

## RESEARCH ARTICLE

## Open access initiatives in the fight against pandemic open data and intellectual property in the dissemination of information and knowledge

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### ABSTRACT

**Introduction:** With the pandemic, the number of research on COVID-19 has grown at a rapid pace, forcing the scientific communication system to improve in the face of the demands of speed and efficiency in the dissemination of scientific results, making Open Science a key point to achieve the end of this global crisis. **Objective:** This study aims to analyze initiatives Transparência Covid-19 and Open Covid Pledge, bringing to light the discussion of open data and intellectual property in the advancement of science, scientific collaboration, and the socialization of knowledge. **Method:** Methodologically, this is a descriptive research with a qualitative approach, carried out through a bibliographic review (from 2010 to 2021) and documentary research, in order to provide a critical analysis of open data and intellectual property. **Results:** The fight against the pandemic highlights the importance of initiatives, which seek to assess the quality of transparency of open data made available by public agencies, as well as to promote social participation, monitoring and encouraging government actions contributing to the development and conduct of public policies. The sharing of PI has a fundamental role when it is placed as an incentive instrument and not as a barrier to access to information and data for technological innovation and scientific advancement. **Conclusion:** We conclude, that the discussion about open data and PI, through a look by Open Science, shows us the importance of these in confronting the pandemic about its barriers and uses for the Health area and for society in the sense of socialization and sharing of knowledge.

### KEYWORDS

Open Access. Open data. Intellectual Property. Covid-19 Transparency. Open Covid Pledge.

## Iniciativas de acesso aberto no combate à pandemia dados abertos e propriedade intelectual na disseminação da informação e conhecimento

### RESUMO

**Introdução:** Com a pandemia, o número de pesquisas sobre COVID-19 cresceu em um ritmo acelerado, obrigando o sistema de comunicação científica a aperfeiçoar-se diante das exigências de velocidade e eficiência na disseminação dos resultados científicos tornando a Ciência Aberta um ponto chave para alcançarmos o fim desta crise mundial. **Objetivo:** O presente estudo tem como objetivo analisar as iniciativas Transparência Covid-19 e *Open Covid Pledge*, trazendo à luz a discussão sobre dados abertos e propriedade intelectual no avanço da ciência, da colaboração

científica e da socialização do conhecimento. **Método:** Trata-se de uma pesquisa descritiva com abordagem qualitativa, realizada por meio de revisão bibliográfica (2010 a 2021) e pesquisa documental, a fim de proporcionar uma análise crítica sobre dados abertos e propriedade intelectual. **Resultados:** A luta contra a pandemia destaca a importância de iniciativas, que buscam avaliar a qualidade da transparência de dados abertos disponibilizados pelos órgãos públicos, como também promover a participação social, fiscalizando e estimulando ações governamentais contribuindo na elaboração e condução de políticas públicas. O compartilhamento da PI tem um papel fundamental quando se coloca como instrumento de incentivo e não de barreira ao acesso a informações e dados para inovação tecnológica e avanço da ciência. **Conclusão:** Concluímos, que a discussão sobre dados abertos e PI, através de um olhar pela Ciência Aberta, nos mostra a importância destes no enfrentamento à pandemia sobre suas barreiras e usos para a área da Saúde e para sociedade no sentido de socialização e compartilhamento do conhecimento.

#### **PALAVRAS-CHAVE**

Acesso Aberto. Dados Abertos. Propriedade Intelectual. Transparência Covid-19. Open Covid Pledge.



**JITA:** ED. Intellectual property: author's rights, ownership, copyright, copyleft, open access.

## 1 INTRODUCTION

Since March 2020, we have been living amidst a pandemic caused by a new type of coronavirus (from the *Coronaviridae* family), identified as SARS-CoV-2 or new coronavirus, which, just as other genera of coronavirus, causes as a main complication severe acute respiratory syndrome. Later, but still in 2020, the World Health Organization (WHO) established the term *Coronavirus Disease 2019* (COVID-19) as the official nomenclature to refer to this new disease (ZENG; HONG; CLUNIS; HE; COLADANGELO, 2020). Virtually all spheres of society were affected worldwide, creating an unprecedented crisis that has been difficult for national public health systems to control.

Among its consequences, in addition to the several lives lost, a new perception of the world and new ways of behaving have become essential to confront the pandemic context, reverberating in biomedical and epidemiological areas as well as causing social, economic, political, cultural, and historical impacts, especially in how we do and communicate science in the search to obtain and identify relevant research results in a short period of time for socioeconomic and, mainly, public health decision-making.

We start this work based on that consequence, which echoes in scientific communication in all fields of study, such as in Information Science (IS), and which consists of a discussion point that is not actually new, considering that new forms of communication between scientists have been debated since the 1970s. This discussion originated in the Open Access Movement with the purpose of providing access to information free of cost and any other type of restriction that would make that access and its return to society impossible.

Over the years, with the development of the Internet and the expansion of the access to information, new scientific communication practices started being discussed (open data, citizen science, open-source, scientific social networks, among others), originating Open Science, which goes beyond accessible publications and data, becoming an umbrella term that encompasses all these practices with the objective of promoting, designing, accomplishing, and communicating research results and data. It relates the principles of this opening and collaboration with the several scientific processes of knowledge production (organization, sharing, and reuse) (SILVA; SILVEIRA, 2019). Thus, we have a socialization of science, making it more collaborative, transparent, and sustainable.

Therefore, Open Science allows that scientific information, data, and results be more widely accessible, also allowing their reuse and redistribution in society; that is, it allows that science be connected to the needs of the people. This, in turn, provides the dissemination of the promoting and the learning from Science, encouraging scientists, policy makers, and citizens to work together for technological advancement and innovation, between and within countries, having as a key point the return of scientific results and data to society, guaranteeing the people's right to information and science (UNESCO, 2021).

With the pandemic, the number of studies about COVID-19 increased at a fast pace, in an unprecedented scientific race that made it essential that information be available to everyone, so that the fight against the disease could advance. This forced the scientific communication system to improve itself, even if abruptly, given the demands for celerity and efficiency in the dissemination of scientific results (LARIVIÈRE; SHU; SUGIMOTO, 2020).

Together, the scientific community has reinforced its appeal to publishers and funders for the application of open access policies, for the availability of research results and data, especially those related to COVID-19 (BERMÚDEZ-RODRÍGUEZ; MURAROA; SPATTIA; MONACO, 2020). In this pandemic context, the debate on Open Science became even more evident and important.

Thus, to monitor the evolution of the pandemic and to develop measures to combat COVID-19 in both its clinical and social effects, the WHO started the *Global research on coronavirus disease COVID-19* initiative, which aims to bring together scientists, scholars, and health professionals from around the world to accelerate the research process on COVID-19, thus seeking to boost the importance of Open Science in the pandemic context.

Several other open initiatives have been created since then, involving a multidisciplinary approach to obtain and disseminate information and data related to COVID-19. The objective is to facilitate society's access to science and to encourage the formation of a global collaboration network for doing and communicating science, enabling studies in all academic areas, especially in that of health.

With the pandemic context and with how essential Open Science has become for science to innovate quickly and to disseminate research results, this article has the objective of analyzing two open initiatives – Transparência COVID-19 and Open Covid Pledge – to shed light on the discussions about the importance of open data and intellectual property (IP) in the advancement of science, of scientific collaboration, and of the socialization of knowledge, especially in the pandemic context.

Methodologically, this is a descriptive research with a qualitative approach that aims to perform a critical analysis of open data and IP by relating the analyzed initiatives and, consequently, the collaboration between researchers and the dissemination and access to information and knowledge in the context of the COVID-19 pandemic. The analysis will be done through a literature review (on open data, COVID-19, and intellectual property) with a time frame ranging from 2010 to 2021, and through documentary research (in the websites of each initiative). Structurally, the work consists of sections that address the analyzed initiatives, discussing their characteristics and relationship with Open Science. Subsequently, the relationship between the two initiatives and how they can be complementary are critically discussed, bringing to light the discussion on open data and IP and providing the intersection between Open Science and scientific communication. Finally, in the last section, we present a rundown of the elements present in the research and the conclusions about the theme.

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## 2 OPEN ACCESS INITIATIVES IN THE FIGHT AGAINST THE PANDEMIC

There is currently an ocean of information and data being generated to try to answer questions arisen with the pandemic and to meet the need for the quick dissemination of epidemiological and biological information about COVID-19. In this process, as previously mentioned, the scientific community and society's reaction reinforced the importance of Open Science, directly affecting all fields of study. Thus, the effective dissemination of research results is essential for them to be evaluated, revised, expanded, and made available, and, given the pandemic context, we have an accelerated progress in the spread of the disease and in the availability of data and information about that disease, which must be consistent and accessible to all (SILVA; D'ANDREA, 2020).

Therefore, organizing and representing information and knowledge to make them accessible – that is, the urgency for the quick sharing of information – is of fundamental importance for scientific progress. Thus, at this speed of publication, scientific cooperation emerged spontaneously in an immense collaborative network that links a large number of open initiatives from public agencies, non-governmental organizations, companies, universities, and laboratories focused on the fight against the pandemic, aiming to bring information, resources, and data “from” and “to” research.

As an example, we present Agência USP de Gestão de Informação Acadêmica’s hub of information and resources (2021), which has over 30 initiatives and is affiliated to the Universidade de São Paulo. It aims to promote Open Science through the production and use of information for the development of society. As a general overview, we organized those information and resources in Table 1 with some examples of initiatives. It is important to note that this list does not include all open access information sources in the fight against the pandemic, but it is one of the few institutions that provides such observation:

**Table 1.** L List of open access information sources

INITIATIVES	DESCRIPTION
COVID-19 Open Research Dataset	Database with 57,000 entries, including 41,000 articles on COVID-19 and on related coronaviruses; serves as a basis for data mining by machine learning techniques to answer a set of open-ended questions about COVID-19.
Global research on coronavirus disease COVID-19	WHO initiative that aims to bring together scientists and health professionals from around the world to accelerate the process of researching and developing new norms and standards to contain the spread of the coronavirus pandemic.
COVID-19 Knowledge Centers	Collection of COVID-19 links.
Covid-19 Data Sharing/BR	FAPESP initiative in cooperation with USP and, initially, with the participation of the Instituto Fleury, Hospital Sírio-Libanês, and Hospital Israelita Albert Einstein, with the objective of providing data related to COVID-19 that can contribute to research on this topic.
Transparência COVID-19	The Índice de Transparência da Covid-19 is an initiative by OKBR to assess the quality of data and information related to the new coronavirus pandemic published by the Union and by Brazilian states on their official portals.
Nextstrain	Open-source project to harness the scientific and public health potential of pathogen genome data.
Coronavirus (COVID-19)	Information resources maintained by the Centers for Disease Control and Prevention of the US Department of Health and Human Services.
LitCovid	Curated literature center to track up-to-date scientific information about the coronavirus.
Unesp Coronavírus	Website that brings together news, bulletins, press releases, videos, and updates on research carried out by the university Unesp.
Unicamp Coronavírus	Website dedicated to fighting the pandemic; it presents data, information, recommendations, assistance, and updates on research carried out by the university Unicamp.
Diretório Coronavirus	Directory of open access scientific information sources on the coronavirus, created and maintained by IBICT, in collaboration with the UNESCO office in Brasília.
NIH Clinical Trials	Database of publicly and privately funded clinical studies conducted worldwide.
Open COVID Pledge	International coalition of scientists and lawyers that urges authors to make all intellectual property under their control available to help end the COVID-19 pandemic.
COVID Evidence	Continuously updated database of evidence available around the world on interventions with respect to COVID-19.

Source: adapted from Agência USP de Gestão de Informação Acadêmica (2021).

Every day new items are added to this list. In view of the adequate development of the research, this article will deepen its discussion through the selection of two initiatives: Transparência COVID-19 and the Open Covid Pledge.

The selection of these two initiatives is due to the fact that Transparência COVID-19 puts itself as a protagonist in the analysis of the quality of the data made available by the Brazilian states and government; that is, it encompasses the production of data and information in the public sphere, making them available for search. The Open Covid Pledge initiative, on the other hand, gains importance given that its purpose is international cooperation, to encourage researchers, scientists, and scholars to make all IP under their control available, with the support of large companies and associations in the public and private spheres. Thus, the initiative makes available to society, under certain licenses, data and information generated by and for research. With the analysis of these two initiatives, the objective is to encompass the national and international spectrums, public and private, in the fight against the pandemic.

### 2.1 COVID-19 transparency

The first open initiative to be analyzed is the one that operates nationally, Transparência COVID-19. Such initiative had its start on April 3, 2020, through Open Knowledge Brasil (OKBR), a non-profit civil society organization linked to the Open Knowledge Foundation, placing itself as its branch within Brazil.

OKBR, also known as Rede pelo Conhecimento Livre (Network for Free Knowledge), was made official in 2014, according to its statute, and stands as a private law legal entity that is non-profit and that holds no political-partisan or religious aspect. Its initial purpose in Brazil is to face questions related to the opening of information. Its mission is to use and develop civic tools, projects, public policy analysis, and data journalism to promote free knowledge and reach all areas of society, working as a platform to launch projects and to provide initiatives with guidance, resources, and planning to obtain funding and establish partnerships (OPEN KNOWLEDGE BRASIL, 2019; 2020a).

With the premise of free knowledge for all, OKBR has three main objectives, as emphasized in its statute (OPEN KNOWLEDGE BRASIL, 2019, p. 1, our translation):

- a) To promote freedom of access, use, creation, recombination, study, and dissemination of knowledge;
- b) To promote and facilitate the exercise of this freedom;
- c) To oppose any type of restriction to this freedom (be it legal, technical, public, or private), observing the balance between individual rights.

Such objectives are reflected by their axes of activity: Advocacy and Research; Civic Innovation; and Data School. These axes, in turn, are reflected in the initiative's actions, which have the purpose of stimulating society's engagement in the search for open knowledge and information by promoting and using open platforms and sources and by strengthening legal, research, and teaching support (citizen science) for society in the fight against corruption, as well as defending digital rights, transparency, and democratic governance (monitoring of public policies) (OPEN KNOWLEDGE BRASIL, 2020a).

Thus, open data is fundamental in OKBR's structure, and it is defined as:



Open data are data that can be used, reused, and redistributed freely by anyone, being subject, at most, to the requirement of attribution of source and of being shared under these same rules (OPEN KNOWLEDGE FOUNDATION, 2021, *online*, our translation).

This definition carries some important points of discussion, namely availability and access. The data must be made available as a whole, allowing its reuse and redistribution in an interoperable way with other data sets, as well as with universal participation, meaning that the entire society must be able to use, reuse, and redistribute it (OPEN KNOWLEDGE BRASIL, 2019; OPEN KNOWLEDGE FOUNDATION, 2021).

Based on this brief description of OKBR, we direct our eyes towards *Transparência COVID-19*. In early April 2020, one month after the start of the pandemic, with isolation measures being adopted by Brazilian states, and the country counting more than 10 thousand cases of COVID-19, OKBR launches the *Índice de Transparência COVID-19* (Transparency Index COVID-19 – ITC-19), a synthetic indicator that is established as the first phase of the *Transparência COVID-19* initiative. Its objective is to assess the quality of data and information (epidemiological bulletins and newsletters, reports, and other types of data dissemination) made available by states, capitals cities, and the federal government on their official portals about the pandemic.

Thus, the initiative aims to:

[...] point out viable ways for capital cities, states, and the federal government to improve the dissemination of data through the standardized publication of information about the pandemic. In the current context, these data continue to be decisive not only for the exercise of social control, but for improving policies that will save lives. (OPEN KNOWLEDGE BRASIL, 2021a, p. 5, our translation).

Given that purpose and how essential the transparency of government data is, we can observe that the access to those data becomes a tool to fight the COVID-19 pandemic, as it provides consistent and updated evidence on the public health situation in the national territory, helping monitor the evolution of the disease.

To achieve this purpose, ITC-19 preferentially analyzes fixed sections and hotspots dedicated to the publication of information about the new coronavirus (epidemiological bulletins, as well as panels, reports, and other types of data dissemination) in official portals of Brazilian states, capital cities, and of the federal government. The focus on official portals is due to the fact that they are the initial point of contact with the population, and that, when standardized and organized, they facilitate the search for information and the population's access to it (they are still the most accessible and democratic form of communication and of data and information sharing offered by public bodies) (OPEN KNOWLEDGE BRASIL, 2020a; 2020b). Of course, currently, social media and applications stand as a primary source of great value in the people's search for information, especially in this context of information overload; however, these communication channels often lack updating and control, which can generate some noise between those who inform and those who want to be informed, in addition to the care taken with the protection of personal data in their publications.

The initiative, in turn, places itself within its objective, with the intention of providing the (re)organization of official portals to make them clearer and more accessible in order to facilitate the dissemination of information; thus, *Transparência COVID-19* makes itself available to public bodies to help in the development of open data and in the protection of personal data, both in relation to pandemic data and regarding the advancement of public policies (OPEN KNOWLEDGE BRASIL, 2021a).

Methodologically, ITC-19 collects and verifies open data from the latest journal publications released by the official portals of health and control agencies in the municipal, state, and federal levels. The data is analyzed in three dimensions, which are, in turn, formed by several subdimensions that bring together a set of aspects that are assessed individually. According to the *Nota Metodológica 3.0* – the most recent one published by Open Knowledge Brasil (2021a, p. 6) –, these dimensions are composed as follows:

- a) **Content:** evaluates parameters that help the production of more in-depth analyses of the spread of the virus. This dimension consists of the subdimensions (weight 1 in the composition of the index): Cases (notifications, deaths, severe acute respiratory syndrome – SARS, and main etiologic agents); Case Profile (age, gender, preexisting diseases, race/color, indigenous ethnicities, health professionals, population deprived of liberty); Vaccination (doses applied, priority group, vaccination coverage of priority groups, vaccination coverage of the general population); Vaccination Profile (gender, race/color, indigenous ethnicities); Infrastructure (tests applied, tests available, doses distributed, doses received and acquired, syringes and needles available, operational clinical and ICU beds/general, occupied clinical and ICU beds/general, operational clinical and ICU beds/exclusive for Covid-19, occupied clinical and ICU beds/exclusive for Covid-19);
- b) **Granularity:** evaluates the details of the data released by the authorities. This dimension consists of the subdimensions (weight 2 in the composition of the index): Database (case microdata, vaccination microdata); Location (Covid-19 cases by neighborhood/district, vaccination by municipality);
- c) **Format:** evaluates how the data were made available, that is, how they are accessed, read, and shared. This dimension consists of the subdimensions (weight 3 in the composition of the index): Access (visualization/cases, visualization/vaccination, navigation); Quality (open format/cases, open format/vaccination, methodology).

In the index, each dimension is assigned grades on a scale from 0 to 100 (zero represents the least transparent and 100 the most transparent) based on the grades of its subdimensions, for the constitution of the final grade, which will be represented on the ITC-19 panel. Thus, in each evaluation round, the initiative seeks to discuss the level of transparency of the data released by the public bodies analyzed in order to provoke and encourage them to improve the access to and organization of the data, especially in how they are made available (OPEN KNOWLEDGE BRASIL, 2020a).

This is due to the fact that, right after its kickoff, the ITC-19 became a guide for public managers due to its methodological quality, considerably boosting the transparency of data and information about the pandemic in all Brazilian states and in the federal government. Currently, the *Transparência COVID-19* initiative is in its third phase (Table 2), bringing into its structure not only the ITC-19 index, but also two other initiatives, the “Bed Monitor” and the “Vaccination Monitor” panels, which aim to analyze the data published by the Brazilian Department of Health. These three initiatives together offer a panorama rich with assessments to monitor the quality of the data and information made available by states and the federal government about the pandemic (OPEN KNOWLEDGE BRASIL, 2020a; 2020b; 2021a).



Table 2. Phases of the Transparência COVID-19 initiative

STAGE	DIMENSIONS/INITIATIVES	PERIODICITY	ALTERATIONS
Phase 1 (1.0)	3 dimensions (13 subdimensions)		Phase 1 (1.0)
ITC-19	Weekly	Public consultation to improve the criteria after eleven rounds.	ITC-19
Phase 2 (2.0)	3 dimensions (26 subdimensions)		Phase 2 (2.0)

Source: the authors.

The evolution between the phases took place according to the increase in the transparency of the analyzed public bodies. In phase 1, after eleven rounds of evaluations (eleven weeks), the average transparency score of the states and of the federal government tripled, making OKBR realize that there was a need to “raise the bar” of the analyses, improving the quality of pandemic data collection and transparency. To do so, the dimensions had their subdimensions expanded and updated, and the initiative started analyzing and evaluating data from Brazilian capital cities, entering its second phase in July 2020 (OPEN KNOWLEDGE BRASIL, 2020b).

After eight more rounds of evaluation, now performed monthly, OKBR once again observed the need to raise the quality of its analyses, given that the analyzed bodies had already reached an average level of transparency with their data. As a result, in April 2021 the initiative entered its third phase, in which the dimension criteria were reviewed again, keeping the index comprehensive, but still accurate and operable. And in view of the beginning of vaccination, a vaccination monitor was added to assess data on this new demand, which is essential to end the pandemic. Thus, the initiative brings not only bulletins with the results of the ICT-19, and the bed and vaccination monitors, but also studies with different levels and scopes of analysis (OPEN KNOWLEDGE BRASIL, 2021a).

Given the persistence of the sanitary crisis in Brazil and the need to continue advancing in the transparency of information related to the pandemic, and to the fight against it, OKBR continued to improve the quality of its methodological criteria. To do so, it maintains and seeks contact with other open access initiatives, to share methods of data and information collection and availability, such as with the Open Covid Pledge. Such partnerships aim to produce a collective effort in the pandemic to consolidate the transparency of open government data in Brazil, which is essential for studies not only in the areas of Health, but also in several other areas, in view of the impacts of COVID-19 in the social, political, economic, and cultural spheres.

### 2.2 Open Covid Pledge

Continuing the analysis, we now observe the second initiative to be analyzed, now in an international context, the *Open Covid Pledge*. It is led and administered by the Program on Information Justice and Intellectual Property of the American University Washington College of Law, an internationally recognized academic and research program in information law.

This initiative stands as an international coalition of scientists, scholars, researchers, and lawyers, with the objective of encouraging authors, organizations and institutions (public and private), and companies to voluntarily share IP patents and copyrights under their control with the whole society. Therefore, it seeks to accelerate and encourage the rapid development and implementation of diagnoses, vaccines, therapies, equipment, and software solutions

related to Health to combat the public health crisis caused by the pandemic (OPEN COVID PLEDGE, 2020a).

To better understand the purpose of this initiative, we used the IP concept established by the World Intellectual Property Organization’s convention (WIPO), which includes, according to Jungmann and Bonett (2010, p. 21, our translation):

The sum of rights relating to literary, artistic, and scientific works, interpretations and performances by performing artists, phonograms and broadcasting, inventions in all fields of human activity, scientific discoveries, drawings and industrial models, industrial, commercial, and service brands, as well as commercial firms and trade names, protection against unfair competition and all other rights inherent to intellectual activity in the industrial, scientific, literary, and artistic fields.

Thus, this set of rights over immaterial goods that result from the human intellect and have economic value, is established in accordance with the initiative so that the IP owner offers a specific non-exclusive and royalty-free Open Covid license to use, import, reproduce, adapt, translate, distribute, perform, display, modify, and create derivative works of any technology related to products, services, compositions of matter, machines, manufacture articles, and processes that can assist in the diagnosis, prevention, containment, and treatment of COVID-19, seeking to end the pandemic (OPEN COVID PLEDGE, 2020a; 2020c).

To implement the Open Covid license and make IP available, one must follow three steps, as per the guidelines of the Open Covid Pledge (2020c, online):

- a) **Make a public commitment:** make available IP relevant to COVID-19 free of charge with the release of a public statement given by the organization evidencing its commitment to the initiative;
- b) **Implement the commitment:** implement the commitment through one of the available licenses, which detail the terms and conditions under which the IP is made available;
- c) **Fulfill the commitment:** send the Open Covid Pledge the link to the commitment and license on your website, with the organization’s contact and logo, so that the shared IP is available and accessible to all.

By directing its attention to the implementation of this commitment, the initiative makes available three types of standard licenses, called Open Covid License (OCL), developed by a legal team for organizations and individuals who want to simply and immediately implement their IP (OPEN COVID PLEDGE, 2020a; 2020b).

The licenses (Table 3) are differentiated based on their version and by the addition of the letters “PC”, to refer to patent rights and copyrights, allowing any organization or person to use the IP made available.

**Table 3.** Types of Open Covid Licenses (OCL)

LICENSE	SCOPE	SPAN	USES
OCL-PC v1.0	Patent rights	From December 2019 until 1 year post-pandemic, as declared by WHO.	Used to diagnose, prevent, contain, and treat Covid-19.
OCL-PC v1.1	Copyright	From December 2019 until 1 year post-pandemic, or January 1 <sup>st</sup> , 2023.	Used to diagnose, prevent, contain, and treat Covid-19.

OCL-P v1.1	Patent rights	From December 2019 until 1 year post-pandemic, or January 1 <sup>st</sup> , 2023.	Used to diagnose, prevent, contain, and treat Covid-19.
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Source: adapted from *Open Covid Pledge* (2020b).

Given the standard Open Covid Licenses, we can observe that the only material difference between OCL-PC v1.0 and OCL-PC v1.1 is that OCL-PC v1.1 has a fixed expiration date (the licensor adopting version v1.1 can always extend the license voluntarily). The purposes for which the public can use them are the same in the three licenses. It is worth mentioning that, if only the copyright is to be made available and licensed, the initiative recommends using the Creative Commons international license, attribution CC BY 4.0 or CC0 (OPEN COVID PLEDGE, 2020b). Thus, in addition to the Open Covid Licenses developed by the initiative and depicted in Table 3, it also accepts two more categories of licenses for the implementation and support of the commitment:

- a) **OCL-compliant licenses:** licenses that provide a set of permissions that have been determined as OCL-compliant;
- b) **Licenses that are alternative to OCL:** licenses that do not fit as compatible but are still consistent with OCL’s commitment.

Hence, we can see the reach that the initiative intends to achieve by bringing the possibility of supporting its objective not only through licenses developed and elaborated by their own team, but also with compatible and alternative licenses that fit into its purpose of making IP available for scientific sharing in the pandemic.

Among the licenses compatible with OCL, Creative Commons’ CC BY 4.0 and CC0 1.0 stand out. The first one allows the sharing and adapting of the material for any purpose, even if commercial, requiring only that there be an attribution to the original author. The second consists of a public domain license, so that one can copy, modify, distribute, and perform the work, even for commercial purposes, without asking for permission (CREATIVE COMMONS, 2021b; 2021c). Another example of a compatible license is the MIT License, created by the Massachusetts Institute of Technology and directed to the use of open-source software without restriction, including, with no limitation, the rights to use, copy, modify, merge, publish, distribute, sublicense and/or sell copies of the software, allowing the people to whom the software is provided to do so as well (OPEN SOURCE INICIATIVE, 2021).

Regarding alternative licenses, CC BY-SA stands out. It allows the sharing and adapting of the material, requiring that the contributions be distributed under the same license used for the original work, the GPL (General Public License), which is used for free software programs of the GNU system, which, in turn, has created several free software and consequently promoted the dissemination of the philosophy of free software (FREE SOFTWARE FOUNDATION, 2020; CREATIVE COMMONS, 2021a).

The initiative allows, in addition to these three categories of licenses, the possibility of researching and seeking IPs that have already been committed to its pledge, through the platform IPscreeener. Currently the Open Covid Pledge commitment is signed by large companies and organizations such as Intel, Facebook, Amazon, IBM, Sandia National Laboratories, Hewlett Packard, Microsoft, Uber, Open Knowledge Foundation, Massachusetts Institute of Technology, and Mozilla, which made part of their IP available through one of the Open Covid Pledge licenses.

Among the organizations that align themselves to this commitment, the Open

Knowledge Foundation stands out. It originated OKBR and, consequently, the initiative Transparência COVID-19, the first one observed here. OKBR stands as one of the organizations that supports and subscribes to the commitment of making their IP available. It is an example of joint effort in the fight against the pandemic, and we stress the importance of observing such initiatives as complementary lines to disseminate and unite information and data in the socialization of knowledge not only during the pandemic, but as an advancement in how we do and communicate science.

### 3 CAN OPEN DATA AND THE SHARING OF INTELLECTUAL PROPERTY SAVE LIVES?

After discussing the two initiatives and observing their characteristics in relation to open data and IP in the context of the pandemic, it is observed that themes related to health aroused greater interest in society and started to systematically integrate media content, both in written and spoken format. At the same time, the number of studies grew at an accelerated pace. This new context is enhanced by the fact that news from around the world is constantly updated, revised, and shared, providing users with an overload of new information (LARIVIÈRE; SHU; SUGIMOTO, 2020).

This information overload can be translated, according to Fiorillo and Gorwood (2020), as “infodemic”, a term that means a significant increase in the volume of information being disseminated, be that information true or false. We are facing, thus, two global crises: the one caused by the virus, and the one caused by information. In this infodemic, there are conspiracy theories and fake news being disseminated even by governments and heads of state, regarding the origin, treatment, symptoms, and contagion of the disease. This, in turn, generates an ocean of confusing and distorted data and information, which does a disservice to the fight against the pandemic in both the social and the public health spheres (DOMINGUES, 2021).

Such context is enhanced by the fact that in Brazil there is still heterogeneity in the collection and dissemination of data and information, as highlighted by Open Knowledge Brasil (2021a), generating difficulties in the development of research, public policies, and in the possibility of access for the Brazilian society as a whole, especially in the case of government open data, which are essential in the fight against the COVID-19 pandemic.

Government open data can be defined as:

[...] a methodology for publishing government data in reusable formats, aiming to increase transparency and the citizen’s political participation, in addition to generating several applications developed collaboratively by society (GOVERNO FEDERAL DIGITAL, 2019, *online*, our translation).

Following this definition, the public administration realized through Open Government (OG) holds the following principles (CONTROLADORIA-GERAL DA UNIÃO, 2020, *online*):

- a) **Transparency:** the information about government actions and activities is open, accessible, and meets the basic standard of open data;
- b) **Accountability:** use of rules and mechanisms that bring out the responsibilities assigned to them;

- c) **Citizen participation:** mobilization of society to debate, collaborate, and propose contributions to promote a more effective and transparent government;
- d) **Technology and innovation:** related to the importance of new technologies in fostering innovation, providing access to technology and expanding society’s capability to use it.

In the concept of open government data, as well as in the principles of an OG, there is focus on the citizen. This takes place, as emphasized by Silva (2010, p. 27, our translation), in the governments’ purpose of making their data and information available so that “collective intelligence can create ways to work with that information that are better than what the governments themselves could do”. In Brazil, as previously emphasized, there is no standardization for the collection, availability, and access to data, which, even if open, still carry some obstacles to the population’s access to it, especially when it comes to the format in which data are made available (visualization, quality, sharing), even as part of the Open Government Partnership – an international initiative that aims to spread and encourage government practices related to transparency, social participation, and access (VAZ; RIBEIRO; MATHEUS, 2010; SILVA; SANTOS; CHAVES; VAZ; BALANIUK, 2014).

In the pandemic context, this lack of transparency in government data was even more visible when analyzing the Transparência COVID-19 initiative, especially due to the infodemic present even around heads of state, with the dissemination of fake news. However, at the same time, it revealed to us the efforts of institutions in the quest to provide and encourage greater transparency in open data, especially open government data.

Thus, the fight against the COVID-19 pandemic as well as against the infodemic highlights the importance of initiatives such as OKBR, which seek not only to assess the quality of transparency of the open data made available by Brazilian states and the federal government, but also to promote social participation and citizen empowerment, inspecting and stimulating government actions at all levels and contributing to the development and direction of public policies.

In addition, OKBR’s initiative stands out in the sense that it observes open data as a potential tool to save lives in the pandemic, as the dimensions observed and analyzed by ITC-19 are based on the eight principles of open data (Table 4), aggregating a high value to the socialization and transparency of data and information in the Brazilian territory.

Table 4. Principles of open government data

PRINCIPLE	DESCRIPTION
Complete	All public data are made available. Data are electronically recorded information, including, but not limited to, documents, databases, transcriptions, and audiovisual recordings. Public data are data that are not subject to valid limitations of privacy, security, or access control, regulated by statutes.
Primary	The data are published in the same way they were collected at the source, with the finest possible granularity, and not in an aggregated or transformed format.
Current	Data are made available as quickly as necessary to preserve its value.
Accessible	Data are made available to the widest possible audience and for the most varied purposes possible.
Processable by machine	Data are reasonably structured to enable automated processing.
Non-discriminatory access	Data are made available to all, with no need for identification or registration.
Non-proprietary formats	Data are made available in a format over which no entity has exclusive control.



License free	The data is not subject to copyright, trademark, patent, or trade secret regulations. Reasonable privacy, security, and access control restrictions may be permitted, as regulated by statutes.
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Source: Silva, Santos, Chaves, Vaz e Balaniuk (2014, p.25, our translation).

Following these principles, *Transparência COVID-19* seeks to point out viable ways for capital cities, states, and the federal government to improve the dissemination of data, going beyond their simple evaluation, but also helping and encouraging the development of standardized forms of publishing information about the pandemic through training, lectures, and studies. This approach also brings out another important point within the role played by open data, and not only in the pandemic context, which is its interoperability.

Interoperability (which allows for different components to operate together) is essential for the main practical benefits of “opening” data to be realized: the increased capability to combine different data sets and, therefore, to develop more and better products and services for society. Thus, the main point is to enable a given dataset to be freely mixed with other open datasets (OPEN KNOWLEDGE FOUNDATION, 2021).

The importance of interoperability can be exemplified by another initiative recently devised by OKBR, the “Querido Diário” (Dear Diary), launched on July 20, 2021. This initiative seeks to bring together, on a single platform and interoperably, and through the use of artificial intelligence, all information contained in official Brazilian city journals. The information is to be made available in an open and user-friendly format for the free consultation of civil society (OPEN KNOWLEDGE BRASIL, 2021b).

In this context, there is a need to continue improving the sharing of data and information, even after the end of the pandemic, in order to improve and encourage the production, transparency, sharing, and understanding of data in academia, in the media, and among the population in general, in order to heat up the debate about the importance of Open Science practices.

Advancing in the analyses in the pandemic scope, when observing the Open Covid Pledge initiative, we can see that IP has a fundamental role when it is understood as an instrument for the incentive *of*, and not as a barrier *to* the access of information and data for technological innovation and for the advancement of science, considering its ability to innovate quickly and to spread results.

The development of licenses specific for sharing patents and copyright with the whole society is a way to accelerate and encourage the rapid development of diagnoses, vaccines, therapies, equipment, and software to fight the pandemic. However, it is also noticeable that such a measure should be considered in the long term, and not only from the perspective of the area of health, but from all others that are directly involved in the development of society's well-being.

Thus, the rights related to IP in scientific publication must be rethought, especially in extraordinary situations like the one we are currently experiencing, since a large volume of public resources is allocated to support research in the pharmaceutical and health area. The barriers related to the availability of IP – a protection for companies to direct technical and financial resources to the development of new solutions – may hinder the dissemination of technologies and limit the production and access to medicines and other products in these segments (CHAMAS, 2020; ODY, 2021).

The Open Covid Pledge stands as a private initiative that seeks to deconstruct such barriers, even if only during the pandemic period, by bringing in its core the principles of sharing and of collaboration, falling in line with aspects related to Open Science. Thus, big companies such as Amazon and Intel, among others, are encouraged to make their IP available



with the purpose of ending the pandemic, as well as is encouraged any person or institution (public and private) to share their IPs in the fight against COVID-19, in a global collaborative work (OPEN COVID PLEDGE, 2020a).

Here we also identify the importance of the role played by the public sector regarding IP rights and sharing, as it is the State that protects the creativity of authors and inventors through the development and maintenance of rules that regulate industrial property and copyright, as well as its availability to society. Thus, it is necessary that we reflect on new limits to IP rights, because:

[...] if it is true that intellectual property rules ensure the recognition and retribution that is due to creators, it is also true that creations are destined, sooner or later, to the community, and it is in the State's interest to encourage and maintain this cycle (ODY, 2021, *online*, our translation).

Thus, it becomes clear that there is a need to deepen the harmonization between IP rights and other fundamental rights (right to life, liberty, equality, security, and property), in view of the social role played by IP in the social welfare, establishing a balance between protection and the right of access, and consequently the right to information, science, and knowledge (SOUZA; SCHIRRU; ALVARENGA, 2020; JUNGSMANN; BONETTI, 2010).

Another question that calls attention to the importance of sharing IP in scientific communication, more specifically in collaborative research, is Resolution WHA73.1, ratified by the 194 WHO member states in 2020. It establishes a response to COVID-19 highlighting the importance of solidarity to fight the disease, aiming at collaboration and cooperation at all levels of society, especially in the development of vaccines, as mentioned by Freitas and Tasca (2020, p. 21, our translation):

One of the main points of the Resolution is the recognition of the access to extensive vaccination against COVID-19 as a global public good. The resolution calls on States to ensure universal access to essential health technologies and products to respond to the pandemic as a global priority. In that sense, vaccination should, in principle, be available on a global scale and in a non-exclusive or discriminatory way, that is, its benefits should extend to all countries.

Thus, the need to strengthen and solidify scientific collaboration as a common activity in research in the area of health is noticeable, allowing, with the sharing of IP, global and equal access to future treatments, medicines, and vaccines. And that also applies to other areas of knowledge, given that the pandemic caused impacts throughout society. Information Science, for example, must deal with the infodemic that accompanies COVID-19, requiring efforts and studies for the effective communication of research results to the scientific community, enabling those results to be organized, evaluated, and expanded on (ORGANIZAÇÃO MUNDIAL DA SAÚDE, 2020).

Accordingly, the resolution is extended to the multifaceted challenges posed by other diseases and by the promotion of health, such as non-communicable diseases, neglected conditions, and disorders related to mental health and nutrition (FREITAS; TASCA, 2020). This shows us that the sharing of IP done in such a way that protects the rights of creators as well as the dissemination of knowledge must be observed beyond the pandemic, so that the collaborative work movement is not limited to time, but to the common good that is the access to information and data, as well as the socialization of knowledge.

In the development of this research, it was also possible to notice that the open access initiatives focused on fighting the pandemic are not gathered in a way that facilitates the population's access to information, even with them seeking interaction and collaboration with

other initiatives. And that occurs because these initiatives are used mostly by public managers, researchers, and scholars, not reaching the population most of the time, which is essential to achieve transparency and access to information and data.

There is still a long way to go in advancing the discussion on Open Science – a discussion that was heated up by the pandemic – to reach this coverage. An example that the right path is being followed is the evolution of the Transparência COVID-19 initiative, which was developed and is still being developed according to the increase in transparency in the data shared by Brazilian states and the federal government, resulting in a greater reach in the media and among the general population.

The pandemic has brought us a context consisting of social chaos, changes in behavior, and dissemination of false information, requiring a new look at how we act and relate, as well as at how we do and communicate science. Therefore, when observing the analyzed initiatives, considering both the open data and the IP sharing, we can see how essential it is that we change the *modus operandi* of how we foster, design, execute, and communicate science and, consequently, research. Such a path is only possible when the objectives of Open Science are pursued, given the set of practices it encompasses and that it aims to achieve a collaborative nature in research and the democratization of the access and use of information, data, and knowledge.

The initiatives that were created already in the pandemic context, especially those analyzed in this article, are a strong indication of the strengthening of scientific collaboration in favor of the advancement of science in general, as well as of the promotion of its social role to address issues that affect the present and future of humanity, such as the COVID-19 pandemic. Of course, there is still a long way to go, and this path must be followed to stimulate not only scientific collaboration, but also of society as a whole, organically, for a common good, which is only achieved when looking at the world through the lens of Open Science.

#### 4 FINAL CONSIDERATIONS

In view of the crisis caused by the COVID-19 pandemic that spread rapidly throughout the world, we observed the importance of decision-making based on data and information, which, in turn, must be available and accessible to everyone. Thus, the discussion on open data and IP, through a look at Open Science, shows the importance of these factors in facing the pandemic, as well as their barriers and uses in the area of Health and for society, moving toward the socialization and sharing of knowledge.

This work sought to bring together public and private perspectives through the open initiatives analyzed, Transparência COVID-19 and Open Covid Pledge. Such perspectives have been enhanced by the current pandemic scenario, which requires even more effort from public institutions in the provision of government data, as well as in the joint relationship with private institutions in the provision of IP. All this effort is directed toward providing a transparent and open action focused on social participation, given the information overload that already exists and that has been made even more acute by the pandemic.

As observed, we are facing two global crises: the one caused by the virus, and the one caused by misinformation (infodemic). And only by looking from the perspective of Open Science can a common objective be achieved, which is to combat both. Thus, we can see the importance of providing society with consistent and accessible data and information, bringing government and society closer together and promoting decision-making based on data and

evidence-based information, supported by well-informed citizens, given the urgency of the rapid sharing of scientific information.

In relation to doing and communicating science, the urgency of health areas – as well as other areas, given the social, cultural, and political impacts caused by the pandemic – in publishing and accessing scientific research results about COVID-19 is evident, as well as is evident the need for transparency regarding the methods used in those studies. This sheds light, once again, on the urgency to bring science closer to those in charge of decision-making and to society as a whole. However, it is also visible that there is still a long way to go for us to fully understand the meanings, opportunities, and challenges posed by Open Science to make information and data widely available and interoperable, as stressed by Unesco (2021).

Regarding open data, there is also a long way to making them open and communicable to the population, especially in Brazil; however, through initiatives such as Transparência COVID-19, there has been encouragement and an approximation of the relationship between open government and Open Science, aiming to improve the transparency of data from Brazilian states and the federal government during the pandemic. Thus, it was observed that open data allow more reliable projections, generating an enrichment in public policy debates, activating the innovation ecosystem, and increasing the population's trust by revealing the real dimension of the problem being faced – in this case, the COVID-19 pandemic.

There is also a need to deepen the harmonization between IP rights and other fundamental rights (social function), establishing a balance between protection and the right of access. This is where the role of the public sector together with the private sector becomes important, as it is necessary that they stimulate and maintain the IP protection cycle, ensuring the recognition of those who produce intellectual goods that are later destined for the community.

Thus, the pandemic has provoked and is provoking changes in all areas of society, across scientific and social circles, stimulating, even if abruptly, the debate on Open Science, to make the scientific process more transparent and inclusive, making us reflect on and rethink the ways of doing and communicating science, as well as our role as scientists, scholars, and citizens (SEGUNDO ENCONTRO NACIONAL DE CIÊNCIA ABERTA E GOVERNO ABERTO, 2020). Therefore, thanks to international collaboration and through the adoption of Open Science principles, it was possible to generate a constant improvement in the understanding of the COVID-19 pandemic, which is still far from over.

It is essential, thus, that we continue this joint work of the public and private sectors toward advancing science, scientific collaboration, and the socialization of knowledge, in order to provide organization, preservation, access, and dissemination of data, especially open government data, as well as research related to IP sharing. All of that is, of course, particularly relevant in this pandemic context that humanity is going through, as there is a need – greater now than ever – to make scientific knowledge be disseminated and be freely accessible without financial barriers.

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