
SCIENCE, KNOWLEDGE AND SOCIETY IN TIMES OF PANDEMIC: info-communication configurations in the health field ⁽¹⁾⁽²⁾

Regina Maria Marteleto (1)

(1) Federal University of Rio de Janeiro/UFRJ, Brazil, regina.mar2@gmail.com



Abstract

This article deals with the new configurations of information and communication in the domain of health knowledge in Brazil, by the interoccurrence of two concomitant factors: the increasingly powerful increment of technical mediations in the digital environment; the health crisis caused by the pandemic of the new coronavirus - the SARS-CoV-2. To study the domain at this critical moment, we considered the scientific society that represents it - the Brazilian Association of Collective Health (Abrasco) - and the way it promoted communication among peers in the scientific field and between them and society, through the "Abrasco Agoras", a set of webinars bringing together researchers, professionals, health authorities, representatives of organizations and social movements to discuss the issues related to the pandemic moment. We started with a theoretical treatment of Domain Analysis, to then approach the new modalities of scientific info-communication in the era of E-science and pandemic. The results of the analysis of a sample of the "Abrasco Agoras" show that the intensive use of digital devices and the accelerated rhythm of scientific knowledge production demand reflections on the health domain that take into account the very way of functioning of the scientific field, the status of researchers and health professionals, the processes of production, mediation, diffusion and appropriation of knowledge, the modes of information and communication among peers and between peers and society.

Keywords: Domain analysis; collective health; public health; pandemic; health information and communication; scientific field.

Resumo

Este artigo trata das novas configurações da informação e da comunicação no domínio de conhecimentos da saúde no Brasil, pela interocorrência de dois fatores concomitantes: o incremento cada vez mais potente das mediações técnicas no ambiente digital; a crise sanitária provocada pela pandemia do novo coronavírus – o SARS-CoV-2. Para estudar o domínio nesse momento crítico considerou-se a sociedade científica que o representa - a Associação Brasileira de Saúde Coletiva (Abrasco) - e a forma como promoveu a comunicação entre os pares do campo científico e destes com a sociedade, por meio das "Ágoras Abrasco", conjunto de webnários reunindo pesquisadores, profissionais, autoridades sanitárias, representantes de organizações e movimentos sociais para discutir sobre as questões afetas ao momento pandêmico. Partiu-se de um tratamento teórico sobre a Análise de domínio, para em seguida abordar as novas modalidades da info-comunicação científica na era da *E-science* e da

pandemia. Os resultados da análise de uma amostra das “Ágoras Abrasco” demonstram que o uso intensivo dos dispositivos digitais e o ritmo acelerado de produção do conhecimento científico demandam reflexões sobre o domínio da saúde que levem em conta o próprio modo de funcionamento do campo científico, o estatuto dos pesquisadores e profissionais da saúde, os processos de produção, mediação, difusão e apropriação dos conhecimentos, os modos de informação e comunicação entre os pares e destes com a sociedade.

Palavras-chave: análise de domínio; saúde coletiva; saúde pública; pandemia; informação e comunicação em saúde; campo científico.

1. Introduction

The approach of domain analysis, pioneered by Hjørland and Albrechten (1995), opened new perspectives for studies in this field due to its proposal of approximation and systematization of the different analysis fronts of the informational object - from the aspects of organization and retrieval to those of mediation, circulation and use. Like other lines of research oriented by the inscription of the informational problematic in the epistemological, theoretical and practical context of the Social Sciences and Humanities (Shera; Egan; Wersig; Capurro; Frohmann and others), it proposes dialogues with social theory for the study of domains, a focus that is of special interest to the present approach.

In the course of the research ⁽³⁾ different domains of knowledge (Hjørland and Albrechten 1995) and scientific fields (Bourdieu 2001) were analysed using the conceptual and methodological bases of AD, combined with other theories and methodologies of the Social Sciences, taking into account the following aspects: the institutional structures; the forms of communication; the relations of the actors of the domains/fields with society; the collaborative informational practices of the research groups; the research networks. The theoretical frameworks built in an interdisciplinary way to study scientific fields/domains in Health; Architecture; Human Genetics; Water Governance, employ different methodologies such as qualitative documentary and field research, citation and co-authorship studies, social network analysis (SNA).

This article represents, therefore, the continuity of previous studies that sought to bring together the theoretical and methodological constructions developed by Birger Hjørland and other scholars of domains to those of Pierre Bourdieu and other theorists of the sociology of knowledge, to investigate the structures of production, organization and communication of knowledge. The concept of networks and the methodology of social network analysis (ars) allow a theoretical and methodological triangulation to move the analytical frameworks of

scientific domains and fields in three complementary dimensions: relational, historical and institutional. It is understood that the domains of knowledge form complex structures and in constant reconfiguration, which require from the analysts and scholars of the field of Information Science the employment of theoretical and methodological means capable of achieving understanding regarding their cultural, social and historical existence.

In this sense, the objective is to perceive the info-communicational reconfigurations of the health domain in Brazil, due to the intercurrency of two concomitant factors: a) the increasingly powerful increment of technological mediations in E-science; b) the sanitary crisis provoked by the pandemic of the new coronavirus - the SARS-CoV-2. To study the domain in this moment of emergency, we considered the scientific society that represents it - the Brazilian Association of Collective Health (Abrasco) - and the way it promoted communication and the exchange of information among peers in the scientific field and of these with society, through the "Abrasco Agoras", a set of webinars bringing together researchers, professionals, journalists, health authorities, representatives of civil society organizations and social movements to discuss the issues related to the pandemic moment.

We started with a theoretical treatment of Domain Analysis, to then approach the new modalities of scientific communication in the era of E-science and pandemic. A sample of the "Abrasco Agoras" is analysed in order to understand the new configurations of this domain of knowledge and social field mediated by info-communicational devices in a moment of health crisis. The results show that the intensive use of digital devices and the accelerated pace of scientific knowledge production demand more comprehensive reflections on the health domain that take into account the very way the field works, the status of researchers and health professionals, the processes of production, mediation, diffusion and appropriation of knowledge, the modes of information and communication among peers and between peers and society.

2. Domain analysis and sociocultural production of knowledge

Albrechtsen (2015) recalls that domain analysis (DA) emerges as a methodological approach to explore domains or work areas, focused on software reuse procedures, attributing to Prieto Diaz (1991) the pioneering use of the term. In the informational field, the DA is first presented in the seminal study by Hjørland and Albrechtsen (1995), guided by a pragmatic

vision in order to analyze the activities of knowledge organization and information retrieval in its relation to the social uses of ideas, knowledge, culture.

New perspectives are presented in this reorientation of the look about the informational object: first, that each sub-area of study and practice of Information Science would need to keep in tune with each other, from the organization and processing to the diffusion, use and appropriation, in order to achieve an understanding of the social and cultural aspects of knowledge, condition for the construction of information systems consistent with the users' needs. Secondly, the emphasis given to the Information Science inserted in the epistemological domain of the Social Sciences and Humanities, inviting to the dialogue with the theories and study methods of the socio-anthropological approaches of knowledge and, at the same time, indicating the transversality of the informational object in the different domains of science and other social fields.

The perspective of cultural and social responsibility of the informational field, recorded at the Nordic-International Colloquium on Social and Cultural Awareness and Responsibility in Library, Information and Documentation (SCARLID) in 2021, represented an important self-analysis for the epistemological, historical and institutional reconfiguration of the domain of information studies (Rayward 2004; Hjørland 2004).

Eight years after the publication of Hjørland and Albrechten's article, which inaugurated AD in Information Science, the Knowledge Organization (KO) journal, from the International Society for Knowledge Organization (ISKO), published a special issue on the theme, in 2003, directed by Birger Hjørland and Jenna Hartel. In the introduction of the issue, the organizers define AD as "an approach to Information Science (IC) that emphasizes the social, historical, and cultural dimensions of information", recalling that "collective fields of knowledge, or 'domains', form the unit of analysis of Information Science (IC)" (Hjørland and Hartel 2003 p. 125). The eleven articles gathered together seek to answer some gaps pointed out in the domain analyses until that moment. First, the focus of studies in academic communities, leaving aside other domains or social fields. Second, the absence of case studies demonstrating the methods of use of AD in empirical studies. Finally, the issue indicates different models for conducting domain analytic studies, either through traditional empirical techniques or through historical and philosophical methods.

In 2015 it is published a new issue of the Knowledge Organization (KO) dedicated to domain analysis (DA), directed by Richard P. Smiraglia and Maria José Lopez Huertas. The

organizers highlight the increase in the number of studies employing AD and the diversity of methods and application domains, especially focusing on knowledge organization. However, they note the need for greater theoretical investment in this line of studies, in order to achieve an interdisciplinary perspective capable of expanding its epistemological core, strongly guided by technological mediations (Smiraglia and Huertas 2015). Articles are presented focusing on the conceptual framework of the sociology of knowledge to ground the AD, in a complementary way to the conceptual framework already established, and on the theoretical challenges of its application in interdisciplinary domains, such as gender studies.

The domain analysis approaches open paths to interdisciplinary theoretical and methodological compositions capable of pointing out different reconfigurations of the domains of knowledge in the scientific field and in the intersections with other knowledge and practices. Thus, it is an innovative approach to guide observations on new info-communicational reconfigurations of a domain such as health, in a pandemic moment of great challenge for science and society. And how these new designs challenge the epistemologies and practices of health and other scientific fields and domains of knowledge.

3. Science 2.0 and Covid-19: changes in scientific information and communication

In the article "Scholarship: Beyond the Paper", published in Nature magazine, Jason Priem (2013) announced the arrival of a new regime of scientific production and communication. This would be largely based on the exploitation of all the potentialities of the Web, unveiling science in action, widely disseminating its results as well as its data, questioning the "artificial" difference between the processes of scientific knowledge generation and the dissemination of its products. Faced with the expansion of the modes of 'publication', the scientific journal article would be just one of the ways of making public and one of the ways of validating academic excellence. The time, according to the information scientist, would be to embrace the power of the Web to disseminate and filter in a broader and more significant way the body of knowledge generated in research. On the other hand, this accelerated and constant mode of science publicization requires the opening of dialogues and partnerships with the most varied social actors, inside and outside the scientific field (Priem 2013).

In 2014, within the collection Les Essentiels d'Hermès, organized by the Conseil National de Recherche Scientifique (CNRS), was published the collection Information et Communication Scientifiques à l'heure du numérique, (Scientific Information and Communication in the Digital Age) directed by Valérie Schafer, gathering contributions from different authors of the info-communication field on the topic. In the presentation of the work, under the instigating title Renouveau de la science et science du renouveau à l'heure du numérique (Renewal of Science and Science of Renewal in the Digital Age), the organizer brings together some relevant points for reflection on the changes in the domains of science. These would be originated not only by the entry of the digital in scientific practices, but by a set of associated factors such as socio-technical controversies, the mobilization of civil society, the criticism of technological messianism and scientism, the health crises and the restlessness in the face of the "risk society", among others. On the other hand:

At the moment that digital makes visible the factory of science [...], that a part of society aspires for new forms of democracy and governance of science, that the reshaping of the content industries and the scientific publication chain are evident, the renewal of research supported by digital tools is more than ever a question to be considered (Schafer 2014 p. 20).

A common feature that brings together for some decades this new scientific-technical regime in Web 2.0, from free access to information, open science, open data, citizen science, participatory science, among other approaches, is the necessary review of the relationship between science and society. Since previous health crises, it is known that these are moments that put science in evidence, either for good (discoveries of medicines and vaccines) or for bad (mistrust, negativism, false information), especially in a sensitive and cross-cutting field of knowledge such as health. On the other hand, experts point out that health crises throughout history in general "lay bare the social structures", i.e., reveal the inequalities in health, education, access to goods and services, and income prevailing in society ⁽⁴⁾.

The domain/field of health is undergoing new reconfigurations from this new scientific-technical-informational regime of E-science with the emergence of the new coronavirus, which gave rise to the Covid-19 pandemic, with different impacts in the regions of the world. The challenges are not new, but more intense: the accelerated mode of production, validation and publication of research results, such as the pace of preprints and the fast tracking method; the forms of mediations of epidemiological, technical and managerial information for the monitoring, control and disclosure of cases; the monitoring of Primary Health Care services

(PHC) in the reception of users; the challenge of making prevention and care information reach the most vulnerable and neglected territories by the public power.

4. Scientific communication and public dialogues of knowledge in times of pandemics: the "Abrasco Agoras"

The health field in Brazil is marked by historical, political and epistemological configurations that have conformed the interdisciplinary domain of Collective Health. In the official classification of knowledge areas certified by the research management and evaluation agencies in Brazil, Collective Health is a sub-area of the major Health area and is divided into three sub-domains or disciplines: Epidemiology; Public Health; Preventive Medicine. It is a field of knowledge and practices that understands health as a social phenomenon and, therefore, of public interest.

The origins of the constitution of the Collective Health go back to the theoretical and political work undertaken by researchers and teachers from university institutions and schools of public health in Brazil and Latin America over the last decades. It is an interdisciplinary scientific field in the horizontal plan, by bringing together the Life Sciences and the Social and Human Sciences. And also vertically, when it seeks dialogue between different forms of knowledge - common sense and scientific knowledge - and the various media and information and communication devices. One of the greatest challenges of this field, thus constituted, is to circulate information among the scientific, pedagogical and professional spheres, the media and the population. Social, technical and symbolic mediations (Jeanneret 2009) are necessary to promote the circulation and appropriation of knowledge and information.

The Brazilian Association of Collective Health (Abrasco), which represents the field, founded in 1979, arises with the objective of being a mechanism of articulation between centres of training, research and teaching in Collective Health "[...] for mutual strengthening of the associated entities and to expand the dialogue with the technical-scientific community and of this with health services, governmental and non-governmental organizations and civil society. ⁽⁵⁾ It is responsible for editing the journals "Ciência & Saúde Coletiva" and "Revista Brasileira de Epidemiologia", both in open access and scored, respectively, in first and sixth places in the Google Scholar ranking, released in July 2020. ⁽⁶⁾ During the pandemic period, the journals adopted the fast-tracking method, accelerating the cycle of peer review of articles and the

dissemination of manuscripts more quickly, facilitating the exchange of information also through preprint repositories. However, editors recognize the challenges of these new modalities in order to ensure that quality standards and research integrity are maintained.

4.1 Public knowledge dialogues in times of pandemics: the Abrasco Agoras

In ancient Greece, the agora was both a physical place, the public square, and a social space represented by the people's assemblies for exchanges, deliberations and debates - a civic space for the exercise of the word. This symbolic inaugural landmark of the Western democratic space was appropriated by the Brazilian Association of Collective Health - Abrasco, since April 2020, to name its communication strategy on the web in order to accompany the then emerging pandemic and open a channel of dialogue with the various scientific communities, health professionals and society in general. One year later, in April 2021, the Association would complete 100 sessions of the Agora Abrasco, covering the scientific, social and political debate of the pandemic. The sessions were anchored in the areas and themes that make up Collective Health and had great participation of Abrasco's thematic groups, committees and commissions, along with guests among researchers and professors from observatories, universities and other scientific associations; frontline health professionals; managers and political leaders, both from governments and social movements.

The Agoras were organized in different formats called lives, when it was the speech of a speaker on the theme in question; panel, gathering speakers to debate themes with the participation of academics and non-academics; colloquium, in the case of exposure of more directly academic themes. Another format, called "Agora: a space for free dialogue on the pandemic", would be held periodically by the board of Abrasco to take stock of the pandemic picture from various points of view, for example, the trade and geopolitical wars around the pandemic, the tracking of cases, underreporting, the inputs and equipment to combat and treat the disease, the pandemic and poverty. The Agoras was attended by an average of 2,000 participants per session and were broadcast by TV Abrasco, on the Youtube platform.

The profile of the participants is quite diversified, with the predominance of Abrasco board members, its commissions and working groups, invited specialists from the health area and other areas depending on the theme addressed, health professionals, representatives of international organizations, public authorities, other scientific societies, social organizations and movements, in addition to the general public.

4.2 Four moments of the Abrasco Agoras

On April 7, 2021, World Health Day, the Association promoted the hundredth session of the Agora Abrasco for an analysis of the very serious health emergency that had already surpassed 320,000 deaths in the country. A special panel included five experts who are members of the board of the Association for a broad and complex reading of the situation at that time and discussion of the actions needed to overcome the crisis. The session was part of the activities of the National Health Week 2021, led by the National Health Council (CNS), with lives, debates and online demonstrations.

The Agoras was continued after April 2021, however, for the purpose of this research the analysis was limited to a sample extracted from the first 100 sessions, based on the following topics: a) thematic composition in the period; b) types of institutions represented; c) variation of the session formats; d) themes focused on information and communication issues in the pandemic period. The intention was to perceive the contours of a domain in order to study its evolution and transformation over time, one of the goals of AD, as recalled Raghavan et al. (2015), at a time when science is questioned and put in evidence in an environment of denialism, uncertainty and fake news caused by the pandemic. The Abrasco Agora sessions were all held in the digital environment, remotely, broadcasted by the TV Abrasco Youtube platform ⁽⁷⁾, with a thematic diversity that followed the urgencies that presented themselves at each moment.

In the first moment, between April and May 2020, 28 sessions were held. The first took place on April 7, 2020, with a message of clarification and encouragement from the board of the Association addressed to health professionals and the general population. The others discussed topics related to the planning and production of epidemiological data for the monitoring, mapping and control of cases, in addition to the health care necessary to avoid contamination by the new coronavirus. One of the panels was dedicated to an urgent and necessary theme in the field of health: "The interface of biomolecular, clinical and collective health knowledge", aggregating the different sub-domains of the Health area, many times distanced in the making of researches in the scientific field. On 12/05/2020 the session "What information do we need to guide coping strategies?" was held in a colloquium format, with an expressive number of expositors and debaters, where the importance of notifications and regular monitoring of Covid-19 cases, epidemiological models and access to information as public assets for health management were highlighted.

The second moment, between June and July 2020, presented 31 sessions, the highest number among the periods considered. By the end of July, the country had already registered a total of 2,666,298 confirmed cases and 92,568 deaths by Covid-19*. The themes related to data and information systems stand out in the set of Agoras in the period, a relevant issue given the omission of official sources. Two sessions have special emphasis for the focus of the present analysis. The first with the panel "Scientific publishing in times of the Covid-19 pandemic", held on 04/06, was attended by exhibitor's editors of scientific journals, when the scope of "open science" was discussed, the massive and rapid production of data, information in publications and events in the midst of the pandemic, the benefits for society and science and, at the same time, the risks to the integrity of research. In this context, the speakers stress the value of cooperation, collaboration and networking for the strengthening of scientific domains and society, and the importance of qualified scientific dissemination practices.

The Agora, in panel format, "Covid 19 and denialism - Who's afraid of science?", took place on 16/07. Two types of distortions in the processes of circulation of information were discussed, namely, a) using something that has no solid basis to make any kind of statement or b) denying well-founded science. The concept of the "manufactured controversy", a controversy created to undermine public confidence in science (e.g. the anti-vaccine movement), was addressed. Concern was shown about scientific publishing in the pandemic period, since many papers were published, but not necessarily with the quality they should have been. The negationism, which is not recent, acquired new features in the pandemic, generating the fake news, even more reductive of the truth when uttered by government authorities.

In a third moment, between August and September 2020, there were 21 sessions, most of them debating emergency social themes and issues, concerning the most vulnerable social groups such as the elderly, children, adolescents and the maintenance of mental health in school, the situations of vulnerability of slum and periphery dwellers. On August 4, under the title "How is Primary Health Care (PHC) facing the pandemic of Covid-19 in Brazil? Results of the national survey", the results of the survey "Challenges of Primary Care in confronting the Covid-19 pandemic in the Unified Health System (SUS)" were presented, which collected and analyzed data on the assistance provided to the population at the local level of primary health care services, indicating the gaps in terms of personnel, material, equipment in this political, social and cultural space-time, in addition to the difficulties in safeguarding the distance and care for certain vulnerable social groups. The same way as in other moments of the Abrasco

Agoras, there was the presence of groups of researchers, professionals and activists of the Popular Education and Health (EPS) area in this third moment, to discuss the strategies of implementation of the Confronting the Pandemic Plan of Covid-19, which gathers several scientific societies of the health field in order to call the Brazilian State to propose policies and coordinate emergency actions based on scientific evidence to control, overcome and reduce the economic and social impacts of the serious health crisis on the Brazilian nation.

The fourth and last period analyzed occurred between October 2020 and March 2021, with 21 sessions of the Abrasco Agoras. At the turn of the year, on December 31, 2020, the country recorded 194,976 deaths by Covid-19 and a total of 7,675,781 confirmed cases since the beginning of the pandemic. At the end of March 2021, it counted 12,753,258 cases and 321,886 deaths since the start of the pandemic. The Agora sessions in the period addressed issues related to health surveillance; the issue of health in the municipalities; the urgent situation of the Pantanal region, in the west of the country, due to forest fires; the problem of health training in the face of the needs of society; physical, mental, intellectual or sensory disabilities and pandemic care; indigenous health; the food industry and public policy; vaccination in Brazil; the pandemic in Amazonia; strategies to contain cases of Covid-19; new variants of the coronavirus and their threats; Brazilian women in the pandemic.

There was a panel dedicated to the 25th anniversary of the *Ciência & Saúde Coletiva* journal, published by Abrasco, which highlighted the excellent score of the journal in international rankings and the thematic articulation between basic sciences, collective health and clinical research. By that time, the journal had already released two thematic issues on Covid-19. In another Agora the 20 years of Abrasco's Working Group "Popular Education and Health" were celebrated, composed of researchers who seek epistemological, practical and political articulation of the health domain with service professionals and the population, inspired by the thought of the philosopher and educator Paulo Freire. On April 7th 2021, 100 editions of the Abrasco Agoras were completed.

5. Conclusion

This article presented some reflections on the changes in the order of knowledge in the field of health, which are not exactly new, but have been accelerated and made more evident in a broader way in the pandemic moment, placing the health field and science as a whole at

the center of public debate, with the mediation of the different information and communication devices on the web.

The analysis of a sample of webinars promoted by the Brazilian Society of Collective Health, broadcasted by the Youtube platform, called "Ágoras Abrasco", brings to light the interdisciplinary, intersectoral and transversal scope of the health problematic, especially at a critical moment of the health crisis caused by the new coronavirus. The challenge of employing the mediations of technological devices due to social confinement, to inform in a qualified and dialogued way with different social actors and their knowledge, reconfigured the practices of information and scientific communication in the health field.

In this scenario, the information and communication formats in the health domain tend to a diversification that affects the processes of production, mediation, circulation and appropriation of knowledge from the approaches that have already developed in recent decades: science and open data; participatory science; citizen science, information and popular education in health, among others. These new modalities of operation in the health domain tend to evolve, not only due to the diversification of information and communication devices available to researchers, but also in the more general context of the evolution of relations between science and society. After all, the great health questions of the present time will not be solved only by good scientific information born in research centers, but by a rethinking of the necessary dialogues between the scientific field and society.

Notes

- (1) Natasha Coutinho, a Master's student in Graduate Program in Information Science/PPGCI at IBICT-UFRJ, collaborated in the collection and description of the data.
- (2) The article reports part of the analysis of the research project "Information and mediations in health: from pharmacy almanacs to web devices", funded by CNPq/MCTI.
- (3) The studies were conducted in research projects and doctoral theses by the research group "Cultura e processos info-comunicacionais (Culticom)", linked to the Postgraduate Programme in Information Science of IBICT-UFRJ. The projects were funded by the National Council for Scientific and Technological Development/CNPq. The research is reported, among other sources, in:

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- (4) Consulted in: <https://www.abrasco.org.br/site/noticias/historia-e-criises-sanitarias-os-desafios-de-viver-um-processo-historico/51137/>. In September 2021.
- (5) Consulted in: <https://www.abrasco.org.br/site/sobreaabrasco/>. In september 2021.
- (6) Consulted in: <https://www.abrasco.org.br/site/noticias/formacao-e-educacao/revistas-de-saude-coletiva-mantem-destaque-no-ranking-google-scholar-2020/50645/>. In september 2021.
- (7) <https://www.youtube.com/user/tvabrasco>

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