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► **To cite this version:**

Christian Bourret. The Impact of the Covid Pandemic and the Resilience of the Healthcare System in France: Cooperation, Digital and Territorial Challenges with Information and Communication Approaches. Sergey Y. Yurish. Advances in Intelligent Systems: Reviews, Vol. 2, 2, International Frequency Sensor Association (IFSA) Publishing, pp.149 - 178, 2021, 978-84-09-17674-8. hal-03997021

HAL Id: hal-03997021

<https://hal.science/hal-03997021>

Submitted on 7 Apr 2023

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The Impact of the Covid Pandemic and the Resilience of the Healthcare System in France: Cooperation, Digital and Territorial Challenges with Information and Communication Approaches

Christian Bourret

6.1. Introduction

In 2000, for the World Health Organization (WHO), France “offered the best general healthcare”, which positioned it as the best health system in the world, particularly in terms of access. Much has changed since then [1]. Within the framework of the Welfare State that developed during the prosperous period known as the “Thirty Glorious Years” (1945-1973), the social protection system in the broad sense and, in particular, the Social Security system founded in 1945, has become a source of pride and a symbol of identity for France, which devotes almost 33 % of its GDP to it, one of the highest rates in the world, with more than 11.5 % spent on healthcare and 12.5 % on pensions. As early as 1998, P. Rosanvallon had insisted on the need to rethink it [2]. Some ten years later, Y. Yalgan and P. Cahuc spoke of the affirmation of a “society of mistrust”, affecting all institutions, in particular the State and the French social model [3]. From the end of 2018, the “Yellow Vests” crisis has revealed this crisis of “peripheral France” [4] and of French society as a whole [5].

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This French healthcare system, already in a severe crisis (the question of operating costs having led to hard staff reductions in recent years) has been strongly impacted since March 2020 by the Covid pandemic. By 24 December 2020, the Covid pandemic had caused 1.730.663 deaths worldwide, including 326.413 in the United States, 70.395 in Italy 69.051 in the United Kingdom, 61.978 in France, 49.698 in Spain and 28909 in Germany. It is so an essential concern to analyse the resilience of the Health System [6].

How did it come to this? And what solutions can be envisaged, in a context of digital transformation that has already taken on great importance? And what role for Intelligent Systems applications and their interactions with human users: digital devices, platforms, telemedicine, artificial intelligence, etc.?

After this introduction, we will present the French healthcare system, already in crisis, and now additionally impacted by Covid pandemic (Section 6.2), then we explain our scientific position and the methodology used (Section 6.3). We outline the E-Health challenges and its information and communication perspectives (Section 6.4). In Section 6.5, we focus on the unavoidable challenge of the Territories. Finally, we will consider the interface organisations as spaces for innovation as a lever for the transformation of the French Healthcare System (Section 6.6), before concluding with a conclusion putting the main challenges encountered into perspective.

6.2. A Health System Already in Crisis, Strongly Impacted by the Covid Crisis

6.2.1. A Health System Already in Crisis

The French Health System could be considered effective (in terms of access to care) but not efficient (difficulty in controlling costs). Its reforms have followed one another since 1977, when it was in deficit for the first time. This is the whole issue of “medicalised control” of costs. But is it really a system? Some people have doubts about its “silos” operation [7]: it’s the whole question of its compartmentalisation, particularly between primary care and the hospitalisation sector.

Healthcare is an essential sector in the digital transformations of our entire society, using interactive devices. In the developed countries, Healthcare systems must tackle huge problems (especially costs), hoping digital devices help to solve them and also help to improve the quality of care and their results. It is also the problem of traceability of medical acts and so interoperability of different tools. An approach may be through uses of interactive devices such as artificial intelligence solutions for the improvement of human-computer interactions through telemedicine platforms [8].

The Isaac's report [9] clearly highlighted the main challenges of this transformation, with digital technology and Intelligent Systems enabling the transition from a too curative to a more predictive medicine. More recently, Villani's report [10] stressed the importance of Artificial Intelligence (AI), particularly in the healthcare sector. A Montaigne's Institute report considers e-Health as a priority project to transform the French Healthcare System [11].

For several years now, the main challenge has been to focus on the coordination of medical acts, particularly with digital devices (shared computerised records, platforms, etc.), in the context of a new 4P (Personalization, Prevention, Prediction, Participation), or even 5P (Relevance or Proofs) or even 6P (Pathways) or 7P (Platforms) medicine.

6.2.2. Coordination to Fight against Compartmentalisation and the Challenges of «Border» Areas

This emphasis on development corresponds to the objective of combating the compartmentalisation of the French Health System. Compartmentalisation can indeed imply “breaks” in patients' care pathways, which can constitute both a loss of chances of better treatment, or even of survival, and major elements of non-quality, and therefore an increase in costs and waste, notably through the redundancy of acts, with major challenges of interoperability of the various digital devices and traceability of the medical acts performed.

In a Health System considered in a Cartesian or even Taylorian approach to the scientific organisation of work, the patient is often “broken” or “fragmented”, reduced to an organ or a pathology, without an overall vision of his whole body and his whole person (organic / psychological).

There are also the partitions between diagnosis (cure), which is the responsibility of doctors, and care, which is the responsibility of nurses, but also with the social and appoint home helps, for a more global approach to health and not only cure or care. However, the main compartmentalisation of the French health system is, above all that between primary care of so-called “town medicine” and the hospitalisation sector. As a reaction to an overly “hospital-centered” system, for many years there has been talk of an “ambulatory shift”, revaluing town medicine, or even, now, a “home shift”, with patients increasingly wanting to be treated at home, which, in addition would make it possible to reduce costs. However, we must underline the risk of transferring the financial and mental burden on families, with the whole issue of family careers. There is also the question of professional identities, particularly in their digital dimension, without forgetting the question of corporatism, which is largely a vector of compartmentalisations and tensions, even of conflicts between actors or groups of actors...

This question of “compartmentalisation leads us to a broader reflection on the ambivalence of the notion of “border”. There exist two opposing conceptions of the border. The first, the best known, is that of the border as a separation, as a “barrier” with walls and fortifications, such as the Great Wall of China or the Roman “*limes*”. A border with controls, especially police or customs controls. But there is also another possible approach to the border, less known, that of the “membrane” border, as an area of exchange and complementarity. This approach existed in particular in the Pyrenees before 1789, at a time when, before the national states of France and Spain were fully asserted, the populations of the high border valleys had been able to build a society of exchange and cooperation, which nevertheless did not prevent all conflicts [12].

This approach of the border as an area of exchanges and complementarities can be found in the Health System. For the last forty years or so, it has corresponded to the affirmation of Healthcare Interface Organisations (HIO) in France, to overcome the compartmentalisation, particularly between urban medicine and the hospital sector. These interface organisations (health networks, multi-professional health centres, home hospitalisation, etc.) can be considered “hologrammatic”, i.e. representative of the major challenges facing the Health System.

6.2.3. With Resilience challenges

For us, these important coordination challenges are an essential part or the Resilience's challenges of all the Health Systems, as recently outline by an European Commission's report [6] "to increase Health System's capacity to absorb, withstand and recover from shocks and stresses", improving preventive, forecasting and adaptive capacity. The same report insists on the importance "to identify the core health features that render health systems resilient". This work is completely in this perspective.

These challenges are largely information-communication challenges, now with a strong digital dimension (E-Health) with the whole question of territories, with, in particular, social and territorial inequalities in health, in their double dimension, both individual and collective. European Commission's report speaks about "developing more effective communication tools" [6], in other words, Intelligent Systems.

But first we need to better define our scientific position and the methodology used.

6.3. Scientific Position and Methodology

6.3.1. A Research-action Position in Information and Communication Sciences

Our works on border areas in the French Health System, notably through interface organisations considered as "hologrammatic", or representative of the stakes of the Health System as a whole, are based on cooperation developed around Master's degrees (Healthcare Network Engineering, Social Protection, Competitive Intelligence and territories), with follow-up of these masters degrees and doctoral dissertations as well as participation in numerous seminars, both face-to-face and distance learning. They have led to publications in journals and conferences and to a habilitation to manage research and PhD [13].

We position in a research-action or intervention-research approach, based on a back and forth between theoretical and practical dimensions, to produce knowledge for action. Our works are within the scope of the

French interdisciplinary field of Information and Communication Sciences, in the perspective outlined by F. Bernard [14], proposing to articulate the four dimensions of links or relationships (interactions in a systemic dimension), meaning, knowledge and action. We insist on the complementarity of information and communication, stressing both the importance of information to shape organizations and data for their management and development, and also of communication to foster change [15], by promoting cooperative dynamics, articulating the project and storytelling dimensions of all actors actions [16], both human and socio-technical devices. We propose an approach that we call Information and Communication Organizing Ecosystems (ICOE). The notion of “organizing” was proposed by Weick [17], focusing on processes, and interdependence of interactions, to study human activity by means of “sense making recipe” in a set of dynamics to try to grasp the complexity of organizations. We refer also to communication as constitutive of organizations [18] adding to that of communication the information dimension. For us, information and communication contribute to the shaping of organizations (companies, universities, hospitals, interface organizations, administrations, trade unions, etc.) considered as ecosystems, which can be also groups (families, students in classrooms, etc.) or territories. We thus articulate the approaches of Economic or Competitive Intelligence and Quality [19], in the wake of H. Wilensky [20], when he speaks of Organizational Intelligence, without forgetting the innovation dimension in process approaches [21].

6.3.2. Around Key Notions: Tensions, Situations, Interactions, Ecosystems, Trust, Resilience

According to E. Goffman [22], we particularly mobilize the notion of situation (situations of activity, management, information, communication, decision, evaluation, etc.) with all the ambivalence of technology [23]. There exist important tensions between people in favour of new uses of digital technology (technophiles) to improve patient services, such as G. Vallancien [24] and those who fear regression in its financing. For us, modernization or rationalization may mean rationing or “uberisation” (standardization and precarization of the health professions), such as the National Board of Doctors or *Conseil National de l'Ordre des Médecins* in France [25]. So there exist a lively debate between convinced technophiles and others, technophobic or at

least more technosceptical, insisting on the ambivalence of technologies and the risk of drifting to an overly “solutionist” approach, based on the imposition of digital tools without real consultation with their users.

According to the “situational and interactionist semiotics” proposed by A. Mucchielli [26], we analyze situations of activity, also integrating the dimension of emotions and leadership [27] and trust building in complex projects as proposed by Le Cardinal, with the main problem of overcoming fears [28]. For us this main challenge of rebuilding trust, both in human and in tools, is an essential part of the Resilience of the whole Healthcare Systems, and, more generally, of our entire society.

The main goal is to help to promote new services for patients and healthcare professionals, with the importance of information (data uses) and communication to improve cooperation with a strong territorialisation and proximity dimension with the essential part of trust to go to more coordination and cooperation is frequently outlined in various congresses or seminaries [29].

The context is that of patients’ empowerment, developed in France since the March 4th 2002 (Law about Sickness People Rights and Quality of Health System) with the idea of “Health Democracy”. Through social technical devices and social networks, patients have an increasing role. Always insisting of the human dimension of healthcare, we are interested, according to Y. Jeanneret’s perspective [30], in the importance of “traces”, as showing the different aspects of work activities and of identity, particularly digital, in both their individual and collective dimensions.

6.4. E-Health and Its Information and Communication Issues

6.4.1. The Development of E-Health Accelerated by the Covid Crisis

A Montaigne’s Institute think tank report considers e-Health using Intelligent Systems as a priority project to transform the French Healthcare System [11]. In June 2020, Montaigne’s Institute estimated the potential value creation of E-Health in France between €16.1 and €22.3 billion per year. This economic value creation can be divided into

5 categories of innovations and impacts: 1) patient empowerment and the prevention of complications, particularly for chronic diseases; 2) dematerialization and data exchanges, with optimization of the medical time of healthcare professionals; 3) telemedicine tools, notably with the use of teleconsultations to limit hospitalizations; 4) automatization and optimization of care pathways in both primary care and hospital and at the articulation of these two sectors; 5) transparency and decision support, by limiting the redundancy of healthcare acts and overpayments.

The Covid crisis fosters the transformation of the Healthcare System through new digital uses both for doctors and patients' uses. During the two lockdown period (in French: *confinement*), in spring and then in autumn 2020, the number of teleconsultations exploded. The obstacles to the acceptance of this model of healthcare seem now to be lower. Until then restricted to limited experimentations, sometimes with the D system, teleconsultations has been elevated to the rank of miracle cure in a few months. When only some 100,000 remote appointments had been organised throughout 2019, 4.5 million will have been organised for the month of April alone. But this increase does not compensate for all the cure activities. Whereas in mid-March 2020, only 3,000 out of 120,000 liberal doctors in France had recourse to teleconsultations, there were 45,000 at the end of April 2020. But is this a massive and sustainable adoption of teleconsultations or only an episodic wave favoured by short-term measures? It should be noted that we do not really have any information on the evolution of tele-expertise, another key sector of telemedicine [31].

According to Doctolib (an online appointment booking site), in April 2020, consultations had fallen by 44 % among general practitioners and 71 % among specialists, such as ORL specialists, dermatologists, ophthalmologists, etc., whose expertise is not well suited to those who are in a remote situation, and whose income has been strongly impacted. And while some see this aspect of telemedicine as a miracle cure, others denounce the anarchic use of care [32] with the risks of often approximate diagnoses. Another example of possible ambivalence of technology.

Such technological developments foster the way to digital and personalized medicine. According to L. Hood, the concept of 4P

Medicine is composed of 4 dimensions: Personalization, especially with the patient's genetic profile, Prevention, with a global approach for healthcare rather than a focus on diseases, Prediction, with the most appropriate medical treatments for the patient, and Participation, involving the patient's responsibility in his healthcare. Another "P" has often been suggested as 5P with Pertinence or Proofs of the effectiveness of the medical service rendered to the patients, or even "P" as Pathway, with the evolution towards the management of the patients' healthcare pathways. A new "P" may also be considered with the development of Platforms assembling diagnosis, treatment and clinical trial process and connecting the different healthcare professionals involved [33].

6.4.2. The Different E-Health Supports

Numerous computerised medical record projects have been developed. The British NHS (National Health Service) developed twenty years ago an EHR (Electronic Health Record) program. Now the Electronic Health Record System (EHRS) has replaced different systems and paper records with a single, integrated health record [34]. In France, the DMP epic began in 2004. At the beginning, it was presented as a "personal" medical record belonging to the patient, the owner of his or her health data and access authorisations. It became "shared" in 2016 when its management was entrusted to the National Sickness Insurance (in French: *Caisse Nationale d'Assurance Maladie*). It is still struggling to prove its utility.

The failure of the DMP can be explained in several ways. First of all, the DMP has never won the support of health professionals, particularly doctors. This rejection is linked to the specific nature in France of the remuneration of doctors working outside the hospital system (general practitioners or specialists) by means of payment for the procedures performed. For them, the DMP has a two-fold disadvantage: no recognition of a specific paid procedure in order to provide information by entering data for each procedure performed, and also, for fear of a check by the French Sickness Insurance, of the procedures performed and therefore of their income investigation with risk of limitations. Fears (or lack of trust) are always present. Other elements may explain the failure of the DMP. First of all, its technological "solutionism" dimension: it was designed by engineers, without any real consultation with its users. Another negative point is that the DMP does not offer real services. This is quite the opposite of the Diraya computerized patient

record, developed in the Spanish Autonomous Community of Andalusia, which is often cited as a success story. Diraya was designed in cooperation with its users, there has been continuity of the project team over time and it offers services such as appointment scheduling, tele-prescriptions, data and document transfers, etc. and has been developed in cooperation with its users [35].

Always criticised, the French DMP is in competition with other records, such as the pharmaceutical records or the different patient records in different hospitals or private clinics, with crucial questions of traceability of acts based on the interoperability of the systems used. Under the new My Health 2022 (in French *Ma Santé 2022*) law, modelled somewhat on the British Electronic Health Record System, by 1 January 2022 every French patient should have a “digital health space” in which the DMP should be integrated and which should be managed by the National Sickness Insurance. This system, which aims to “accelerate the digital shift” in healthcare, should make it possible to “bring together, on the same platform, all existing services”, so that each user will have access to “all his or her health data throughout his or her life” [36]. These objectives were already those of the DMP in 2004... And many questions remain, and, first and foremost, who will coordinate this platform?

Private companies are also major players in the French Health System, particularly in E-Health, such as Doctolib, which, by acquiring its competitor MonDocteur from the Lagardère group in 2018, has become “the most widely used online medical appointment scheduling service in Europe”. On its site, Doctolib claims to be “the most widely used online medical appointment scheduling service in Europe” by December 2020, with 135,000 practitioner users and 60 million patient visits each month, positioning itself as a key player in “building tomorrow’s healthcare system”. If the service is interesting for patients (with a major risk of digital divide for those who do not have connection tools), some see a risk of “uberisation” of doctors, who may be condemned, to pay a large percentage of their income in order to enlarge their clientele...

There are also medical information portals aimed at the general public, such as the famous health information site Doctissimo (created in 2000) which was sold, again in 2018, by the Lagardère group to the TF1 group (television and media). Doctissimo presents itself on its site as “the preferred health site of the French” with 13.8 million unique visitors in

May 2019. It is also worth mentioning Ameli, the site of the National Sickness Insurance. In addition to the sections Rights and Procedures, then Reimbursements and a Covid 19 section, there is a section on Health, Understanding and Acting, with pages on organisational or digital aspects such as telehealth or the DMP and also with a Sophia service to support the chronically ill.

To fight against compartmentalisation by improving the coordination of medical acts, various cooperation platforms have been set up, particularly in the primary care sector, such as PTAs or Territorial Support Platforms to provide support to professionals in the organisation of complex healthcare pathways. Within the framework of the new *Ma Santé 2022* law, these PTAs should be progressively integrated into DACs or Coordination Support Devices, once again emphasizing the key word of coordination.

According to the French definition (telemedicine decree: 2010), we meet five different types of telemedicine: tele consultation, tele expertise, tele monitoring (for chronic diseases), tele assistance and medical answers for emergency regulation. A telemedicine platform is a connecting device, where the central data repository is related to different interfaces.

In another paper we have outlined the importance of Artificial Intelligence related to Telemedicine activities [8]. Some applications for telemedicine now use machine learning to help the medical professionals with diagnostic support based on symptoms and patient health data. Data Collection before a consultation is also important, such as data for Personalized Diagnosis Support. For example, MédecinDirect is a telemedicine platform that provides medical advice and remote consultations with contracts with companies and mutualist organizations. IA also constitute Decision Support System, used to propose medical recommendations to doctors to avoid of serious risks, for making diagnosis and assisting medical prescription.

There exist other aspects of E-Health or telemedicine that we do not analyse in this chapter. First of all, there is the monitoring in the patients' home: sensors, surveillance systems and calls for help that can be linked to connected objects. There is also the whole dimension of mobile health, which can also be a matter of "augmented man". Finally, there is also the whole field of tele-expertise, remote diagnosis, tele-surgery, which we

have not touched on and which also constitute important issues for Intelligent Systems in health.

6.5. The Inescapable Challenges of the Territories

The management of the French Health System has been progressively regionalised, with a view to the deconcentration of State power but no really decision-making autonomy at regional level (decentralisation), as in Spain for example. Regional Hospitalisation Agencies – ARH, were created in 1996. Within the framework of the HPST law – Hospital, Patients, Health, Territories, they became ARS – Regional Health Agencies, also including primary care. The evolutions are largely due to the digital transformation. From 2014 to 2017, the “Digital Care Territory” (*Territoires de Soins Numérique*) program has thus aimed at the emergence of pilot “territories of excellence” in the use of digital technology to improve and modernise the healthcare system.

The ARS bureaucratic management of the Covid pandemic is highly controversial, probably aggravated by their recent grouping together into 13 new regional entities instead of 22 for metropolitan France. Some are calling for their abolition, others at least for a much more marked recognition of management at the more local level of the départements. For example, the Occitanie Pyrénées / Méditerranée region (since 2016 grouping together the former Midi-Pyrénées and Languedoc-Roussillon regions), which alone has 13 départements, and the New Aquitaine, 12.

The French Health System, which is compartmentalised, must also face significant social and territorial inequalities.

6.5.1. The Challenge of Social and Territorial Inequalities in Health

With the fight against compartmentalisation and the need for coordination/cooperation, limiting social and territorial inequalities in health is a major challenge for the French Health System.

This issue of social and territorial inequalities in health has a double dimension: individual and collective [37]. First of all, social and territorial inequalities in health have an individual dimension, with

patients who may have a combination of different difficulties: often elderly, in a situation of poverty and often even precarious and often isolated, with little contact with the outside world because they live in remote geographical areas (rural areas or anonymous areas of large cities or suburbs) and without proximity to their family, or even without family, and who may suffer from different pathologies (complex patients). In addition to this individual dimension of social and territorial inequalities in health, a collective and territorial dimension can be added with remote (rural) areas or large cities and suburbs. This collective dimension of territorial isolation in health is often summed up by the term “medical deserts”. This isolation can also have a digital dimension: medical deserts can also be numerical deserts. The issue is at the heart of the evolution of cities (which represent 85 % of the French population) and, more globally, of territories.

6.5.2. Smart Cities / Stupid Villages ?

For a long time, some people have opposed “smart” cities with innovative, highly technical solutions to the so-called “stupid villages”. But this is now strongly disputed: can’t the smallest peri-urban and rural territories also implement “smart” or “wise” solutions with local initiatives launched by “small towns”, i.e. towns at the centre of an intermunicipality and with between 8,000 and 25,000 inhabitants [38]? Notably in the context of the “fourth industrial revolution” [39], which is evolving at an exponential, rather than linear, pace, overturning almost all sectors of activity, everywhere in the world. The scale and importance of these changes implies the transformation of entire systems of production, management and governance. These projects have given rise to the drafting of a guide [40] which identifies the main possible obstacles: lack of knowledge of digital solutions, lack of visibility on the cost-benefit ratio of solutions, uncertainties on the interoperability of systems in heterogeneous environments and the classic elements of resistance to change.

The digital revolution can thus contribute to the development of a rurality with a promising future, as shown by the case of the municipality of Tonnerre (7,000 inhabitants) in the Yonne department (Burgundy/Franche-Comté region). Based on networks, everything concerning the protection and safety of people, road safety, traffic fluidity, parking and waste management will see the development of new

applications, corresponding to a whole ecosystem, potentially leading to new activities and jobs [41].

The main sectors of application of the smart city or territory are above all the sectors of flows and networks: mobility and transport to improve fluidity, water and electricity networks, waste management, with the health dimension being relatively little present. However, it is central to the concerns of the inhabitants and certain decision-makers such as elected representatives of local authorities, as shown by the Future Days organised at the beginning of December 2020 in the new Gustave Eiffel University around the central theme of the “city of tomorrow” [42]. The technological dimension should not overshadow the human dimension of the city with the central notion of “well-being”, for a city that is resilient, sustainable, fairer and operating in network with its entire territory and in particular the neighboring municipalities.

6.5.3. A Health Dimension to be Better Taken into Account

The Covid pandemic force to take better account of the health dimension of city projects, particularly with regard to the production, management and use of data, through Intelligent Systems.

At the end of the first wave of the Covid (June 2020), L. Comparat highlighted the importance of reliable data to lead public action, extremely sensitive data with regard to privacy and public safety, particularly in the health sector. She summoned J. Salomon, Director of Health in the French Ministry of Solidarity: “Free access to data relating to the epidemic, what is known as open data, ensures the confidence of citizens in the elements communicated to them, promotes preventive actions against the spread of the virus and facilitates decision-making. The dissemination and exploitation of this data has been made possible thanks to close collaboration between several administrations and civil society”.

Faced with the centralized State’s difficulty in providing immediate and appropriate solutions, with the globalization of production and information, the centralized approach has shown its limits in times of crisis (which has always been the case). The involvement and creativity of local actors have made it possible to imagine quick solutions, adapted

to the local context and diversified. For L. Comparat, these solutions have shown that territories have been at the heart of “productive resilience” [43].

Interesting initiatives have been developed in the territories in the E-Health sector. To combat medical desertification, the departmental council of the Ain department (Burgundy / Franche-Comté) has decided to finance the salaried recruitment of the equivalent of four full-time doctors who will work in voluntary MSPs (*Maisons de Santé Pluriprofessions*) or with private doctors in areas with medical under-density. Ain has also decided to bet on telemedicine solutions by setting up 5 teleconsultation booths in the department [44].

One of the major challenges of medical desertification is that of helping and caring for the elderly. It is often carried out in the homes of these people, with the whole issue of family careers. They are also, in towns and even in large villages, residents of Hospitalised Establishments for Dependent Elderly People or EHPADs (*Etablissements d'Hospitalisation de Personnes Agées Dépendantes*). Older people are the main targets of the Covid epidemic: 92 % of the cases of Covid-19 deaths are over 65 years old. The pandemic was of course the main cause of these deaths. But the complete abandonment by relatives, in spite of the efforts of care workers (telephone, Skype or Zoom links, etc.) to maintain a link, may have played a role which has been reported. This raises the question of the evolution of EHPADs.

At the same time, the activities of associations providing care or home help have increased. After the “ambulatory shift” to provide more and more care outside hospital structures over the last thirty years or so, there has been an increasing talk of a “home shift”: caring for patients in their own homes.

The issue at stake is more and more home care. In order to encourage patients to remain at home, support platforms have been developed. In Bordeaux, a “Seniors’ Autonomy Platform” is a local and listening centre located in the city centre. It enables people over 60 years of age to find out about all their rights, to help them with all aspects of daily life, such as health, meals on wheels, domestic help, the quality and comfort of the living environment or social and cultural life. This “one-stop-shop” has the task of providing information to older people, professionals and their families. It brings together three complementary

mechanisms to promote the autonomy of older people: the Local Information and Coordination Centre – *Centres Locaux d'Information et de Coordination* (CLIC), the Action Method for the Integration of Assistance and Care Services in the Field of Autonomy or *Méthode pour Améliorer l'Accompagnement des Personnes Agées* - (MAIA) especially for Alzheimer patients and the Territorial Support Coordination (CTA), which ensures the operational functioning of the new PAERPA – *Parcours de Santé des Aînés*, mechanism for the prevention of loss of autonomy of people aged 75 and over [45]. The “Autonomy Seniors” platform thus brings together different interface organisations. We will discuss their specificity and their importance for a local response to the territorialisation of health management later on.

6.5.4. Developing Territorial Resilience

The types of intermediation solutions analyzed correspond for us to tools for “territorial resilience” be based on digital devices as Intelligent systems. Resilience can be defined as a “capacity to overcome traumatic shocks” [6]. The notion appeared in the 1950s, in the physical sciences sector, to designate a material that returned to its original form. It was then taken up by psychology, for individuals who had to react to a traumatic situation. It then progressively took on a collective dimension for groups, organisations, territories, etc.

The use of digital devices and data has become a national issue in all countries. In France, the law for a Digital Republic (*République Numérique*) was promulgated in October 2016. It was based on a long period of consultation and through a national consultation on the challenges of digital technology and an online consultation on the text of the draft bill. It emphasises the circulation of data and knowledge, with the importance of open data. The protection of rights in the digital society is also emphasised. The text also insists on digital access for all and in all territories [46].

In November 2019, a new Agency for Territorial Cohesion or *Agence Nationale de la Cohésion des Territoires* (ANCT) was created, taking over former administrations (such as the former DATAR: Delegation for Regional Planning and Regional Action or *Délégation à l'Aménagement du Territoire et à l'Action Régionale*, created in 1963) [47]. In particular, it insists on the role of small towns as “cohesion territories at the heart

of the recovery”, especially with the challenges of the Covid pandemic. The whole question of the “resilience” of the territories is raised, territories that often feel abandoned by the political power and that have been at the heart of the revolt of the “Yellow Vests or *Gilets Jaunes*” since November 2018 [48], against the closure of public services, notably schools or hospitals, or the reduction of their means, what C. Guilluy has described as “peripheral France” [4].

L. Comparat [43] insisted on the importance of reliable data to lead public action, with services adapted to times of crisis. For her, territories are at the heart of “productive resilience”. She stressed that many local authorities have had to find solutions to meet such legitimate demands as open shops (Issy-les-Moulineaux), chemists (Ile-de-France), local producers (Dunkirk), open services (Corsica), Smart Services (Ile-de-France). In many cases, local authorities have relied on citizens to co-produce this data, for example with the OpenStreetMap initiative (caresteouvert.fr). Even within the local authorities themselves, the services have had very significant needs for internal data in order to manage their actions: feedback on health data, but also on the number of pupils in schools, the size of cycle lanes and pavements, authorisation to occupy public spaces, tourist offers, geographical data of all kinds. The public powers noted on this occasion the importance of simplified, structured and systematic access to all the data they produce or handle. L. Comparat pleads for a better use of data: “Since the period commits us to it, after long years of confinement of public data with the social and economic consequences we can imagine (restriction of exchanges, limited horizon, worries, false information, slowdown of activity), it is time to de-confine the data! Let’s amplify the open data movement”!

On the territories, the health crisis of the Covid strongly calls into question the meticulous bureaucracy of the ARS and the “nomopathy” or obsession with norms, standards, traditional in France, which has blocked initiatives, provoking ubuesque situations. Initiatives, often modest, have been set up at local level, showing its resilience and adaptability. In the PACA region (Provence-Alpes-Côte d’Azur) health professionals have set up WhatsApp exchange groups, which may prefigure new CPTS (Territorial Professional Health Communities or *Communautés Professionnelles Territoriales de Santé*) desired by the public authorities, bringing together hospitals or clinics, EHPADs, various interface organisations, liberal primary care professionals, etc.

[29]. We are thus in a logic of “day-to-day innovation”, the importance of which was emphasised by N. Alter [49].

But there are obstacles to the development of this cooperation [29]. The first is the founding choice to pay health professionals on a fee for each service given to patients, which dates back to 1927. It is therefore in the interest of health professionals to retain their clientele of patients and therefore not to exchange less information. There is also the whole issue of medical secrecy, which is rarely shared, and medical responsibility, which remains individual and little yet collective and shared, an important development that is beginning in interface organisations. There are also the issues of traceability and interoperability of the digital devices used.

Whatever choices are made to improve the health system, it is essential not to lose sight of the patient’s interest and service, which Shortell et al. (1996) illustrated with the verbatim words of a patient they met in a waiting room: “You know, I have a pretty simple wish. I want to stay healthy and productive. When I become sick I want to get well as quickly as possible. But I know that costs are also important. So I want to know what’s done to me is really needed and is done as efficiently as possible. Do you think that’s too much to ask for ?” [50].

For many years now, our society has largely become a “society of mistrust” [3], particularly in the health sector, with a succession of scandals that can be analysed as “State lies” (amiante, contaminated blood or *sang contaminé*, Chernobyl, etc.). The shortage of masks in the face of the Covid health crisis and the often contradictory communication of the public authorities to blur it have further aggravated the mistrust of citizens since the spring of 2020. An essential challenge is therefore that of (re)building trust between all the actors at all levels and in the use of digital devices. And the first stage is that of removing fears, as proposed by Le Cardinal, et al. [28] with the FAcT or Fears – Attracts – Temptations in Mirror method, particularly in complex projects such as the implementation of information systems. The FAcT method is based on word-sharing workshops in which the different actors formulate and discuss their “fears” with each other and try to remove them by listening to the other actors. But, as C. Senik et al [51] outline, crises of trust imply to work for the construction of other modalities of confidence. If it is therefore important to analyse the way in which it is

weakened, or even destroyed, it is also necessary to grasp the ongoing production of trust in new forms. In this perspective, it is necessary, as M.-J. Thiel [52] emphasises, to preserve the full human dimension of care, avoiding the risks of bureaucratic and technical excesses of technological “solutionism”.

The Health Interface Organisations (HIO) developed over the last thirty years in France between the primary care and hospitalisation sectors can be seen as areas for innovation and the development of trust around new cooperative practices.

6.6. The Lever for Innovative Experimentations in Healthcare Interface Organisations (HIO)?

We have already stressed the importance of developing coordination, particularly with shared tools, but for us, coordination is only a step, certainly fundamental, but must lead to cooperation, built around common collective practices and shared values, in the service of improving care for the patients, with for example all the importance of setting up interface organisations.

6.6.1. Setting up Interface Organisations in Healthcare

From the perspective mentioned at the beginning of this article and from the start of our works on the health sector [13], we have approached these interface organisations as “border spaces”, corresponding not to barriers or walls (partitions) but to “membrane” border spaces, spaces for exchanging practices, for complementarity of approaches, for “cross-fertilisation” and therefore for developing cooperation around shared representations and through organisational innovations.

Health Networks (*réseaux de santé*), with a desire for a global approach (complexity) to health and social issues and not just care, developed at the end of the 1980s, as spaces for practical innovations, in primary care with doctors (often in the poor suburbs) who defined themselves as dissidents or “secant marginals” in relation to the hierarchical system of the hospital (hospital-centrism) which hardly recognised them. The crisis of the AIDS pandemic from 1984 onwards, which neither the hospital system nor traditional urban medicine in primary care really knew how

to deal with, “Health Networks” developed against another approach that of “coordinated care networks” on the model of the American HMOs (Health Maintenance Organizations), long favoured by the National Sick Insurance (1996 decrees). Alongside the AIDS Networks, other primary care / hospital networks, with a generalist vocation (coordination of care), or dedicated to specific pathologies (diabetes, oncology, asthma, infant bronchiolitis, etc.) or specific situations (perinatal care, palliative care, etc.), developed. The law of 4 March 2002 on the Rights of Sick People and the Quality of the Health System or *Droits des Malades et Qualité du Système de Santé*, enshrined the role of Healthcare Networks, including the “health democracy” dimension, supported by patients’ associations, in particular AIDS patients’ associations, with patients asserting their role as full and recognised actors in the Health System. This is the “empowerment” of patients in Anglo-Saxon countries. France is still a little behind the times and talks about giving more responsibility to patients, which is not exactly the same thing as empowering them...

It is worth emphasising the dual dimension of organisational and social (and day-to-day) innovations in Healthcare Networks, with their global approach to the patient in his or her environment, as opposed to a more sector-based approach, with a “broken” or “fragmented” patient. These Healthcare Networks have often had a social dimension in the difficult neighborhoods of the suburbs of large cities (Créteil, Saint-Denis, etc.). Coordinated care networks corresponded rather to organisational innovations, very much focused on the coordination of care and reducing costs.

From 2006 onwards, Healthcare Networks were called into question, with the public authorities favouring MSPs or Multi-professional Health Centres or *Maisons de Santé*. These are in fact two different ways of practising medicine. The Healthcare Networks bring together private practitioners with their own individual practices, while the *Maisons de santé* are grouped together for the purpose of medical practices, but often only by sharing resources (buildings, phones, secretariats, etc.). Most private practitioners now work in group cabinets, but few in MSPs. There were 910 MSPs in 2017 (compared to 36,700 doctors’ offices, and more physiotherapists and nurses) with as many dental surgeries, compared to 436 in 2014. The objective is to have 2000 MSPs in 2022. They now

concern 13096 health professionals (and not only doctors) who have seen 3.2 million patients [53].

Hospitalisation at Home or HAD (*Hospitalisation à Domicile*) is the oldest interface organisation. It has developed considerably and is now recognised as a hospitalisation modality in its own right. There were 313 home hospitalisation establishments in 2016 compared to 170 in 2006: 16300 people can now be hospitalised at home simultaneously compared to 6900 in 2006 [54].

It is also worth mentioning the home help sector, including the care sector: SSIAD (Home Nursing Services) and PSAD (Home Health Care Providers).

Other interface organisations are mainly information, networking and coordination organisations, such as the CLICs (Local Information and Coordination Centres), the MAIAs (now a method for improving support for people aged 60 and over) set up by the CNSA (*Caisse Nationale de Solidarité pour l'Autonomie* – National Solidarity Fund for Autonomy) as part of the Alzheimer's plan. There are now 352 MAIAs schemes in almost all of France. Since 2014, PAERPAs (or senior citizens' health pathways) have also been developed to preserve the autonomy of the over-75s. Since 2019, CLIC, MAIA and PAERPA have been gradually integrated into the DACs (Coordination Support Systems). In each new system (set up while keeping the previous ones...), we find the magic words of “pathway” and “coordination”.

6.6.2. A Strong Challenge of Clarity and Complementarities around New Forms of Cooperation and Integration

A report by the General Inspection of Social Affairs – IGAS (2020) on Home Services Providers outlines that they correspond to “a sector that is very heterogeneous in its composition and practices, whose rapid development is difficult to regulate, which provides real services, but whose expansion strategies are questionable”... then insisting on “a twofold necessity...”: to strengthen guarantees in terms of quality, safety, ethics and the relevance of the use of public finances, to clarify their place in the Health System, in line with the National Health Strategy and in complementarity with the other actors” [55].

This has been a constant comment for many years. Although the various Healthcare Interface Organisations provide important services to patients, they lack clarity and are not very familiar with their respective activities, and even where they are often in strong competition, with accusations of “client capture”, particularly in borders activities between Hospitalisation at Home and Home Care Companies (*Prestataires de Santé A Domicile*) [29].

There is indeed – and this is paradoxical to say when these systems were created to fight against existing compartmentalisation! – a risk, and unfortunately sometimes even a reality, of the development of new partitions... A recent online seminar [29] insisted on the need to get to know each other better and first of all to draw up a map of the actors in a territory (!), which could be a task for the departmental delegations of the ARS... We can take the case of an elderly person at the end of its life with the coordination of the action which may be possibly taken by different actors with very blurred boundaries: MAIA, PAERPA, HAD, palliative care networks, or cancer networks...

Bloch-Henault had already stressed this need for clarity and integration of the activities of these different systems [56]. The setting up of the DACs corresponds to this objective. But who will steer them? How will these DACs fit into the CPTS (Territorial Professional Health Communities), which bring together hospitals, clinics, EHPADs, Interface Organisations, etc., in the same territory?

With the words “coordination” and “pathway”, the one that comes up most often is “trust”: there is no (re)construction of cooperation without trust. And it is precisely to encourage the development of cooperation based on this trust that the new Healthcare Interface Organisations were created. The challenge now extends to the DACs and CPTS. These challenges are above all communication and information challenges: cooperating by sharing information to improve services to patients in a territory. How far will these organisational recompositions go?

6.6.3. A Hybridisation of Professions?

All these developments are also challenging the boundaries between professions, often formulated in “job descriptions” and “specific roles”, of the doctors, the nurses, etc., and are giving rise to new ones.

We have already studied the job of coordinating Healthcare Networks or any other Interface Organisations and its information (data collection and use) and communication (negotiation, conflict management) dimensions, with now the whole issue of GDPR (General Data Protection Regulation). The profession of nurses, often coordinators of networks or other interface organisations (with skills not only in health, but also in management and information-communication), has diversified beyond care: nurses are cases managers, pathways managers, i.e. professions of intermediation, interacting with patients [57]... At the same time, quality approaches (process approaches) are increasingly integrating patients' roles: discussion groups, patients – tracers, patients – experts, etc.

The evolution, by breaking with the Cartesian model and the division of labour into very specific tasks, is now pushing towards the hybridisation of professions and multi-skilling perspectives, which is likely to cause tensions and conflicts.

6.6.4. The Importance of Evaluation (Assessment)

A European Commission's report recently strongly insists on “to include resilience as a key dimension of performance assessment with access, quality and efficiency of care measurements” [6]. The report advocates for “formative and summative evaluation” with effective Information Systems.

For about twenty years, we have worked in this perspective in Healthcare Interface Organisations (HIO) Information issues (production, storage, uses of data) are essential both for diagnosis and health monitoring (traceability of acts) of patients (micro level), but also for the management of organisations and services (meso) and for the Health System as a whole (macro).

First of all, there is data for diagnoses, but also for the evaluation of acts carried out with the whole question of the “medical service provided”, giving patients their full role based on quality of life questionnaires.

Within the framework of quality approaches, Healthcare Organisations are certified and evaluated, in particular by the High Authority for Health – *Haute Autorité de Santé* (HAS). More specifically, we have been

working on a new approach of “contributive” evaluation, with a view to continuous improvement (the idea of the Japanese “kaizen”) by involving all stakeholders, including patients and their families, with an emphasis on the information (construction of a set of significant and accepted indicators and data) and communication (interactions and shared meaning) dimensions [58].

6.7. Conclusion

The French Healthcare System, already in crisis, has been strongly shaken by the Covid crisis. In a context of digital transformation, Intelligent Systems, largely corresponding for us to digital devices: portals or platforms for information, decision support, monitoring of patients at home, computerised medical records, telemedicine and teleconsultations, artificial intelligence for diagnostic assistance, etc. These digital devices contribute to new approaches to 4 or 5 P, or even 6 or 7 P medicine (Personalization, Prevention, Prediction, Participation, Relevance, Pathway, Platform).

We have underlined the possible ambivalent nature of the current developments. These digital systems, while they may improve the quality of care and services provided to patients, may also lead to forms of technological “solutionism” and to a risk of rationing care, in order to reduce costs, at a time of exacerbated budgetary constraints favouring bureaucratic and normative approaches.

The major issues proclaimed with the keywords of pathways, coordination and cooperation all converge on the implementation of Intelligent Systems in different forms. We insisted on the essential dimension of trust between all the actors, but also in all digital devices. By insisting on the human dimension in healthcare, digital devices or Intelligent Systems must help to improve the quality of care and services provided to patients, who must be more involved in their development and implementation. Initially, it is a question of removing fears and mistrust between all the actors or groups of actors but also in the use of the tools (risks of exacerbated controls, rationing of care, etc.).

We insisted on the importance of practical solutions, with the challenge of their anchoring in the territories, with all the social and territorial

inequalities in health and the role of interface organisations as spaces for experimentation and (re)building trust, relying on socio-technical devices, often corresponding to Intelligent Systems interactions with users.

The Chinese ideogram representing the word “crisis” has a double meaning of risk and opportunity. This is particularly the case of the current health crisis of the Covid pandemic. Although it has strongly shaken up the French Health System, it has also highlighted malfunctions and brought about innovative solutions thanks to the cooperation of all the actors in the territories and, often, by making better use of digital devices perspective.

This crisis can therefore be a major factor of “resilience” in Health System. However, all is not won and the risks of bureaucracy taking back control are very real. The future will tell us whether, by making better use of Intelligent Systems, the current health crisis of Covid will lead to real “resilience”, defined not only as the ability to overcome an ordeal, but also to emerge positively from it by transforming itself to improve the service provided to patients, of the French Health System.

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