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# The Influence of Mixed Virtual Health Communities on Patients' Trust in their Regular Physician in a Health Crisis: An Exploratory Study of a Mixed COVID-19 Virtual Health Community

Pierre BUFFAZ
*University of Paris-Panthéon-Assas, LARgEPA*

Brice ISSEKI
*Université Paris Cité, CEDAg*

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**Abstract**

Since the outbreak of the COVID-19 health crisis in March 2020, the greater part of the world's population has experienced heightened sanitary measures, and many questions have arisen surrounding this still poorly understood disease. In search of answers, many people turn to social media, and in particular to virtual mixed health communities. This article, conducted in an exploratory spirit, explores and analyzes the influence that a community of this type, mixing patients and doctors, can have on the trust of patients towards their usual doctor. To address our problem, we identified a virtual health COVID-19 community and implemented a netnographic approach based on the collation and interpretation of linguistic and non-linguistic data. The results reveal that patients' trust in their physicians is now partially influenced by information exchanged in the virtual community, and we highlight that there appears to be a conceptual evolution of the nature of trust in the patient–physician relationship: what we call "*reverent trust*" seems to be disappearing, while a new form of trust, which we describe as "viral intermediated," seems to be appearing. This evolution, resulting from the health crisis and the rise of the peer-to-peer model characteristic of virtual communities, could be taken into account as a means to renew the medical relationship. The managerial challenge is for doctors to maintain trust with patients, for example by reconceiving the medical relationship as a triadic relationship including virtual communities as actors in the relationship.

*Keywords*
virtual health community, COVID-19, trust, patient–physician relationship, netnography.

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## 1. INTRODUCTION

Since early in the year 2020, the entire world has faced a health crisis of unprecedented scale, caused by the disease known as COVID-19. To counter the pandemic, states have put in place emergency measures to contain the spread of the virus as well as medium and long-term measures to bring the pandemic to an end. These measures have caused profound changes in people's daily lives, raising concerns about their utility and legitimacy, and have weakened social ties, leading to a widespread deterioration in people's mental health (Franck, 2020; Mengin et al., 2020). In addition, the development and deployment of a new type of vaccine (messenger RNA) in a relatively short period of time has given rise to a certain amount of concern among some members of the population. Seeking to alleviate these fears, and to try to reduce the information asymmetry related to the pandemic and its consequences, individuals have turned to the internet and have massively increased their interactions on social media. Like all other types of virtual communities, online health communities operate on the principle of the noosphere (2022), the term made popular by Pierre Teilhard de Chardin, which consists in interconnecting a group of people. This interconnection, in essence, can increase the size, scope, and depth of shared knowledge (Surowiecki, 2008). Virtual health communities are thus now positioned as a new intermediary within the medical relationship (Centola & Rijt, 2014). This intermediation, and the information exchanged between members in the communities, can blur or at least influence the trust extended by patients to their usual doctor in the context of the medical relationship. "Trust" here is defined as the willingness of one party in a relationship to render themselves vulnerable to the actions of the other party, with the expectation that the other party will perform the desired action, regardless of the ability of the first party to control it (Mayer et al., 1995). If we observe that the physician's competence is more frequently called into question as a result of the opinions expressed by members of the virtual community, it may be concluded that the trust granted to the physician by the patient depends on the nature of the information the latter gathers : from peers. Yet it has been shown that the patient–physician relationship is primarily dependent on the trust that patients place in physicians, regardless of the information sought on the internet (Laugesen et al., 2015). However, the health crisis, because of the many controversies that have arisen in association with it, has now called into question that very trust that patients place in their doctors. Thus, it is relevant to ask the following question: Do mixed virtual health communities, i.e., online communities mixing patients and doctors, influence the trust that patients place in their usual doctors, in the particular context of the COVID-19 health crisis? And, if so, how should we characterize this influence in terms of its nature and its implications for the evolution of the patient–physician relationship?

In the context of the current health crisis, and by means of an exercise in netnography, the present study, conducted in an exploratory spirit, has therefore a double objective: on the one hand, to understand the influence that a mixed virtual health community can exert on the trust that patients—members of this community—grant to their usual doctors, and on the other hand, to raise awareness among health establishments as well as the medical profession about the current transformation of the patient–doctor relationship and its consequences. Thus, we observed a mixed COVID-19 virtual health community and implemented a netnographic approach based on the understanding and interpretation of linguistic and non-linguistic data. The results of our study reveal a conceptual application of Hammer's (2010) typology of trust in the patient–physician relationship: what Hammer calls "*reverent trust*" seems to be giving way to a trust that can be described as "viral intermediated" due to the intermediation played by the mixed COVID-19 virtual health community. After a review of the literature on the concepts of virtual communities and trust in patient–physician relationships, we present the methodological approach used and then present and discuss the results. Finally, the limitations and research perspectives related to the study will be explained.

## 2. THEORETICAL FRAMEWORK

Before addressing the influence of virtual health communities on trust in the patient–physician relationship, it is necessary to clarify these key concepts.

### 2.1. Virtual health communities

Virtual health communities are one of several types of online communities whose focus is on one or more health-related topics. Virtual or online communities are, above all, the latest stage in the evolution of an old concept, that of community. With its roots in the Latin words *communis* and *munus*, this concept designates a gathering of individuals whose social organization is based on mutual aid. These social relations, tinged with both generosity and reciprocity, are reminiscent of the model of giving and receiving expounded by Marcel Mauss (2007), and empirically verified within traditional Amazonian tribes (Lévi-Strauss, 2001) and within contemporary consumerist "tribes" (Cova & Cova, 2001). This social injunction to give and receive, or to ask and then offer (Dubost, 1995), seems to underlie and constitute the basis of any community. Indeed, whether, like Tönnies (2010), we characterize it as a living organism that is fixed and devoid of an economic character, or, like Weber (2019), as a social organization in constant evolution and potentially linked to an economic activity, the community gathers individuals who feel a sense of common belonging, who have points in common, and who wish to exchange on this basis.

#### *2.1.1. The origins of virtual communities*

The qualifier "virtual" associated with the common noun "community" reflects that it arises as a result of the digitalization of the phenomenon of community. In other words, online communities have not appeared as a replacement for but as a complement to physical communities, which continue to exist in the contemporary world. This digitalization was made possible by the rise of the Web in the 1980s, and the social Web, known as Web 2.0, in the 2000s (Rheingold, 1993). Moreover, the ancestors of today's virtual communities were already based on the idea of sharing information through discussion forums (Latzko-Toth, 2014). Some, such as Computer-Mediated Communication (Wellman & Gulia, 1999) and Web-based Communities (Bishop, 2009), had a professional purpose, since they allowed employees to collaborate remotely, while others had a more playful objective, such as, in France, the Minitel (Jouët, 1989). All of them offered their participants the advantage of being able to help each other and exchange information despite temporal and geographical constraints.

#### *2.1.2. The definition of virtual community*

Since the first examples appeared in the 1990s, many researchers have attempted to define virtual communities (Komito, 1998). In this respect, theories related to communities of practice seem to have played a foundational role (Cox, 2005). Like communities of practice (Bootz, 2009; Bootz & Schenk, 2009, 2014), many virtual communities are self-organizing and develop through the desire of their members to increase their competence in a given expertise. On the other hand, unlike communities of practice, knowledge exchanges are essentially carried out on codified media and not through informal discussions (Bootz, 2009). These initial theories were later supplemented by research on innovation communities, which are communities of practice managed by companies to facilitate the emergence of innovations (Goglio-Primard & Soulier, 2018; Goglio-Primard, Cohendet, Cova & Simon, 2020). Being among the first to define virtual communities, Hagel and Armstrong (1997) consider them to be computer-managed spaces that allow for the integration of content and the generation of interactions between members, while Kozinets (1999) perceives them as a group of individuals who interact on a topic of interest to them (often related to consumption) while sharing common activities and behaviors, and respecting each other. Casalo et al. (2008) identify four characteristics that seem to be shared in the proposed definitions: a set of individuals who are energized and linked by a common desire to act, a common interest, the establishment and respect of shared norms, and the use of Web tools to interact, generate, and reinforce the cohesion of the community. Overall, online communities are multiple and varied networks of human relationships, freed from temporal and geographic boundaries by the use of the Web, and grouped around a common bond and a shared goal. Beyond this definition, it is important to understand the reasons why internet users may form or join a virtual community. According to Ewing (2008), participation in a virtual community is mainly based on the supply and demand of two types of motivations: "content-based motivations," which correspond to the search for and the provision of information or multimedia content, and "social-based motivations," which refers to the desire to create social links. Sivertstol (2018) reinforces this view by stating that participation in online communities is primarily about finding and providing support. This support confers four benefits to community members which he terms *hedonic*, *learning*, *social integration*, and *personal growth*. Internet users therefore join a virtual community mainly to provide and to benefit from informational and social support. However, it should be remembered that the transition from Web 1.0 to Web 2.0 has made it possible to democratize the ability to create and disseminate content on the internet, that is to say User-Generated Content (UGC) (Daugherty et al., 2010). In other words, an internet user is no longer just a reader, a consumer of content; he or she can, if he or she wishes, become a content producer and even a content distributor (Poncier, 2009). The sharing of all the members' UGC, i.e., their knowledge, know-how, experiences, and tips and insights, forms a thesaurus (Wasko & Faraj, 2000) or "tribal knowledge base" that can be broken down into individual and collective knowledge, where knowledge is considered in terms of objects that represent all the documents organized and electronically archived within the community and which belong to it; individual knowledge, which includes all the elements held by each member of the community; and collective knowledge, which is generated and shared within the community (publications, comments, testimonies, experiences, etc.).

### *2.1.3. Characteristics of virtual health communities*

Virtual communities form a complex landscape that some researchers have tried to decipher using types or even taxonomies (Hagel & Armstrong, 1997; Dholakia et al., 2004). Distinctions have been drawn, for example, between communities of play and communities of interest (Lechner & Hummel, 2002), communities of practice (Lave & Wenger, 1991; Brown & Duguid, 1991), brand communities (Kim & Jin, 2006; Okazaki, 2007), self-help communities (Preece, 2001) that bring together individuals who provide free and mutual support on a wide variety of topics (e.g., the WeMoms community, which brings together mothers who support each other at all stages of motherhood), and health communities.

Virtual health communities are spaces where patients and relatives of patients suffering from one or more particular pathologies gather to exchange about these pathologies (Gupta & Hee-Woong, 2004). Like the motivations stated by Ewing (2008), the members of these communities come to seek and/or offer information related to their pathology, including an explanation of their symptoms, their medical situation, or their recovery path, as well as psychological support for themselves or their peers on their care journey (Malik & Coulson, 2008). Through the consultation of content exchanged on the platform, as well as their own interactions, members of virtual health communities develop a better knowledge and understanding of their disease and the treatment prescribed by their doctor (Silber, 2009). This allows them not only to be active and involved with their doctor in their care pathway (Malik & Coulson, 2008), but also and above all to feel more confident in challenging their doctor's advice (Potter & McKinlay, 2005). This confidence on the part of patients and their families, and their increased involvement in the care process, is the direct result of what is known as medical empowerment. This refers to what Gibson (1991) defines as the social process of recognizing, promoting, and enhancing the abilities of individuals to satisfy their needs, solve their problems, and mobilize the resources necessary to control their lives. Medical empowerment has three components (Ouschan et al., 2006), defined as the physician's support to enable the patient to live with and overcome his or her illness, the level of control the patient has over his or her illness, and the patient's ability to be an actor in the medical relationship. Virtual health communities have a decisive influence on the three components of medical empowerment. Indeed, thanks to the "peer-to-peer" system on which all virtual communities, and especially health communities, are based, patients can reduce the asymmetry of information concerning their pathology and truly educate themselves by discovering knowledge about treatments or therapeutic innovations and by reading the experiences shared by other patients (Lemire et al., 2008). These virtual health communities also provide psychological support and coaching (Mo & Coulson, 2012) that can add to or even supplant that provided by the physician. Finally, the more patients participate and interact within virtual health communities, the greater their level of trust (Van Uden-Kraan et al., 2009) and the greater the benefits in terms of information and support (Malik & Coulson, 2008), which has an effect on the patient–physician relationship. It should also be noted that patient participation in virtual health communities contributes to a more prominent involvement of the patient in the medical decision (Menvielle et al., 2016), and does not necessarily indicate a loss of trust in medicine, but rather reflects a personal commitment to care and self-empowerment with respect to medical decisions (Hardey, 2004).

Given this, we suggest that a mixed COVID-19 virtual health community could exert an influence on trust in the patient–physician relationship. But what is the patient–physician relationship? What forms can it take? What changes could a mixed COVID-19 virtual health community bring about in this relationship?

### 2.2. The patient–physician relationship

Studies have been focused on the patient–physician relationship at least since the 1950s, and the relationship itself has continually evolved over the generations. Here we explore the patterns of the patient–physician relationship and its transformation since the emergence of virtual health communities.

### *2.2.1. Approaches to the patient–physician relationship*

Parsons's (1951) structural-functionalist approach postulates that the patient–physician relationship is both asymmetrical and consensual: asymmetrical because the doctor is active and the patient passive, and consensual because the active and passive roles are recognized and accepted by all (Parsons, 1951). The patient seeks treatment by calling on the doctor, who has the duty to socially legitimize the patient's status as a patient and then to cure him or her by using his or her technical skills. The doctor's attitude should be one of emotional neutrality while the patient places his or her complete trust in the doctor. The development of chronic diseases led Szasz and Hollander (1956) to supplement the functionalist approach by taking into account the patient's state of vulnerability. They proposed three sub-models of relationships: activity-passivity, guided cooperation, and mutual participation (Szasz & Hollander, 1956). However, in the development of the relationship, the physician's self-interest may run counter to that of the patient, resulting in conflicting relationships. Thus, two different cultures can be identified in the patient–physician relationship: the lay culture on the patient's side, and the professional culture on the physician's side (Freidson, 1984). An analysis of the patient–physician relationship was then carried out from the perspective of power sharing (Fournier & Kerzanet, 2007). Four models of patient–physician relations were thus defined: the paternalistic model, the informative model, the interpretative model, and the deliberative model (Emanuel & Emanuel, 1992) (see Appendix, Figure 5). The paternalistic model recognizes the existence of a proven inequality between the physician and the patient, in the sense that the physician is active and dominant while the patient is passive and consenting. The informative model consists of giving good, accurate, and factual information to the patient so that he/she can choose his/her treatment. The interpretive model is one in which the patient must be assisted in the appropriation and construction of the envisaged treatment protocols, and informed about the risks and benefits so as to accept the decision that is eventually chosen. Finally, the deliberative model, in which the patient's pathway is likely to evolve and change, since the physician's mission is to convince him or her to adopt the curative protocol best suited to his or her condition, based on an authentic and informed, but above all non-directive dialogue. The deliberative model is the one that has been recommended in patient–physician relations in France since the passing of the Kouchner law (2002).

### *2.2.2. The patient–physician relationship transformed by virtual communities*

The emergence of virtual health communities has revolutionized the patient–physician relationship. The scientific literature indicates that these communities inherently have several positive and negative effects. The use of virtual communities by patients with chronic diseases certainly leads to their empowerment, i.e., to the discovery and development by themselves of their ability to be responsible for their own lives (Oh & Lee, 2012). But, in contrast, patients can be misled by their peers who convey anecdotal information, rumors, and opinions, rather than actual validated scientific information (Ahmad et al., 2006). Physicians, on the other hand, claim that virtual communities are often havens for patients who suspect bad intentions on the part of the physician. Physicians often react negatively to patient-generated information in virtual communities, as this information requires further clarification and challenges their medical authority (Broom, 2005). As a result, the paternalistic model, in which the physician is seen as the holder of knowledge and skills, is being abandoned in favor of new forms of patient–physician relationships. The patient now has access to sufficient information (technical or testimonial) on his or her pathology, even before meeting the doctor, and this "destabilizes a medical authority that believes its legitimacy is based on the knowledge of some and the ignorance of others" (Pierron, 2007, p. 46). A permanent relational equilibrium is sought, in which, on the one hand, the patient seeks to set out his or her personally obtained information, and, on the other hand, the physician must prove and confirm his or her expertise. The traditional hierarchical dimension of the patient–physician relationship is being modified in favor of a more balanced relationship, due to the empowerment of patients (Broom, 2005). In reality, the patient–physician relationship can shift in either direction, depending on how the new dynamic affects the representations of each party. Thus, it can be noted that the physician generally responds to the patient-user of virtual groups in three different ways: (1) he or she feels threatened by the information the patient brings and reacts defensively by asserting his or her expert opinion (health professional-centered relationship); (2) he or she collaborates with the patient to obtain and analyze information (patient-centered relationship); or (3) he or she refers patients to reliable health information websites (internet prescribing) (McMullan, 2006). The transformation of the patient–physician relationship in this case is one element that raises questions about the concept of trust. In this study, the aim is to focus on the trust placed in their regular doctor by patients who are integrated into virtual health communities.

Because of these elements, we propose to consider that the patient–physician relationship is disrupted by the phenomenon of online communities, including in terms of trust. What, however, is trust? What trust(s) is/are granted by the patient to the physician, on the one hand traditionally, and on the other hand in the framework of a mixed COVID-19 virtual health community?

### 2.3. Trust in their regular physician by patients who are members of virtual health communities

The ongoing transformation of the patient–physician relationship invites us to question and better understand the parameters of the trust that patients place in their regular physician.

#### *2.3.1. The concept of trust*

Trust is a term commonly used in ordinary language. However, its understanding and theorization reveal its underlying complexity. This widely studied term does not necessarily enjoy unanimity of treatment in the scientific literature. According to Shapiro (1987), definitions of trust are so numerous that they comprise a veritable semantic potpourri. The concept of trust first appeared formally in psychology in 1958 (Deutsch, 1958), and has since been studied in many research disciplines, particularly in the humanities and social sciences. Although trust has always been present in organizations, it has only really been the subject of research in management sciences since the 1990s (Bornarel, 2007), and it continues to arouse interest. Trust can be considered one of the most important forces of synthesis in society (Simmel, 1999). It is the belief that the partner will act in the common interest (Gilson, 2003), and a feeling associated with altruistic sources (Nooteboom et al., 1996). Morgan and Hunt (1994) state that trust acts as a glue in exchange relationships so that neither party attempts to harm their partner by taking advantage of their weaknesses. Trust has been defined as a series of social expectations shared by actors during exchanges (Zucker, 1986). Benevolence, loyalty, integrity, and openness are criteria that ensure the strength of interpersonal relationships and appear as prerequisites for them (Sako, 1991). For trust to develop, there must be a framework for pursuing common goals that requires regular communication, as well as a certain proximity (Simon, 2007). Indeed, communication has been confirmed as a means used to affect trust in the patient–physician relationship, satisfy patients, and improve the quality of services provided (Chandra et al., 2018). But this frequency of communication is likely to be compromised due to the increasingly pervasive embedding of virtual platforms in patients' daily lives. Virtual communities can be seen as intermediaries between patients and physicians in their interpersonal communication.

### *2.3.2. The trust given to the physician by the patient*

Patient trust in the physician has been characterized according to three levels: the patient's trust in the physician's integrity, the patient's trust in the physician's clinical knowledge and skills, and the patient's trust in the physician as a fiduciary agent (Safran, 2007). This trust has also been addressed by Hammer (2010) through his typology that distinguishes five types of trust: "*reverent trust*" where the patient is passive and submits to the doctor who has the required knowledge to take care of his or her treatment; pragmatic trust, which the patient only manifests once the doctor has proven his or her competence; professional trust, which is based on the patient's perception and expectations of the physician's role; affinitive trust, which is expressed by the close relation between doctor and patient; and rational trust, which concentrates on the objectivity of medicine conceived as a science which the doctor calls upon. In terms of our study, it is worth noting that several works demonstrate the existence of an essential link between the search for health information conducted virtually and the concept of trust (Menvielle et al., 2016). Patients need trust at every stage of building the relationship with their physician (Krot & Rudawska, 2016). Patient trust in the physician is considered to be a set of beliefs or expectations that a healthcare provider will fulfill in a certain way (Thom et al., 2002). It also manifests as an emotional characteristic such that patients have a comforting sense of faith or dependence attached to a caregiver's intentions (Pearson & Raeke, 2000). Competence, compassion, privacy, confidentiality, trustworthiness, safety, and communication have been identified as factors that build patient trust in the physician (Pearson & Raeke, 2000). Thus, a relationship based on trust has been shown to provide therapeutic benefits, increase patient satisfaction, and consequently improve treatment outcomes (Calnan & Rowe, 2006). Trust is like a willingness to rely on others both in terms of competence and integrity (cognitive dimension) and in terms of caring (affective dimension) (Colquitt et al., 2011). Moreover, it is important to avoid confusing patient trust in the physician with patient satisfaction: indeed, it is the patient's trust in the physician that predicts the nature of patient satisfaction (Thom et al. 1999). Nevertheless, trust in the physician decreases when there is a difference between the self-diagnostic expectations of a patient member of a virtual community and the physician's own diagnosis. The key then is to recognize that it is the nature of the communication taking place during the interaction that is the determining factor in the dynamics of the patient's trust in the physician (Tian et al., 2018).

In view of these elements, we propose that, under the influence of a mixed health virtual community, patients no longer place blind trust in their usual physician, but choose to rely on information and testimonials from their peers confirmed by community physicians. Moreover, the various controversies (Varga, 2020) and situations of uncertainty observed in COVID-19 pandemic can explain the behavior of patients in virtual communities. Pougnet and Pougnet (2022) have thus explored the questioning of medical power.

Based on this literature review, we select the following core problem: In the exceptional context of the COVID-19 health crisis, what is the influence of mixed virtual health communities in the patient–physician trust relationship? To answer this, we break down our problem into three research questions (RQs).

First, it is important to examine whether there is a causal relationship—and, if so, of what kind—between mixed COVID-19 virtual health communities and patients' trust in their regular doctor. In this perspective, the following question can be asked: Do mixed COVID-19 virtual health communities have an influence on patients' trust in their usual doctor, and if so, what is its nature? (RQ1)

Secondly, it is worth looking at the changes in patients' trust in their regular doctor caused by the influence of mixed virtual health communities. In this light, the following question can be asked: What types of trust emerge through the influence of this type of community? (RQ2)

In a third and final step, it is relevant to ask whether the transformations of patients' trust in their usual physician, influenced by mixed COVID-19 virtual health communities, modify the types of trust identified in the literature. To this end, the following question can be asked: Do these types of trust conform to or deviate from those derived from Hammer's (2010) typology of trust? (RQ3)

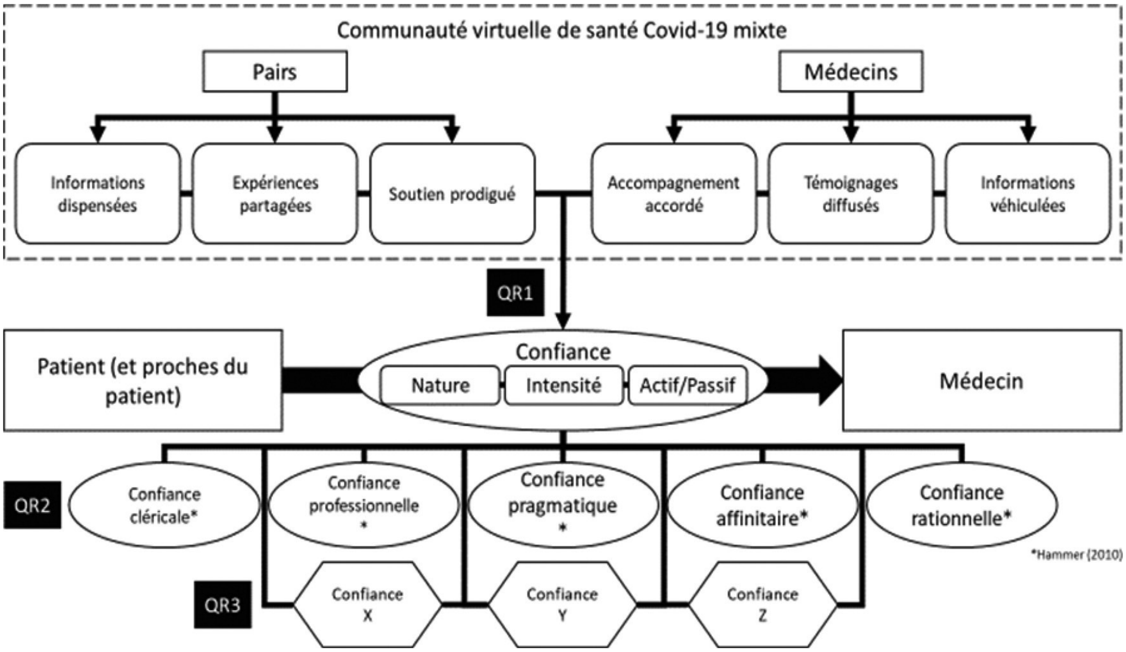

**Figure 1:** Research model

## 3. METHODOLOGY

In order to evaluate the influence of virtual health communities on trust in patient–physician relationships, this research adopted a netnographic approach to collect data and used the textual analysis software IRaMuTeQ to interpret them.

Before going further, it is appropriate to introduce two elements relating to the approach used. First, although it was invented by Kozinets (2002) some time ago, the netnographic methodology has not been widely used in management science research until now. Although good practices have been identified (Bernard, 2004), its implementation still needs to be refined. Secondly, the mixed COVID-19 virtual health communities, the subject of our netnography, remain a sensitive area. Indeed, health matters—like religious opinions or sexual orientation—are sensitive subjects and, in fact, are sometimes difficult to discuss in public by the individuals concerned (Saint-Germes et al., 2021, pp. 292–96). In the present case, the study concerns a very particular virtual health community, since the exchanges, initiated in the particular context of the COVID-19 crisis, are tightly linked to the uncertainties that characterized medical knowledge at the beginning of the global pandemic—a situation that justified the creation of this community by the doctor who initiated it.

But despite its still-infrequent use and the sensitivity of the field of observation, netnography nevertheless seemed to us, in this case, an appropriate methodology. Transposing the uses and techniques of ethnography (Prior & Miller, 2012), netnography (Kozinets, 2009) is particularly well suited to observing a virtual health community. First, it is a low-intrusion method that does not bias the behaviors of the observed and allows for the study of sensitive subjects such as health (Langer & Beckman, 2005) thanks to the relative anonymity of the participants (Bernard, 2004, p. 54). Second, netnography allows for the full embrace of the multiplicity (Cléret, 2011) and persistence of items published online. Finally, like the ethnomarketing approach, netnography combines multiple observation protocols and blends inductive and abductive reasoning, allowing one to conduct "data triangulation" (Schmidt, 2012) and embrace the entire semiology of the virtual health community being observed. In this research, both linguistic and non-linguistic data collection was conducted. In order to confirm the results of this exploratory research, triangulation is also necessary, which implies conducting additional studies, particularly quantitative ones.

### 3.1. A prerequisite to the implementation of netnography: methodological precaution

In order not to harm the people present in the field of observation and not to "poison the well of research" (Reid, 1996), the netnographer must adopt an ethical and responsible mode of conduct that respects several principles. Kozinets (2002, p. 65) proposes four ethical principles in this respect: (1) to reveal to the community the research that is being carried out; (2) to guarantee confidentiality and anonymity to the members of the community; (3) to take into account the feedback from the members; and (4) to obtain permission—"informed consent"—to use any specific messages that will be quoted in the research.

In the present research, principles (1) and (2) were respected. The research was announced by sending a private e-mail message to the Facebook group hosting the community and by sending a letter to the doctor who created the community. Moreover, due to their sensitivity, all the data collected—namely the online conversations—were anonymized. However, given the large number of authors of the online conversations collected, principles (3) and (4) could only be partially respected.

### 3.2. Selection and clarification of the observed virtual health community

The initial challenge of our netnographic exercise was to choose the virtual health community to be observed. This choice was made in two successive stages and was based on different criteria. The first step consisted in choosing the type of virtual health community to be observed. Like the systematization employed in the natural sciences, and in particular in botany, the "genus" of virtual communities can be broken down into different "species" which are in turn grouped into several "varieties." In the case of virtual health communities, it is possible to distinguish between forums (such as https://forum.doctissimo.fr/) where all diseases are discussed; communities that are focused on a single, generally chronic disease (such as https://www.carenity.com/forum/index-forums); and communities created during the COVID-19 crisis and dealing exclusively with this viral disease (such as https://www.facebook.com/groups/3129946867127476). As the former were too heterogeneous in terms of content, while the latter did not necessarily deal with the subject of COVID-19, the present search was oriented towards COVID-19-specific communities. The second step of the selection process was for us to choose the community that could offer content that would provide valid and reliable results for this research. However, it was clear that the magnitude of the health crisis has generated a profusion of virtual communities specifically focused on COVID-19. In order to find the right community, the selection was done in two steps. First, the medium: given the growth and intensification of the use of the social web (Manceau, 2020), reinforced by the health crisis, and given its 40 million active users in France (La Rédaction du Journal du Net, 2021), the social network Facebook was chosen as the platform on which to find and study a virtual health community focused on COVID-19. Then, a battery of criteria was created and applied, consisting of three criteria scales with decreasing fields of inclusion (see Table 1) that were applied successively to refine the choice of the virtual health community to observe.

**Table 1**. Criteria for choosing a virtual health community

| | |
|---|---|
| **Macroscopic criteria** | |
| Criterion no. 1 | Virtual community using French language |
| Criterion no. 2 | Degree of openness of the virtual community |
| **Mesoscopic criteria** | |
| Criterion no. 3 | Number of members of the virtual community |
| Criterion no. 4 | Number of daily publications on the virtual community |
| **Microscopic criteria** | |
| Criterion no. 5 | Mixed population of physicians and patients in the virtual community |
| Criterion no. 6 | Level of variety of topics discussed in the virtual community |

At the end of this selection based on six criteria, a virtual health community was chosen. This was the French-speaking community named "Coronavirus / COVID-19: Dr Gilles Besnainou's team replies to you" (*Coronavirus / Covid-19 : L'équipe du Dr Gilles Besnainou vous répond*). Hosted on a private Facebook group, but in fact very open, the community, which has more than 28,200 members, is led by Dr Gilles Besnainou and his team. As the community itself states, "The sole purpose of this group is to help everyone who is looking for information about the SARS-Cov-2 virus that causes COVID 19. Help by informing, help by testifying, help by alerting, help by reassuring." Moreover, this community brings together patients and relatives of patients, as well as doctors: "Doctors are present in the group, and if they have the medical knowledge to advise you, they will. But nothing will replace a consultation with your doctor." The level of activity in this community is very high, with an average of thirty posts per day, on a wide variety of subjects (stages of the disease, vaccinations, etc.). We propose to consider this virtual community as both a self-help community and a health community. Indeed, its founder—Dr. Gilles Besnainou—has given himself (with his team) a double objective: on the one hand, to share with the patients/members of his community all the information in his possession about COVID-19, and, on the other hand, to answer as best as possible the questions raised by these patients. In addition, the role of the other members is crucial in the functioning of the community, as they are both seekers as well as providers of information, experience, and moral support.

### 3.3. Data collection: netnographic method

In this research, both linguistic and non-linguistic data were collected, analyzed, and interpreted. In accordance with the principles of observation in netnography, we carried out an "unsystematic naturalistic observation" (Goffman, 1973, p. 17) both *ex ante* and *ex post* to our integration into the community. In concrete terms, this observation consisted of recording different types of language data from the chosen virtual health community, the collection of which was stopped when the variety of data became saturated (Glaser & Strauss, 1967). The main type of language data observed and analyzed were "online conversations," which consist of a publication followed by at least one comment—1,000 online conversations were collected (see Table 2).

**Table 2**. Statistics on online conversations collected

| Total number of online conversations collected | 1,000 |
|---|---|
| Of which initiated by patients and relatives | 662 |
| Of which initiated by physicians | 338 |

The other language data correspond to the persistent text elements on the community page, such as publications related to the objectives, pinned subjects, etc. It should be noted that, for a better representation of the variety of topics discussed in the community, the researchers took care to collect data spread over the entire timeframe of the virtual community's existence—from its creation in March 2020 to the end of the netnography exercise in August 2021—and not only over a specific period.

### 3.4 A collection made in anticipation of the treatment

With a view to the analysis phase, the data collection was organized by means of an inductive-type exploratory approach. In this first stage, we drew up a typology of messages based on a general observation of online conversions posted on the community. This first phase of analysis thus made it possible to determine, on the one hand, that the objectives of the messages differed depending on whether the sender was a patient or patient's relative, or a doctor, and on the other hand, that the objectives of the messages posted by the former and the latter could be of three kinds (see respectively Figure 2 and Figure 3). As a result, the online conversations collected were classified in two ways. The first entry in the classification refers to the sender of the publication or comment, which can therefore be either a patient or a patient's relative, or a doctor. The second entry in the classification refers to the nature of the publication or comment, which is intrinsically linked to the objective of the message.

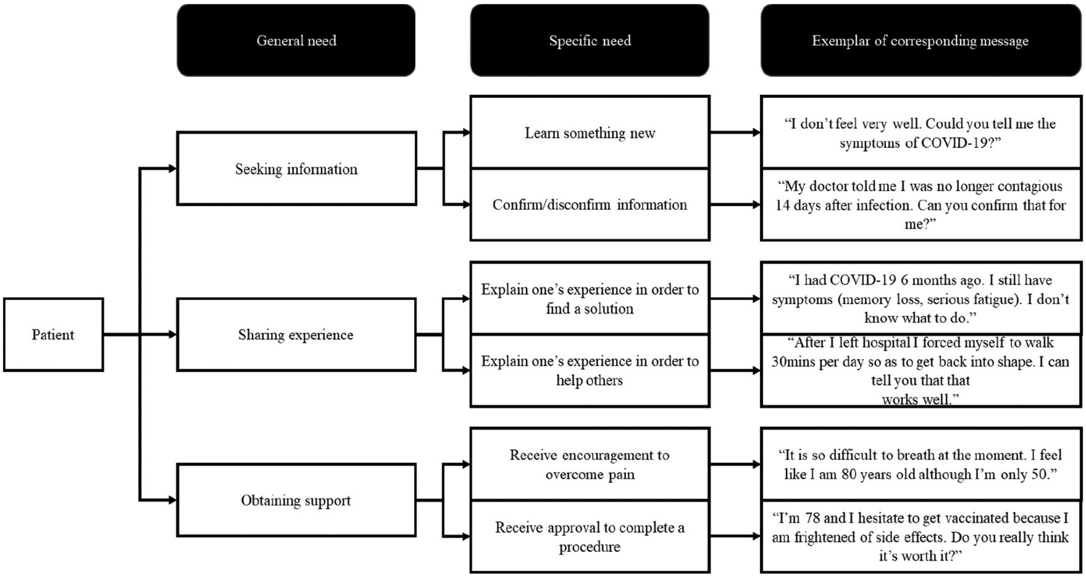

**Figure 2:** Types of messages posted by patients and relatives of patients

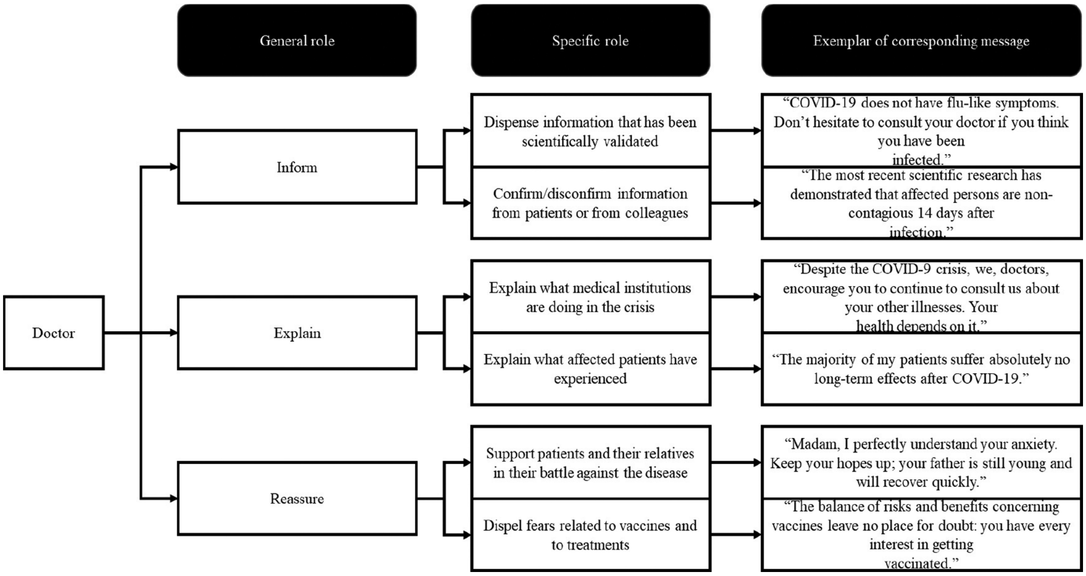

**Figure 3:** Types of messages posted by physicians

Conversations on social media carry a semiology that goes beyond the status of words since they can be embellished with symbols and illustrated by images (Paveau, 2013). These non-linguistic data include "likes," emoticons, shares, photos, and videos. They were collected and added to the language data to analyze and interpret the evolution of trust in the medical relationship initiated by the virtual health community in the COVID-19 crisis. The size of these collected data is presented in Table 3.

**Table 3**. Number of publications collected and classified by corpus

| Type of corpus | Number of conversations |
|---|---|
| Corpus relating to the search for information by patients and relatives of patients | 334 |
| Corpus relating to the sharing of experiences | 221 |
| Corpus on seeking and obtaining support | 107 |
| Body of physicians providing information | 140 |
| Corpus of physicians providing testimonials | 98 |
| Corpus of physicians reassuring patients in the community | 100 |

### 3.5. Data analysis in two steps: use of IRaMuTeQ software and content analysis

In this exploratory research, we opted for a thematic content analysis of the data collected. To analyze the data, we first used Textual Data Analysis (TDA), as developed by Lebart and Salem (1994), to help us create the necessary nodes. This approach brings together qualitative (e.g., textual references and concordances) and quantitative (assigning a central place to the calculation of specific elements and correspondence analysis) elements. Following this approach, this research was based on the IRaMuTeQ software which analyzes corpora by topic, through a top-down classification of text segments (Reinert method). The relevance of the IRaMuTeQ analysis lies in the fact that it makes it possible to highlight the nodes that structure the corpora, and it is from these nodes that we develop the content analysis and ultimately interpret the data. There were six corpora, corresponding to the six types of messages posted by patients and relatives of patients, and doctors. The corpora were constituted from the 1,000 conversations collected. Each of these corpora was then transferred to the IRaMuTeQ software to obtain a dendrogram comprising several classes. A class represents a major idea emanating from the corpus. Its significance is represented by a percentage and its meaning by the associated words, classified by occurrence. The reconstruction of a major idea requires the assembly of these words and the use of the underlying verbatim accounts. This treatment of the corpus with the IRaMuTeQ software allowed us to create nodes at several levels. As an example of the analysis process for our data, we present a dendrogram (see Figure 4). The reading of this dendrogram reveals the existence of lexical groups bringing together classes 1, 2, and 3. The nodes of this dendrogram appear in the first column of Table 3a. The other dendrograms, whose nodes appear in the following columns of Table 3a, are given in the appendices (see Figures 6 to 10). The content analysis was done manually.

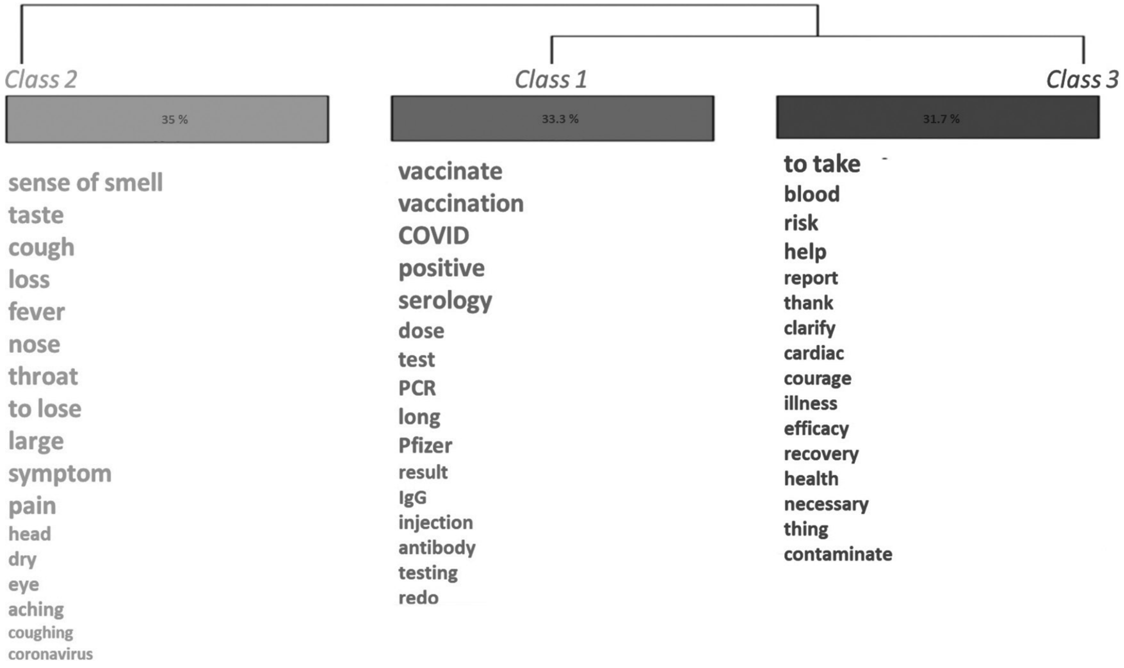

**Figure 4.** Dendrogram of the "Information search" corpus

**Table 3a**. Nodes from the dendrograms

| 1st level nodes | 2nd level nodes | 3rd level nodes |
|---|---|---|
| search for information by patients and relatives of patients | Symptoms | Blood test, vaccination |
| Sharing experiences | Experiences and benefits of the virtual community | Symptoms, duration, protection, questions |
| Seeking and obtaining support | Support for symptoms, support concerning vaccines and doses | Support for women and maternity, support for children at school |
| Provision of information by physicians | Answers to patients' questions, advice | Vaccinations, infections and symptoms, treatment, diet, barrier measures |
| Physicians and Testimonials | Monitoring the evolution of the pandemic | Containment, respect of the barrier measures, long covid, effectiveness of injections |
| Doctors reassuring patients in the community | ENT, available treatments, spirit of solidarity among people | |

1st level node = Corpus; 2nd level node = Class 2; 3rd level nodes = Class 1 and Class 3

## 4. RESULTS

Six corpora (see Table 3) were distinguished and processed from the Alceste analysis of the IRaMuTeQ software, three per type of actor (patients and doctors). In order to further describe the lexicometric analysis performed by IRaMuTeQ, we aggregated the most important lexemes—relative to their Chi-square—specific to each class. This allowed us to draw an exhaustive and detailed portrait of the classes of words used by internet users which, in the framework of Alceste, reveal what could also be called “worldviews.” These can then be detected not only through the types of words used, but also with regard to their position and frequency within the body of discourse. In addition to this table of specific lexemes (see Appendices, Tables 4 to 9), for each class, the textual data processing software provides us with a list of the most representative verbatim forms of the said class, on which we will also rely during our analyses and comments. These verbatim forms, in line with the other IRaMuTeQ procedures, are also calculated via Chi-square and allow us to highlight the information conveyed in the virtual health community. By subjecting the collected online conversations to IRaMuTeQ analysis, the software divided the utterances into a variable number of stable classes for each corpus. The dendrograms (see Figure 4 above; Appendices, Figures 6 to 10) present, respectively for each corpus, the stable Descending Hierarchical Classifications (DHC).

Data processing using IRaMuTeQ software allowed us to define the nodes retained in each dendrogram (see Table 3a) and to facilitate the thematic content analysis. This content analysis presents the following results.

### 4.1. Patient trust in mixed COVID-19 virtual health communities: the role of patients

We outline how, within the virtual community, patients’ trust in their regular physician is influenced by peer-to-peer exchanges.

#### *4.1.1. Information seeking by patients and patients’ relatives as a factor influencing their trust in their regular physician*

Class 1 verbatims reveal that Covid patients ask the physicians in the group what they think about vaccination, as the following verbatim extract shows: “Hi, My 14 year old daughter is interested in getting the vaccine. What side effects have you seen?” [Publications_patients233].

Class 2 verbatims show that patients seek input from their peers by asking questions related to Covid symptoms, as reported in the following question: “Once certain symptoms appear cough, loss of smell taste appetite how long does it take to not be contaminated anymore??! Thank you” [Publication_patients121].

In the third class, it appears that following blood tests, Covid carriers often ask questions about the risk situations to which they are exposed. More generally, it is possible to observe numerous posts by patients wanting to verify or challenge the initial diagnosis of their treating physician: “Hello, I had covid in October 2020, quite severe though. I was vaccinated in mid-March because I already had covid. And now since Tuesday I have a kind of big cold with a swollen throat and cough. My doctor says that I have bilateral sinusitis and rhino pharyngitis. Antibio and that’s it… He says it’s impossible for me to have caught covid again, he didn’t even give me a test and told me not to do it! Is he right? Can you give me your opinion? Thanks in advance” [Publication_patients64].

#### *4.1.2. Sharing experiences on the community as a factor influencing patient trust*

In terms of patients sharing their experiences, in Class 1 we collected accounts of Covid symptoms and their duration over time, as the following verbatim example shows: “I didn’t spare myself during this 1 month sick and I was never really off my feet (4 children) and I think that deep down I told myself that it was out of the question to be sick, which helped me to get up even with a fever of 39 or more, unless you have a severe migraine, of course, which would lay you out. But there you go, stay positive" [Publication_patients72].

Class 2 includes testimonials related to protection and prevention (especially at home) against the virus: "For people who are a bit slow, I never said that water kills the virus, but soap… euffff" [Publication_patients119].

Class 3 includes all the testimonials that led to questions for the doctors. Testimonials about the benefits of the group studied are listed in class 4. More broadly, many patients express their opinion of doctors, whether negative or positive: "You should suggest to this doctor that he should get informed because now long covid is recognized… It's distressing" [Publication_ patients24]; "[…] I had a follow-up appointment last Friday at Foch, the doctor who follows me told me that this post-vaccination aftershock was normal, he sees it in quite a few long Covid patients, and he thinks that going to the osteo is a very good idea. Since then, I have no more symptoms, everything is fine… until the next aftershock, but then I'll know what to do. Good luck, we'll get there!" [Publication_patients35].

#### *4.1.3. Seeking and obtaining support as factors influencing patients' trust in their regular physician*

Here, patients and their relatives want support to better live with and recover from the disease (class 1), as demonstrated by this verbatim: "My hands are tingling. I haven't been able to smell since March. My MRI and transcranial Doppler ultrasound are normal. We are now on the third treatment to relieve my pain which unfortunately persists. Today I have no life and I would like to get back to my job and my life" [Publication_patients52].

We see patients looking for testimonials from people living with the same thing as them in order to find support (class 5) and to overcome symptoms of Covid such as headaches, fever, fatigue, and aches (class 2). On the other hand, these patients and patient relatives also want support with the vaccine process (class 3), especially pregnant women in relation to the potential adverse effects of vaccines (class 4). Support is also sought to overcome the inconvenience of barrier measures imposed on children at school (class 6). More generally, a significant number of patients mention their personal situation, question their doctor, and ask for a new opinion from the community: "hello everyone, my 69 year old wife had the flu 5 weeks ago despite the vaccine, then bronchitis 5 days later: Solupred 5 days, double antibiotic therapy for 10 days, Flixotide and ventoline still no improvement the doctor prescribed 10 days of Solupred 4 for 4 days, 3 for 3 days, 2 for 2 days, 1 for 1 day, double antibiotic therapy for 15 days the doctor announced the beginning of pneumonia then bronchial spasms is this really serious all this treatment??? thank you for your answer" [Publication_ patients106].

### 4.2. Patient trust in mixed COVID-19 virtual health communities: the role of physicians

Based on their involvement in virtual community discussions, we outline how physicians influence patients' trust in their regular physician.

#### *4.2.1 Delivery of information by physicians in the virtual community as a factor influencing patients' trust in their regular physician*

This corpus highlights the new information that physicians provide to patients and relatives in the community. This concerns the answers to questions about vaccinations and antibodies (class 1), as shown by this comment: “Yes, that’s what I’m telling you, the vaccination worked with the presence of antibodies. That’s why, we’ve often said here, serology currently only gives you certain information and that it should only be done in certain cases” [Publication_physicians34].

Physicians also provide answers to questions about Covid infections and symptoms (class 2), Covid treatments, while inviting patients to refer to their treating physician (class 3), and barrier measures in place. Physicians also use these moments of exchange to support patients (class 4) and give them more peripheral medical advice to overcome the disease, such as diets to be favored (class 5).

#### *4.2.2 Physician testimonials as an influencing factor on patients’ trust in their regular physician*

From the lexemes and verbatim extracts found in this corpus, we can see that the doctors testify about the prevalence of the epidemic and its continuity over time (class 1): “What made us create this group is that the covid19 pathology begins with ENT signs and that we were the first in town to realize that the epidemic was arriving in Paris, we were the first to identify the loss of smell as a major sign of this disease. When Rudy proposed to me to create this group, I immediately saw the potential of the disease. I immediately saw the interest it could have for you. As the epidemic evolves, I try to take as much information as possible and summarize it for you in a logical and clear way” [Publication_physicians52]. They also refer to the challenging nature of the epidemic (class 2), and affirmed that containment and the respect of barrier measures are indispensable elements to get out of the crisis (class 3). In spite of these professional discourses, doctors are not indifferent to the testimonies of long-Covid victims and show them compassion (class 4). Finally, in this corpus, doctors testify about the effectiveness of vaccines (class 5) and remind us of the need to review certain treatments that are incompatible with vaccines (class 6).

#### *4.2.3. Physician support as an influence on patients’ trust in their regular physician*

From these lexemes, these doctors reassure patients about ENT issues (class 1): “here is the recommendation: nosewash and Covid ‘Nosewashes are indicated only in disabling nasal obstructions, especially in infants; for these washes, no specific precautions are necessary when performed at home by parents.’ So—if your child has a blocked nose, continue,—if not, stop,—if in doubt: call your pediatrician Good luck” [Publication_medicines24]. They also provide reassurance on the available treatments (class 2), on breathing difficulties (class 4), and finally on the need to protect oneself in order, on the one hand, to avoid blocking up the resuscitation services, and, on the other hand, to limit the number of deaths. The other mission carried out in this sense by the doctors is to recall the spirit of solidarity that prevails in the community (class 3).

## 5. DISCUSSION

Having observed all the results obtained, we now turn to discuss them.

### 5.1. From “*reverent trust*” to viral intermediated trust in patient–physician relationships

First of all, this research asked the question whether the virtual health community, through the action of the peers and doctors present in it, exerts an influence on the confidence of patients in their relations with their usual doctor (RQ1). This influence of the virtual health community seems to be proven, since many patients and relatives of patients use the community either to find answers they feel they cannot get from their regular doctor, such as information (Ewing, 2008), shared experiences, or moral support (Sivertstol, 2018); or to verify the advice provided by their regular doctor; or to supplement the advice given by their regular doctor and to reassure themselves. Conversely, many patients and patients' relatives come to the community in order to provide answers based on their own knowledge and experiences (Daugherty et al., 2010; Wasko & Faraj, 2000), which is then corroborated or nuanced by the physicians present in the community. As a result, trust in the patient–physician relationship is blurred, or at least mediated, by the influence exerted by the virtual health community, whether in a positive, negative, or neutral sense.

Secondly, we note that the professional, pragmatic, rational, and affinity forms of trusts were observed among the patients present in the community studied. On the other hand, "*reverent trust*" does not appear, which means that patients and patients' relatives present in the community no longer seem to trust doctors *de facto*. This result seems rather to be expected, since virtual communities are places of debate (Surowiecki, 2008) where each member is theoretically free to express his or her point of view and where theories, facts, and people are all up for discussion. Our second research question concerned whether or not the five types of patient trust in their regular physician (reverent, rational, pragmatic, professional, affinity) identified by Hammer (2010) existed (RQ2). The results suggest that not all of these types of trust are found in patients joining a mixed COVID-19 virtual health community.

Finally, the results allow us to identify a new form of trust. This refers to the trust created from the aggregation of a certain number of subjective and similar elements provided by the patients and relatives of patients in the community, and confirmed by the doctors who have expert and objective authority. This trust by numbers, which could be called "*crowdtrusting*," seems to be an integral part of virtual health communities. This phenomenon seems to confirm that virtual communities, and a fortiori social media, constitute a centrifugal force, based on the crowd and virality, capable of generating trust, among other things. Our third research question was about the possible emergence of one or more new types of trust as a result of patients joining a community virtual health care (RQ3). In view of our results, a new form of trust, which we call "*viral intermediation*," is newly identified.

### 5.2 The patient–physician relationship: now a triadic relationship

In addition to these major findings, several other complementary results were obtained and deserve to be discussed. The first of these concerns the motives for engaging members in the virtual health community. The different categories of publications designed prior to data collection are also reflected in the results. In other words, patients and relatives of patients do participate in the virtual health community, either to offer or request information, to share or gather experiences, or to provide or solicit support. Similarly, physicians participate in the virtual health community either to inform patients or answer their questions, or to testify, or to reassure. In addition, one approach aims to recall the influence exerted by the community mix of the group. This mix, characterized by the presence of physicians and not only medical laymen, seems to have strongly influenced the results of the study, since the emergence of intermediated viral confidence requires not only the participation of many patients and relatives of patients but also the validation of the aggregated opinions by the competent authority, i.e., the physicians. Without the presence of physicians, it is not certain that intermediated viral trust would have emerged in the observed community. This authority of the doctors is moreover enabled and made explicit by a non-linguistic data item inserted at the beginning and at the end of the messages posted by the doctors, in this case a medicinal capsule (💊). Thanks to this distinctive emoticon, patients and patients' relatives (but also the administrators of the community) know that the message is posted by a doctor and that it has a certain legitimacy that gives it veracity. It is also important to underline the intermediation that is taking place in the patient–doctor relationship. Traditionally dyadic, the patient–physician relationship is becoming triadic. The virtual health community is now inserted between patients and doctors. Due to the dissipation of the information asymmetry, the authority of physicians is no longer absolute (Potter & McKinlay, 2005). This new trend may, to some extent, reshape the foundations of the patient–physician relationship and encourage a renewal of this relationship.

### 5.3. Implications of the research

Various contributions to the existing literature can be drawn from this research. From a theoretical point of view, this research aims to enrich the literature on the concepts of virtual community and trust. Indeed, on the one hand, this research demonstrates the process of *ex nihilo* creation of virtual health communities in reaction to the appearance of a new pathology, in this case COVID-19, and the spectacular capacity of these communities to generate objective information likely to make them an attractive media organization for the people concerned. On the other hand, this research updates and enriches Hammer's (2010) model of trust through its application to virtual health communities. In this context, the updating of this model includes the disappearance of the "*reverent trust*" of patients towards their usual doctor in favor of the emergence of viral trust intermediated in virtual communities, i.e., of a trust born from the aggregation of a mass of subjective information nuanced or confirmed by an expert authority embodied by the community's doctors. Moreover, this research also highlights the interdependence between the viral health community and the intermediated viral trust, since the latter depends on the existence of the former, but also constitutes its engine of attractiveness and objectivity. From a methodological point of view, this article has shown the interest of using a research method that has been little used until now, namely netnography. The use of netnography in this work allowed for the combination of several collection protocols—in this case, ex ante observation prior to community integration and ex post non-participant observation—and data analysis—textual data analysis and semiological analysis. The main advantages of the netnographic approach were the collection of factual data on topics that may be sensitive and confidential, and the analysis of linguistic and non-linguistic data. These elements made it possible to obtain valid and reliable results on which to base the interpretation. From a managerial point of view, this work provides an essential insight into the transformation that the concept of trust in the patient–physician relationship is now undergoing. Indeed, the results of this research highlight a phenomenon of intermediation in the patient–physician relationship that is produced by the emergence and development of virtual health communities. In other words, the trust extended by patients to their regular doctor no longer depends exclusively on the expert self-reliance of doctors and the propensity of patients to trust them, but now partly depends on the virtual health communities to which patients belong in order to challenge, complete, or confirm their doctor's opinion. Virtual health communities, or at least communities that bring together patients and physicians, now constitute objectified information hubs that healthcare professionals must take into account when building trust in the patient–physician relationship. It should nevertheless be pointed out that not all patients are necessarily members of a virtual health community. This fact implies that physicians must manage a patient base whose profile can now be differentiated according to an additional parameter, which may be a factor of additional complexity in their practice of medicine. In order to best adapt their relationship with their patients, and ultimately to maintain or even develop the trust that they generate, it would be necessary, on the one hand, to make doctors aware of this aspect, and, on the other hand, to invite them to remain attentive during medical appointments so as to be able to detect, from the patients' speeches and behaviors, whether or not they are members of a virtual health community. For example, the fact that a patient has extensive knowledge about a particular disease, or that he or she wishes to discuss the doctor's medical pronouncements, may be a sign that he or she belongs to a virtual health community.

### 5.4. Limitations of the research

The present work, despite the contributions it makes, also has some limitations. First, because of its exploratory nature, the results of this work stand in need of confirmation by further studies, for example through a quantitative study consisting of administering a questionnaire in the community observed. Secondly, one of the flaws inherent to any research conducted online concerns the identity of the people observed. Indeed, while the identity of the physicians was clearly established and confirmed, that of the patients and relatives of patients whose contributions were analyzed remains uncertain because of the use of pseudonyms. It cannot be ruled out that some participants gave false or politically oriented speeches, thus biasing the results. Thirdly, the study makes it difficult to generalize the results, since it focuses only on exchanges between patients and relatives of patients and doctors in a single virtual health community. Moreover, these results concern a particular temporality: a period of the COVID-19 pandemic, when knowledge about this new pathology was incomplete. Therefore, the results and interpretation are potentially contingent, on the one hand, on the barycenter of the virtual community, namely the COVID-19 pathology, and on the other hand on the mix of the virtual community. Fourthly, the research is limited to the study of discourses held online, that is to say discourses that are freer and truer than those that would potentially be held in physical form by the participants. As a result, it is not certain that intermediated viral trust is a type of trust that can be exported to physical health communities.

### 5.5. Research Perspectives

In view of the avenues opened up by this work as well as its limitations, several research perspectives present themselves. One of them could be to verify the results obtained in single sex virtual health communities. The objective would then be to verify whether the absence of doctors, and thus of their expert authority, disrupts or even prevents the emergence of intermediated viral trust. Another avenue of research could be to test the results obtained in generalist virtual health communities or communities focused on a pathology other than

COVID-19. This time, the aim would be to observe whether the results, and in particular the emergence of viral intermediated trust, depend on the nature of the pathology around which the virtual health communities are created—the lack of knowledge of COVID-19 having potentially been a factor facilitating the emergence of this form of trust. Another avenue of research would be to conduct a study with several physicians who do not belong to the community. The objective would be to collect and analyze their perception of the evolution of trust in the patient–physician relationship, particularly in the context of poorly understood diseases (new COVID-19-type diseases, rare diseases, etc.). A final line of research would aim to see if the results obtained in a virtual health community were similar to those obtained in a physical health community. The interest of this research would be to measure the necessary character of the disembodiment of the discourse in the formation of intermediated viral trust.

## 6. CONCLUSION

This study sheds light on the intermediation of the patient–physician relationship by COVID-19 virtual health communities that bring together patients and patients' relatives, and physicians. This intermediation also influences the trust that patients and their relatives place in their regular doctor. Within these mixed COVID-19 virtual health communities, we are simultaneously witnessing the decline of "*reverent trust*", based on blind faith in the usual doctor, and the emergence of intermediated viral trust, based on the aggregation of numerous validated subjective opinions by the expert and objective authority of a trusted third-party doctor. It should be noted that the objectivity and impartiality of doctors is essential: otherwise, the virtual health community would become a vector for the dissemination and amplification of rumors ("fake news," anti-vaccine sentiment, conspiracy theories, etc.). This evolution in the process of building trust in the patient–physician relationship should be brought to the attention of healthcare professionals and, more generally, the medical profession, so that they can *change* their understanding of the patient. The overall challenge for physicians is to reinvent the patient–physician relationship so as to prevent their patients from turning away from conventional care pathways, and ensure that they continue to benefit from quality care in complete confidence.

## REFERENCES

Ahmad, F., Hudak, P., Bercovitz, K., Hollenberg, E., & Levinson, W. (2006). Are physicians ready for patients with internet-based health information? *Journal of Medical Internet Research*, *8*(3), e22.

Bernard, Y. (2004). La netnographie: une nouvelle méthode d'enquête qualitative basée sur les communautés virtuelles de consommation. *Décisions Marketing*, (36), 49–62.

Bishop, J. (2009). Enhancing the understanding of genres of web-based communities: the role of the ecological cognition framework. *International Journal of Web Based Communities*, *5*(1), 4–17.

Bootz, J.-P. (2009). Les communautés d'apprentissage: Structuration de la littérature, illustrations et perspectives, *Management 2000*, (4), 175–93.

Bootz, J.-P., & Schenk, E. (2009). Comment gérer les experts au sein et en dehors des Communautés. In J.-P. Bootz & F. Kern (Eds.), *Les communautés en pratique: leviers de chan- gements pour l'entrepreneur et le manager*. Lavoisier.

Bootz, J.-P., & Schenk, E. (2014). L'expert en entreprise: proposition d'un modèle définitionnel et enjeux de gestion. *Management & Avenir*, *67*(1), 80–102.

Bornarel, F. (2007). Trust as an instrument of analysis of the organization. *Revue française de gestion*, *6*(6), 95–109.

Broom, A. (2005). The emale: Prostate cancer, masculinity and online support as a challenge to medical expertise. *Journal of Sociology*, *41*(1), 87–104.

Brown, J.S., & Duguid, P. (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization Science*, *2*(1), 40–57.

Calnan, M., & Rowe, R. (2006). Researching trust relations in health care: Conceptual and methodological challenges—an introduction. *Journal of Health Organization and Management*, *20*(5), 349–58.

Casalo, L.V., Flavian, C., & Guinaliu, M. (2008). Fundaments of trust management in the development of virtual communities. *Management Research News*, *31*(5), 324–38.

Centola, D., & Rijt, A.V. (2014). Choosing your network: social preferences in an online health community. *Social Science & Medicine*, *125*, 19–31.

Chandra, S., Mohammadnezhad, M., & Ward, P. (2018).Trust and communication in a doctor–patient relationship: A literature review. *Journal of Healthcare Communications, 3*(3), 36.

Cléret, B. (2011). *Approches contextualisées des comportements de consommation culturelle des jeunes: regards ethnographiques sur le rap et l'Electrodance*. University of Rouen.

Colquitt, J.A., Lepine, J.A., Zapata, C.P., & Wild, R.E. (2011). Trust in typical and highreliability contexts: Building and reacting to trust among firefighters. *Academy of Management Journal*, *54*(5), 999–1015.

Cova, V., & Cova, B. (2001). *Alternatives Marketing: réponses marketing aux évolutions récentes des consommateurs*. Dunod.

Cox, A.M. (2005). What are communities of practice? A comparative review of four seminal works. *Journal of Information Science*, *31*(6), 527–40.

Daugherty, T., Eastin, M.S., & Bright, L., (2010). Exploring consumer motivations for creating user-generated content. *Journal of Interactive Advertising*, *8*(2), 16–25.

Deutsch, M. (1958). Trust and suspicion. *Journal of Conflict Resolution*, *2*(4), 265–79.

Dholakia, U.M., Bagozzi, R.P., & Pearo, L.K. (2004). A social influence model of consumer participation in network- and small-group-based virtual communities. *International journal of Research in Marketing*, *21*(3), 241–63.

Dubost, J. (1995). Editorial. *Revue internationale de psychosociologie*, 2(3), 3–6.

Emanuel, E.J., & Emanuel, L.L. (1992). Four models of the physician–patient relationship. *Journal of American Medical Association*, *267*(16), 2221–26.

Ewing, T. (2008). Forum—Participation cycles and emergent cultures in an online community. *International Journal of Market Research*, *50*(5), 575–90.

Fournier, C., & Kerzanet, S. (2007). Communication médecin–malade et éducation du patient, des notions à rapprocher: apports croisés de la littérature. *Santé Publique*, *5*(5), 413- 425.

Franck, N. (2020). *Covid-19 et détresse psychologique: 2020, l'odyssée du confinement*. Odile Jacob.

Freidson, E. (1984). *La profession médical*. Payot.

Gibson, C. (1991). A concept analysis of patient empowerment. *Journal of Advanced nursing*, *16*(3), 354–61.

Gilson, L. (2003). Trust and the development of health care as a social institution. *Social Science & Medicine*, *56*, 1453–1568.

Glaser, B.G., & Strauss, A.L. (1967). *Discovery of the Grounded Theory: Strategies for Qualitative Research*. Adlines.

Goffman, E. (1973). *La mise en scène de la vie quotidienne. 2. Les relations en public*. Editions de Minuit.

Goglio-Primard, K., & Soulier, E. (2018). Connaissance et technologie dans les communautés d'innovation. *Systèmes d'Information et Management*, *23*(1), 3–9.

Goglio-Primard, K., Cohendet, P., Cova, B., & Simon, L. (2020). Innover avec et par les communautés: Un nouveau défi pour les entreprises! *Revue française de gestion*, *2*(2), 69–79.

Gupta, S., & Hee-Woong, K. (2004). *Virtual communities: Concept, implications, and future research directions*. Proceedings of the Tenth Americas Conference on Information Systems, 2679–87.

Hagel, J., & Armstrong, A. (1997). *Net Gain: Expanding Markets through Virtual Communities*. Harvard Business Press.

Hammer, R. (2010). Confiance et risque en médecine générale: entre contradiction et intégration. In D. Carricaburu (Ed.), *Risque et pratiques médicales* (109–27). Presses de l'EHESP.

Hardey, M. (2004). Internet et société : reconfigurations du patient et de la médecine ? *Sciences sociales et santé*, *22*(1), 21–43.

Jouët, J. (1989). Une communauté télématique: les axiens. *Réseaux*, *7*(38), 49–66.

Kim, H.S., & Jin, B. (2006). Exploratory study of virtual communities of apparel retailers. *Journal of Fashion Marketing & Management*, *10*(1), 41–55.

Komito, L. (1998). The net as a foraging society: Flexible communities. *the Information Society*, *14*(2), 97–106.

Kouchner, B. (2002). *Loi n° 2002-303 du 4 mars 2002 relative aux droits des malades et à la qualité du système de santé*. Légifrance. https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000000227015/

Kozinets, R. (1999). E-tribalized marketing? the strategic implications of virtual communities of consumption. *European Management Journal*, *17*(3), 252–64.

Kozinets, R. (2002). The field behind the screen: Using netnography for marketing research in online communities. *Journal of Marketing Research*, *39*(1), 61–72.

Kozinets, R. (2009). *Netnography: Doing Ethnographic Research Online*. SAGE.

Krot, K., & Rudawska, I. (2016). The role of trust in doctor–patient relationship: qualitative evaluation of online feedback from Polish patients. *Economics and Sociology*, *9*(3), 76–88.

La Rédaction du Journal du Net. (2021). Nombre d'utilisateurs de Facebook en France. *Le Journal du Net*. https://www.journaldunet.com/ebusiness/the-net/1125276-the-users-de-facebook-en-france/#:~:text=Facebook%20compte%2040%20millions%20d,en%20moins%20de%20trois%20mois

Langer, R., & Beckman, S.C. (2005). Sensitive research topics: netnography revisited. *Qualitative Market Research*, *8*(2), 189–20.

Latzko-Toth, G. (2014). Users as co-designers of software-based media: The co-construction of internet relay chat. *Canadian Journal of Communication*, *39*(4), 577–95.

Laugesen, J., Hassanein, K., & Yuan, Y. (2015). The impact of internet health information on patient compliance: A research model and an empirical study. *Journal of Medical Internet Research, 17*(6), e143.

Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge University Press.

Lebart, L., & Salem, A. (1994). *Statistique Textuelle*. Dunod.

Lechner, U., & Hummel, J. (2002). Business models and system architectures of virtual communities: From a sociological phenomenon to peer-to-peer architectures. *International Journal of Electronic Commerce*, *6*(3), 41–53.

Lemire, M., Sicotte, C., & Pare, G. (2008). Internet use and the logics of personal empowerment in health. *Health Policy*, *88*(1), 130–40.

Lévi-Strauss, C. (2001). *Tristes tropiques*. Pocket.

Malik, S., & Coulson, N. (2008). Computer-mediated infertility support groups: An explanatory study of online experiences. *Patient Education and Counseling*, *73*(1), 105–13.

Manceau, J.-J. (2020). *Les Chiffres Fous Des Réseaux Sociaux*. Forbes. https://www.forbes.fr/business/newsletter/social-networking-figures

Mauss, M. (2007). *Essai sur le don. Forme et raison de l'échange dans les sociétés archaïques*. Quadrige/Presses universitaires de France.

Mayer, R.C., Davis, J.H., & Schoorman, F.D. (1995). An integrative model of organizational trust. *Academy of Management Review*, *20*(3), 709–34.

McMullan, M. (2006). Patients using the Internet to obtain health information: How this affects the patient–health professional relationship. *Patient Education and Counseling*, 63(1–2), 24–28.

Mengin, A., Allé, M. C., Rolling, J., Ligier, F., Schroder, C., Lalanne, L., Berna, F., Jardri, R., Vaiva, G., Geoffroy, P. A., Brunault, P., Thibaut, F., Chevance, A., & Giersch, A. (2020). Conséquences psychopathologiques du confinement. *L'Encéphale*, *46*(3), 43–52.

Menvielle, L., Menvielle, W., & Audrain-Pontevia, A. (2016). Effets de la fréquence d'utilisation des communautés virtuelles de patients sur la relation patients-médecins. *Journal de gestion et d'économie médicales*, 34(8), 431–52.

Mo, P., & Coulson, N. (2012). Developing a model for online support group use, empowering processes and psychological outcomes for individuals living with HIV/AIDS. *Psychology and Health*, *27*(4), 445–59.

Morgan, R., & Hunt, S. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing*, *58*(3), 20–38.

Noosphere (2022). Wikipedia. https://fr.wikipedia.org/wiki/Noosph%C3%A8re.

Nooteboom, B. (1996). Trust, opportunism, and governance: A process and control model. *Organization studies*, *17*(6), 985–1010.

Oh, H.J., & Lee, B. (2012). The effect of computer-mediated social support in online communities on patient empowerment and doctor–patient communication. *Health Communication*, *27*(1), 30–41.

Okazaki, S. (2007). Mobile marketing referral among the Japanese youth: does viral marketing work? Paper presented at 36th EMAC Conference, 22–25 May, Reykjavik.

Ouschan, R., Sweeney, J., & Johnson, L. (2006). Customer empowerment and relationship outcomes in healthcare consultations. *European Journal of Marketing*, *40*(9–10), 1068–86.

Parsons, T. (1951). *The Social System*. Free Press.

Paveau, M.-A. (2013). Technodiscursivités natives sur Twitter. Une écologie du discours numérique. *Epistémè*, *9*, 139–76.

Pearson, S.D., & Raeke, L.H. (2000). Patients' trust in physicians: Many theories, few measures, and little data. *Journal of General Internal Medicine*, *15*(7), 509–13.

Pierron, J. (2007). Une nouvelle figure du patient ? Les transformations contemporaines de la relation de soins. *Sciences sociales et santé*, *2*(2), 43–66.

Poncier, A. (2009). La gestion de l'image de l'entreprise à l'ère du web 2.0. *Revue internationale d'intelligence* économique, *1*(1), 81–91.

Potter, S., & McKinlay, J. (2005). From a relationship to encounter: An examination of longitudinal and lateral dimensions. *Social Science & Medicine*, *61*(2), 465–79.

Pougnet, R., & Pougnet, L. (2022). En quoi la pandémie covid-19 a-t-elle mis en question le pouvoir médical? *Éthique & Santé*, *19*(1), 31–38.

Preece, J. (2001). Sociability and usability in online communities: Determining and measuring success. *Behaviour & Information technology*, *20*(5), 347–56.

Prior, D.D., & Miller, L.M. (2012). Webethnography: Towards a typology for quality in research design. *International Journal of Market Research*, *54*(4), 503–20.

Reid, E. (1996). Informed consent in the study of on-line communities: A reflection on the effects of computer-mediated social research. *Information Society*, *12*(2), 119–27.

Rheingold, H. (1993). *The Virtual Community: Homesteading on the Electronic Frontier*. Addison-Wesley.

Safran, D.G. (2007). Patients' trust in their doctors: Are we losing ground? In D.A. Shore (Ed.), *The Trust Crisis in Healthcare: Causes, Consequences, and Cures* (79–88). Oxford University Press.

Saint-Germes, E., Gaillard, H., Guillet, O., Volia, J.-C., & Hussenot, A. (2021). S'engager dans une recherche sensible en GRH: une expérience d'agilité et de réflexivité. In E. Hennequin, B. Condomines, A. Jan-Kerguiste, N. Pijoan, E. Saint-Germes (Eds.), *GRH et questions sensibles en entreprise* (283–306). Vuibert.

Sako, M. (1991). The role of 'trust' in Japanese buyer-supplier relationships. *Economic Research*, *45*(2–3), 375–99.

Schmidt, C. (2012). La mobilité géographique des salariés à l'échelle internationale: Une étude ethnosociologique des difficultés vécues. University of Rennes 1.

Senghor, S.A. (2020). La place de la confiance dans le choix d'une méthode de dialyse chez les patients insuffisants rénaux chroniques. In C. Senik (Ed.), *Crises de confiance* (106-120). La Découverte.

Shapiro, S.P. (1987). The social control of impersonal trust. *American Journal of Sociology*, *93*(3), 623–58.

Silber, D. (2009). L'internet et le partage de la décision médicale entre patients et professionnels de la santé. *Presse médicale*, *38*(10), 1491–93.

Simmel, G. (1999). *Sociologie. Étude sur les formes de la socialisation*. Presses Universitaires de France.

Simon, É. (2007). La confiance dans tous ses états. *Revue française de gestion*, *175*(6), 83–94.

Sivertstol, N. (2018). Why help others? A study of consumers' participation in online communities for customer support. *Journal of the Knowledge Economy*, *9*(4), 1442–76.

Surowiecki, J. (2008). *La Sagesse des foules*. Jean-Claude Lattès.

Szasz, T.S., & Hollander, M.H. (1956). A contribution to the philosophy of medicine: The basic models of the doctor–patient relationship. *Arch Intern Med*, *97*(5), 585–92.

Thom, D., Ribisl, K., Stewart, A., Luke, D., & The Stanford Trust Study Physicians (1999). Further validation and reliability testing of the trust in physician scale. *Medical Care*, *37*(5), 510–17.

Thom, D.H., Kravitz, R.L., Bell, R.A., Krupat, E., & Azari, R. (2002). Patient trust in physician: Relationship to patient requests. *Family Practice*, *19*(5), 476–83.

Tian, L.,Yunjie, X., & Scott,W. (2018). Internet usage and patient's trust in physician during diagnoses: A knowledge power perspective. *Journal of the Association for Information Science & technology, 69*(1), 110–20.

Tönnies, F. (2010). *Communauté et soci*été. Presses Universitaires de France.

Van Uden-Kraan, C., Drossaert, C., Taal, E., Seydel, E., & Van De Laar, M. (2009). Participation in online patient support groups endorses patients' empowerment. *Patient Education and Counseling*, *74*(1), 61–69.

Varga, R. (2020). " La polémique Raoult": brouillage de la communication. *Revue de Recherches Francophones en Sciences de l'Information et de la Communication*, 2020(9) hal-03048120

Wasko, M.M., & Faraj, S. (2000). "It is what one does": Why people participate and help others in electronic communities of practice. *The Journal of Strategic Information Systems*, *9*(2), 155–73.

Weber, M. (2019). *Les Communautés*. La Découverte.

Wellman, B., & Gulia, M. (1999). Net-surfers don't ride alone:Virtual communities as communities. In B.Wellman (Ed.), *Networks in the GlobalVillage: Life in Contemporary Communities*. Routledge.

Zucker, L.G. (1986). Production of trust: Institutional sources of economic structure 1840-1920. In B.M. Staw & L. Cummings (Eds.), *Research in Organizational behavior* (53-111). JAI Press.

**Pierre BUFFAZ** holds a Master's degree in Management from ESCP Business School and a Master's degree in Management Sciences from the University of Paris-Panthéon-Assas. He is currently a doctoral student in Management Sciences at the LARGEPA and also an ATER at the University of Paris-Panthéon-Assas. Under the supervision of Prof. Nathalie GUIBERT, his marketing-oriented thesis focuses on customer engagement in virtual brand communities. The main objective of this thesis is to understand the nature, intensity, determinants, and consequences of customer engagement in these new organizational forms, in order to enable companies to build an "enhanced" relationship with their customers. More broadly, his research projects focus on the influence that virtual communities can have on various actors, such as the customer, and in domains such as gaming, religion, and health. pierre.buffaz@u-paris2.fr

**Brice ISSEKI** is a doctoral student in Management Sciences at the CEDAG laboratory (MEIS axis) of the Université Paris Cité where he is also an ATER. He holds a Master's degree in Management and Organizational Sciences from the University of Paris-Nanterre and a Master's degree in Business Administration and Management from the University of Paris II Panthéon-Assas. His research focuses on interactions and organizational behaviors. His thesis, under the supervision of Prof. Martine BRASSEUR, focuses on the contextual factors of interpersonal trust. brice.isseki@parisdescartes.fr

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*Title:* L'influence des communautés virtuelles de santé mixtes sur la confiance des patients envers leur médecin habituel dans un contexte de crise sanitaire

*Abstract*: Depuis l'éclatement de la crise sanitaire due à la Covid-19 en mars 2020, la quasi-totalité de la population mondiale est contrainte de vivre avec des mesures sanitaires renforcées et se pose de nombreuses questions autour de cette maladie encore mal connue. Pour obtenir des réponses, beaucoup se tournent vers les médias sociaux et en particulier les communautés virtuelles de santé mixtes. Cet article, à visée exploratoire, analyse l'influence que peut exercer une communauté de ce type, mêlant patients et médecins, sur la confiance des patients envers leurs médecin habituel. Pour répondre à notre problématique, nous nous sommes appuyés sur une communauté virtuelle de santé Covid-19 et avons mis en oeuvre une démarche netnographique fondée sur la compréhension et l'interprétation de données langagières et non langagières. Les résultats révèlent que la confiance des patients envers leurs médecin est désormais partiellement influencée par des informations échangées sur la communauté virtuelle. Une évolution conceptuelle de la confiance dans la relation patient-médecin est mise en exergue : la confiance « cléricale » semble disparaître, tandis qu'une confiance, qualifiée de « virale intermédiée » semble apparaître. Cette évolution, résultant de crise sanitaire et du modèle du *peer-to-peer* caractérisant les communautés virtuelles, pourrait être prise en compte pour renouveler la relation médicale. L'enjeu managérial consiste pour les médecins à maintenir la confiance avec les patients, par exemple en intégrant la relation médicale comme une relation triadique comprenant les communautés virtuelles comme acteurs de la relation.

*Keywords*: communauté virtuelle de santé, Covid-19, confiance, relation patient-médecin, netnographie.

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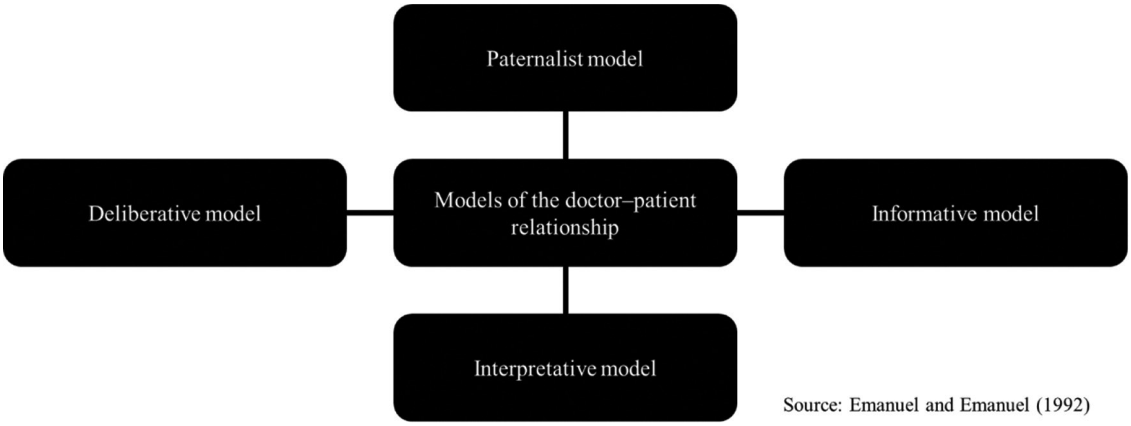
## APPENDICES



Source: Emanuel and Emanuel (1992)

**Figure 5:** Models of the patient–physician relationship

**Table 4**. Table summarizing the specific lexemes associated with each of the highlighted classes, and ranked in decreasing order of importance via the calculation of the $\chi^2$ (Information retrieval corpus)

| **Classes** | **Specific lexemes of each class (in decreasing order of $\chi^2$)** |
|---|---|
| Class 1 | Vaccinate ($\chi^2$: 56.74), Vaccination ($\chi^2$: 50.63), Covid ($\chi^2$: 42.75), positive ($\chi^2$: 41.85), serology ($\chi^2$: 36.29) |
| Class 2 | Smell ($\chi^2$: 83.01), taste ($\chi^2$: 75.91), cough ($\chi^2$: 73.5), loss ($\chi^2$: 52.81), fever ($\chi^2$: 50.17), nose ($\chi^2$: 44.65) |
| Class 3 | Take ($\chi^2$: 64.8), blood ($\chi^2$: 29.28), risk ($\chi^2$: 28.7), carrier ($\chi^2$: 24.8), help ($\chi^2$: 19.7) |

**Table 5**. Table summarizing the specific lexemes associated with each of the highlighted classes, and ranked in decreasing order of importance via the calculation of the $\chi^2$ (corpus "Sharing experiences")

| **Classes** | **Specific lexemes of each class (in decreasing order of $\chi^2$)** |
|---|---|
| Class 1 | covid ($\chi^2$: 43.43), symptoms ($\chi^2$: 34.62), month ($\chi^2$: 27.65), pain ($\chi^2$: 22.97) |
| Class 2 | go out ($\chi^2$: 25.75), virus ($\chi^2$: 24.61), protect ($\chi^2$: 23.08), home ($\chi^2$: 18.11) |
| Class 3 | opinion ($\chi^2$: 25.17), doctor ($\chi^2$: 24.75), treat ($\chi^2$: 19.22), ask ($\chi^2$: 19.22), thing ($\chi^2$: 19.22), problem ($\chi^2$: 15.81) |
| Class 4 | together ($\chi^2$ : 57,93), group ($\chi^2$ : 48,66), hope ($\chi^2$ : 44,79), besnainou ($\chi^2$ : 43,97) |

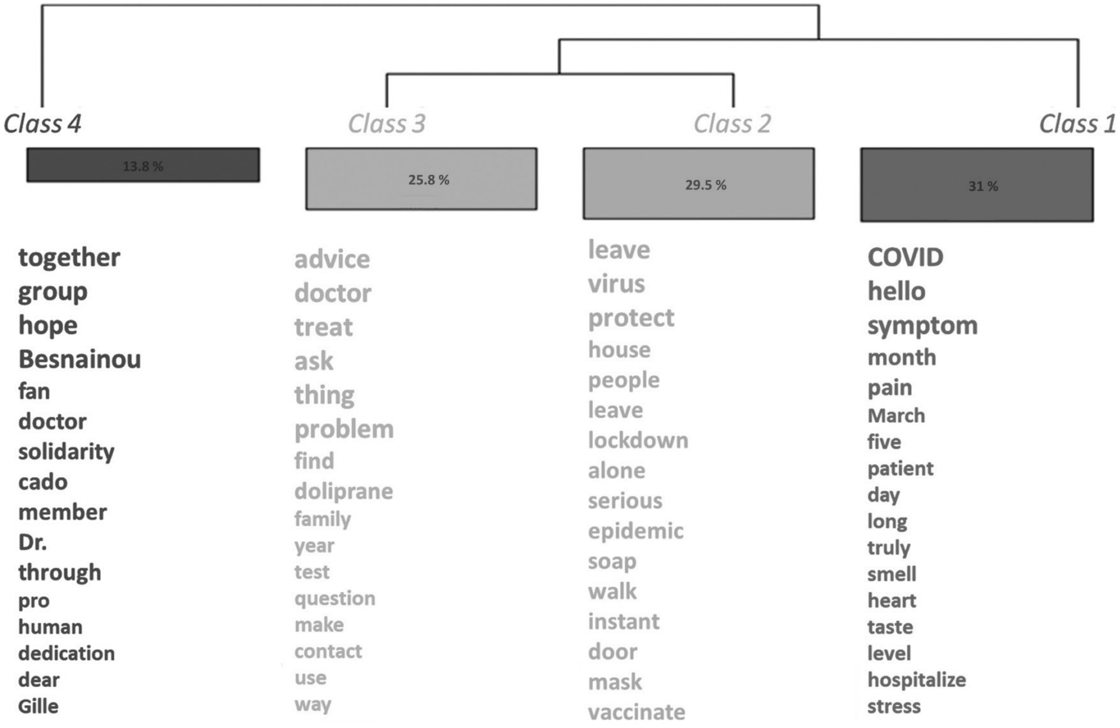


**Figure 6:** Dendrogram of the "Sharing experiences" corpus

**Table 6**. Table summarizing the specific lexemes associated with each of the highlighted classes, and ranked in decreasing order of importance via the calculation of the $\chi^2$ (corpus "Obtaining support")

| **Classes** | **Specific lexemes of each class (in decreasing order of $\chi^2$)** |
|---|---|
| Class 1 | pain ($\chi^2$: 57.46), return ($\chi^2$: 28.76), lung ($\chi^2$: 24.62), mother ($\chi^2$: 24.62), joint ($\chi^2$: 24.62) |
| Class 2 | head ($\chi^2$: 44.5), day ($\chi^2$: 40.89), fever ($\chi^2$: 34.09), fatigue ($\chi^2$: 30.01), soreness ($\chi^2$: 28.99) |
| Class 3 | vaccine ($\chi^2$ : 41.1), injection ($\chi^2$ : 33.15), catch ($\chi^2$ : 29.72), dose ($\chi^2$ : 28.55) |
| Class 4 | effect ($\chi^2$: 79.56), woman ($\chi^2$: 79.04), testimony ($\chi^2$: 49.09), pregnant ($\chi^2$: 49.09), giving birth ($\chi^2$:42.32) |
| Class 5 | thing ($\chi^2$ : 34,89), become ($\chi^2$ : 24,75), world ($\chi^2$ : 23,97), allow ($\chi^2$ : 19,7) |
| Class 6 | school ($\chi^2$ : 63,6), mask ($\chi^2$ : 48,1), child ($\chi^2$ : 39,45), wear ($\chi^2$ : 26,15) |

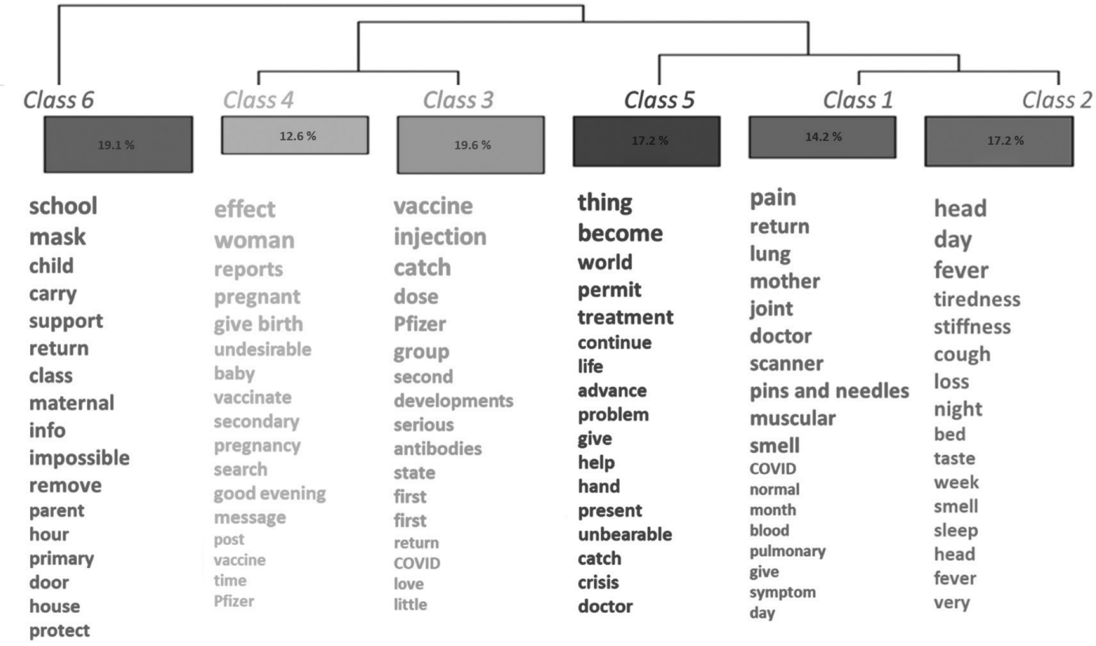


**Figure 7:** "Getting Support" Corpus Dendrogram

**Table** 7. Table summarizing the specific lexemes associated with each of the highlighted classes, and ranked in decreasing order of importance via the calculation of the $\chi^2$ (corpus "Doctor–Giving information")

| **Classes** | **Specific lexemes of each class (in decreasing order of $\chi^2$)** |
|---|---|
| Class 1 | vaccination ($\chi^2$: 63.58), antibody ($\chi^2$: 33.79), question ($\chi^2$: 32.49), positive ($\chi^2$: 23.79), injection ($\chi^2$: 23.79) |
| Class 2 | covid ($\chi^2$: 52.63), patient ($\chi^2$: 52.42), infection ($\chi^2$: 41.78), symptom ($\chi^2$: 38.3), respiratory ($\chi^2$: 34.85) |
| Class 3 | nose ($\chi^2$: 52.78), treatment ($\chi^2$: 49.49), doctor ($\chi^2$: 41.04), treat ($\chi^2$: 39.89), notice ($\chi^2$: 34.84) |
| Class 4 | set ($\chi^2$: 28.46), large ($\chi^2$: 18.78), pass ($\chi^2$: 18.78), measure ($\chi^2$: 17.55), |
| Class 5 | fruit ($\chi^2$: 47.83), sugar ($\chi^2$: 46.09), rich ($\chi^2$: 38.87), vitamin ($\chi^2$: 34.51), vegetable ($\chi^2$: 34.43) |

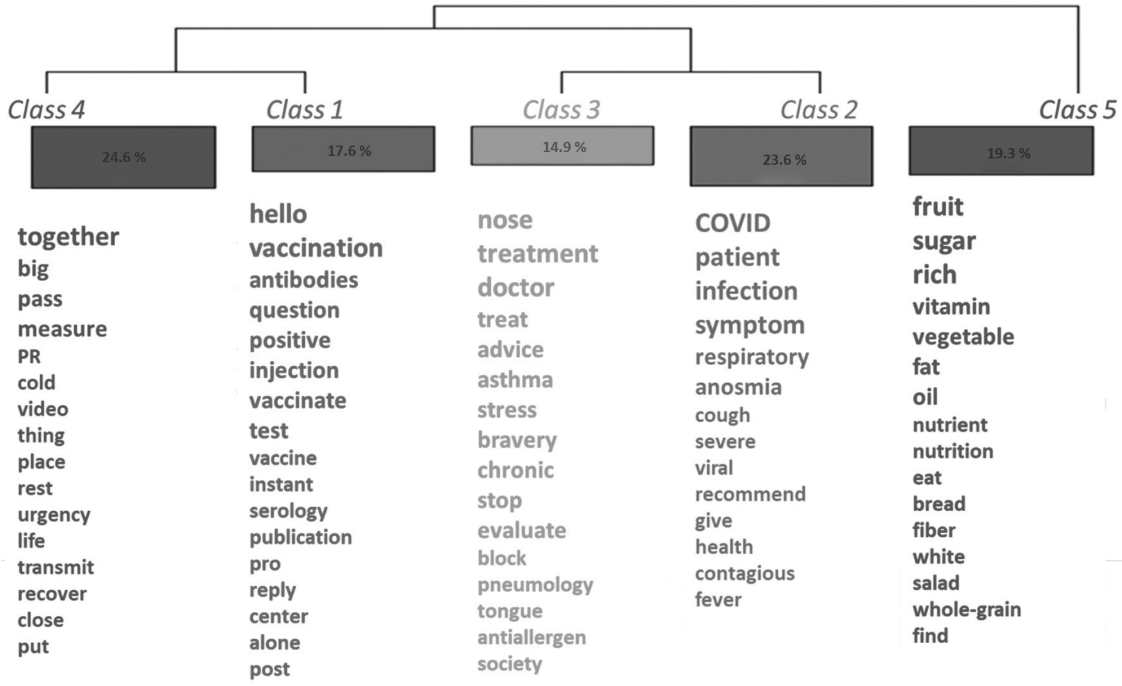


**Figure 8.** Dendrogram corpus “Doctor–Giving information

**Table 8**. Table summarizing the specific lexemes associated with each of the highlighted classes, and ranked in decreasing order of importance via the calculation of the $\chi^2$ (corpus “Doctor-Testify”)

| **Classes** | **Specific lexemes of each class (in decreasing order of $\chi^2$)** |
|---|---|
| Class 1 | covid ($\chi^2$: 32.88), ENT ($\chi^2$: 25.1), day ($\chi^2$: 20.22), paris ($\chi^2$: 14.39), wash ($\chi^2$: 11.38) |
| Class 2 | treatment ($\chi^2$ : 31,74), take ($\chi^2$ : 25,01), doctor ($\chi^2$ : 14,98) |
| Class 3 | together ($\chi^2$: 32.00), answer ($\chi^2$: 29.53), question ($\chi^2$: 25.93) |
| Class 4 | breathe ($\chi^2$: 35.55), case ($\chi^2$: 24.9), fever ($\chi^2$: 24.8), think ($\chi^2$: 24.8), cough ($\chi^2$: 19.61) |
| Class 5 | rea ($\chi^2$: 24.97), severe ($\chi^2$: 18.96), avoid ($\chi^2$: 18.96), death ($\chi^2$: 16.06) |

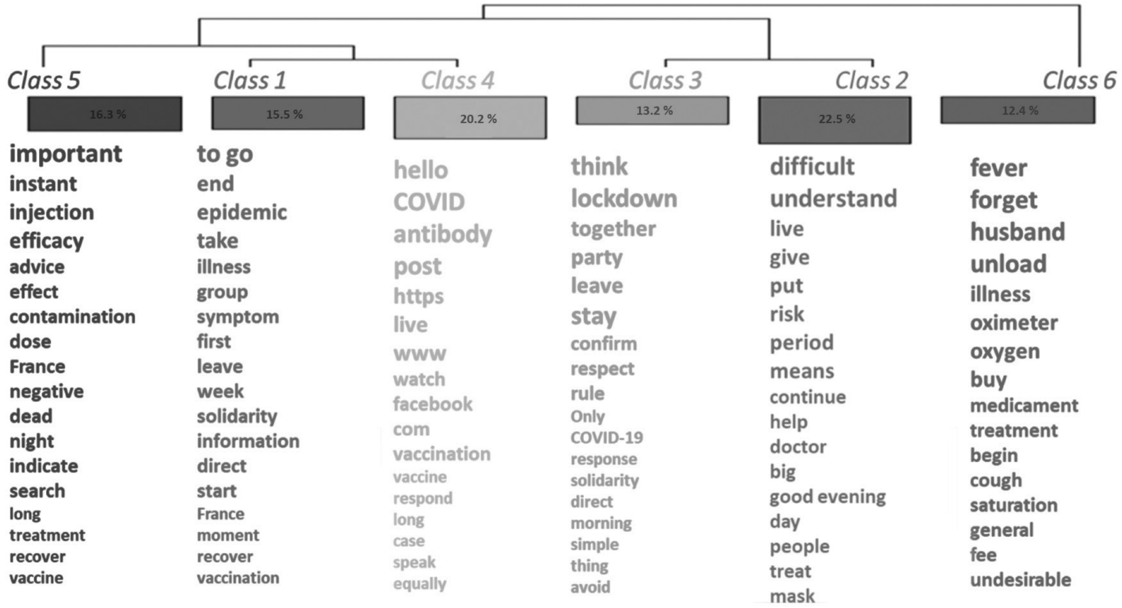


**Figure 9:** Dendrogram of the "Doctor–Witness" corpus

**Table 9.** Table summarizing the specific lexemes associated with each of the highlighted classes, and ranked in decreasing order of importance via the calculation of the $\chi^2$ (corpus "Doctor-Reassure")

| Classes | Specific lexemes of each class (in decreasing order of $\chi^2$) |
|---|---|
| Class 1 | go ($\chi^2$: 45.92), end ($\chi^2$: 22.5), epidemic ($\chi^2$: 22.1), take ($\chi^2$: 16.59), disease ($\chi^2$: 12.57) |
| Class 2 | difficult ($\chi^2$ : 25,52), understand ($\chi^2$ : 21,7), live ($\chi^2$ : 14,23) |
| Class 3 | think ($\chi^2$ : 41,18), containment ($\chi^2$ : 30,59), set ($\chi^2$ : 21,95) |
| Class 4 | covid ($\chi^2$ : 25,66), antibody ($\chi^2$ : 20,61), post ($\chi^2$ : 19,77) |
| Class 5 | important ($\chi^2$: 43.23), moment ($\chi^2$: 21.23), injection ($\chi^2$: 21.23), efficiency ($\chi^2$: 21.23) |
| Class 6 | fever ($\chi^2$: 29.15), forget ($\chi^2$: 29.15), discharge ($\chi^2$: 29.15), sick ($\chi^2$: 21.69) |

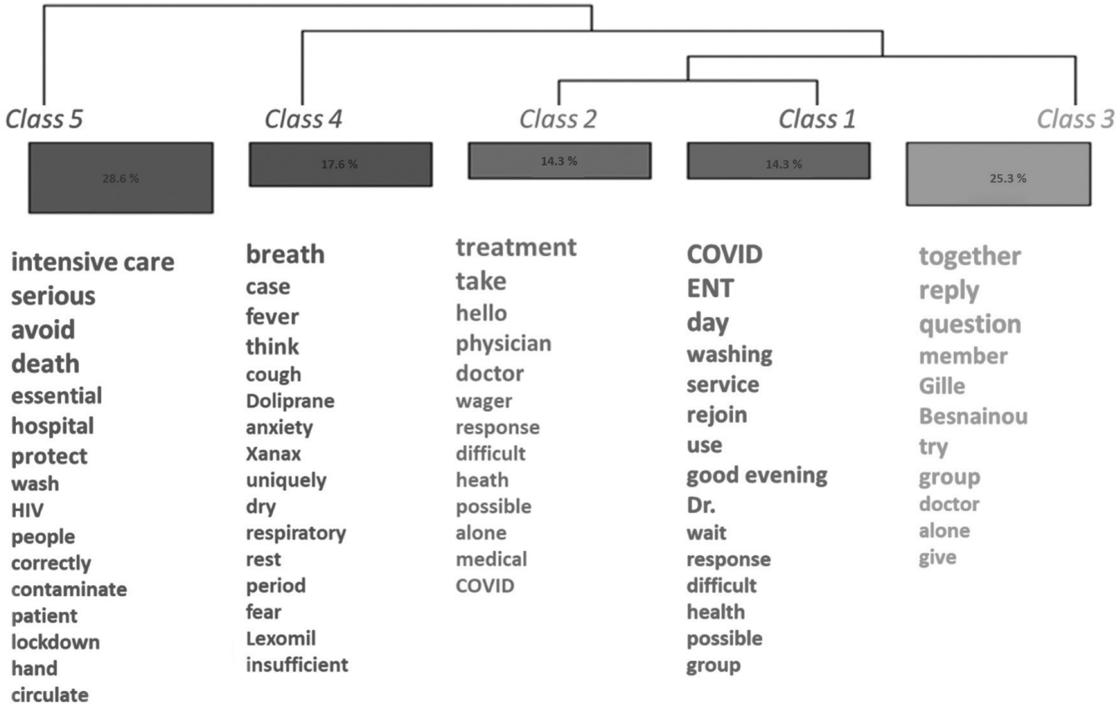


**Figure 10:** Dendrogram of the "Doctor–Reassure" corpus