and its forms. Annex 28 of the manual contains a table of professional relationships, however, despite having been published in 2006, the terms contained in the types 'other' (scholarship and verbal/informal contract) and in 'self-employed' never constituted relationships with the public administration, which suggests doubts regarding its use.

The creation and publication of manuals does not exclude the need for training to put into practice what these documents recommend, with a view to reducing inefficiency and improving process management. From this perspective, the adoption of manuals by managers can bring agility to the organization, in addition to several other advantages, such as: availability of an instrument and constant source of information; promoting standardization and the use of technical terminologies; constitution of a permanent and updated reference source, etc. However, there are limitations to be considered, including: excessive bureaucratization; the cost of its preparation and maintenance; the excess of information inserted in the manuals, as large manuals tend not to attract users to read them, in addition to requiring the use of clear and didactic language so that there is methodological clarity in the document[29].

Considering other information systems, Medeiros30 pointed out differences in methodological clarity between the manuals of the Brazilian Finance systems (Finbra) and the Public Health Budget Information System (Siops). The manuals and documents published by Finbra are regular in their publications, however, they are not clear and didactic, resulting in ambiguities in the understanding of the document that presents the tables of Finbra domains and values and in the guidelines regarding the composition of the indicators. The author also highlights that prior accounting knowledge is required to understand the information available in the system. On the opposite side, Siops manuals are better evaluated for methodological clarity.

Regarding the language category, it is considered that, of the three documents analyzed, the best result is the CNES Filling Manual

(D14), followed by the Domain Tables document (D12) and the Readme version (D1).

Usability

For the discussion of this category, the new CNES website will be analyzed with regard to the aesthetics and clarity of the system's user interface. The decision to analyze it is justified by the fact that this is considered the official website of the system. It presents a more modern, intuitive and easy-to-understand interface, with four main menus available: a) Quick Access (in which you can consult professionals and establishments); b) Downloads (in which you can download applications, application files, files for other systems, databases and documentation); c) Reports; and d) Legislation (in which it is possible to access the ordinances and regulatory documents of the system). However, in this last menu, the absence of Consolidation Ordinance No. 1/2017 was observed, which provides updates on contracting methods[24].

In addition to the menus described, there are highlighted links in the central area of the website that direct the user to items of interest, such as instructions for registering with CNES, which is one of the highlighted links. Another prominent link in the system's user interface are the 'Establishment Consultation' and 'Professional Consultation' fields, which facilitates the use of this tool by the user.

However, in relation to the 'Professional Consultation' field, it is observed that the presentation of data on the form of contracting still uses the term relationship, a nomenclature prior to that defined by Consolidation Ordinance No. 1/2017[24], which establishes the term form of contracting, highlighting the misalignment between the data presented by the system and the regulations defined in ordinances, as well as the failure to update by the responsible area at the Ministry of Health.

The new CNES website also features four other menus at the bottom of the screen: a) Services; b) Social Networks; c) RSS; and d) About the Site. In relation to these menus, Social Networks stands out, which makes CNES profiles available on Twitter, Facebook, YouTube and Google+. However, all social networks are outdated or have inactive profiles. The use of social networks to share information with users demonstrates an effort to facilitate the use of this system, but requires efforts to keep these profiles updated and active for users.

In this sense, we return to the fact that not all CNES functionalities are available on the new website, something discussed in the accessibility category and which has an interface with the usability category. In this way, the usability of the system ends up being compromised because the user needs to access the previous website, with a different aesthetic and interface. It should be noted that this situation has persisted since 2017, when the new website was announced in version 4.0.00, published in June of that year.

Table 3 summarizes the findings of this study on the categories accessibility, content, variables, language and usability of the CNES quality dimension of methodological clarity.

Table 3. Summary of findings on the analysis categories of the quality dimension methodological clarity of the CNES and the selected documents, considering the approach to the forms of contracting inserted in the system

Category	Findings
Accessibility	– The new website is under restructuring and with some features being implemented and only available on the previous website. – Difficulty accessing documentation because the environment of the new CNES website allows access to documents only through some browsers, having to resort to the CNES Wiki.
Content	Version readme (D 1): the document presents the 184 versions of the CNES made available over the 16 years analyzed, that is, an average of 11 versions each year. This entire volume of system updates points to the need for operators to be constantly updating themselves on the handling of the CNES. Considering all versions, 13 deal with forms of contracting. Attention is drawn to version 3.1.00, which contains a table of forms of contracting without the information being expanded in the legal/normative references with the inclusion of the related ordinance. Domain Tables (D 12): presents the hierarchy of the terminology used to hire health professionals, in accordance with Consolidation Ordinance No. 1/2017, and the codes for the hiring methods are the same as those in the database, which allows the comparability of variables in historical series. SCNES filling manual (D 14): it is the only manual that presents a professional relationship table. Therefore, in relation to the volume of inclusions of new forms of contracting throughout the series (from 11 to 58), it has a low support capacity.
Variables	– In this category, variables related to forms of contracting were evaluated, considering the set of documents and the new CNES website. In this sense, only in document (D1) can the change in the administrative sphere variable be observed, which was replaced by the legal nature in 2015, which can generate difficulties in implementing data tabulation in subsequent years, requiring the attention of researchers and managers when analyzing this data in a historical series.
Language	Version readme (D 1): the document does not present an introduction, starting with an index that presents the 184 versions of the CNES. D1 uses technical language, and the index requires standardization regarding whether the version is mandatory or not. Another negative aspect is the lack of visualization of some prints of the CNES screens, a strategy used to better understand the document. Domain Tables (D 12): has around 50 tabs and does not provide an index specifying the content of each tab. This fact can be considered a gap in the language for the readers' understanding, as they need to access each tab to know its content. SCNES filling manual (D 14): this manual is available in PDF format and presents the CNES forms in a didactic way through illustrations, which makes it easier for the reader to understand how to fill in data. However, having been published in 2006, it is out of date. Furthermore, the professional relationship table contains types of contracting forms that have never constituted ties with the public administration.
Usability*	– The new CNES website is more intuitive and more didatic. It has profiles on social networks, however, they are outdated. – Not all of the website's features were ready, a problem that has persisted since 2017. – Information about professionals generated using the older terminology (relationship) rather than the method of hiring.

Source: Own elaboration.

*Adapted from Morais et al.[21].

Final considerations

The quality of information is *sine qua non* for the production of health knowledge and for the implementation of public policies that promote equity and the right to health. Each study involving SIS reflects the search for its improvement, whether using it as a source of data or presenting criticism and potential. Thus, the findings of research with the CNES are no exception to this rule.

From this perspective, in general, when considering all categories of analysis (accessibility, content, variables, language and usability), it is clear that the CNES needs better attention to the quality dimension of methodological clarity, taking into account the handling of the ways of hiring health professionals included in the system.

It is considered that the categories proposed for the analysis of the quality dimension of methodological clarity need to be validated by the scientific community through their use in other studies that address other information systems, or even the CNES from other perspectives.

Despite the relevance of this quality dimension, methodological clarity has been little addressed, demonstrating the potential of the findings of this study to support discussions between managers, technicians and bodies responsible for improving this system, considering the methodological clarity of the CNES.

Quality information is information that is understood and reproduced clearly, which is in line with the search for more democratic management, aimed at the common good of citizens and health professionals involved in assisting the population. In this sense, the search for the availability of quality information must be the driving force behind the improvement of information systems – and it was with this aim that the present study intended to provide contributions regarding the quality dimension, methodological clarity, considering the approach to forms of contracting of health professionals included in the CNES.

Collaborators

Coelho JGAM (0000-0002-4678-1071)*, Medeiros KR (0000-0002-7518-4137)* and Feliciano M (0000-0002-0845-2461)* contributed to conception, planning, analysis and interpretation of data; for writing the work and/or critical review for important intellectual content, and for approval of the final version of the manuscript. Damázio SLC (0000-0003-2851-5076)* and Santos CR (0000-0001-8367-7006)* contributed to conception and planning; for critical review for important intellectual content, and for approval of the final version of the manuscript. ■

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