

Managing Patient Records in Complex Systems in Time of Epidemics

The Predominance of Human Aspects for Quality of Processes

Eloria Vigouroux-Zugasti, Christian Bourret

Laboratory of DICEN IDF
University of East-Paris Marne-la-Vallée
Val d'Europe / Serris, France

Email: eloria.vigouroux-zugasti@univ-eiffel.fr,
christian.bourret@univ-eiffel.fr

Sylvie Parrini-Alemanno

CNAM
Paris, France

Email: sylvie.parrini-alemanno@lecnam.net

Abstract — With the recent promulgation of the General Data Protection Regulations, data management is becoming a crucial strategic issue in organizations. The quality of data dissemination is of utmost importance in the healthcare environment. Indeed, medical confidentiality is closely linked to the dissemination of personal information inherent in the patient's record. Yet, how can a complex system, composed of multiple multidisciplinary actors (medical, paramedical, administrative, etc.), deal with the potential disclosure of personal data? What steps can be taken to manage this risk? With the current health crisis of the COVID-19, those questions become essential. Medical confidentiality and crisis management has to deal with massive ethical issues related to the use of personal data. The interoperability of professionals and the quality of care are more crucial than ever, considering the need to limit the spread of the virus. To answer these questions, a case study was conducted in the Multidisciplinary Care House of Mimizan (France, Landes, New Aquitaine Region). The goal was to investigate the importance of human and data management for traceability of care and for crisis management. This medical organization is composed of medical and paramedical professionals, but also a relatively large administrative team for such an institution. The results highlight that this organization manages to set up, at the initiative of the professionals, both flexible and structured processes, allowing optimal follow-up of patients, while guaranteeing respect for their personal information.

Keywords — Health; Data; Patient Records; Quality; Crisis; Human Relationship; COVID-19; Territory; Organization.

I. INTRODUCTION

The management of personal data, with the recent promulgation of the General Data Protection Regulations (GDPR - May 2018), becomes a crucial and strategic issue for organizations. In the healthcare sector, respect for medical confidentiality is closely linked to the dissemination of patients' personal records. Data has to be managed with great care in order to limit the risk of unfortunate disclosure or data loss. Data management in health organizations depends on both technical and human factors, which are closely related to each other. Technical aspects (storage, access, sorting, etc.) would only be efficient if they are linked to a human data management policy (uses guidelines, access ethics, conditions of diffusion inside and outside the organization, etc.).

However, the current French healthcare organization tends to evolve to a collaborative working method, as some researchers have been able to show in their studies [1]. For the past ten years, French health authorities have been witnessing the emergence of some new organizations of health professionals and the exponential growth of groups of (para)medical professionals, attesting the growing complexity of health organizations [2]. This is particularly the case for Multidisciplinary/Multiprofessional Health Houses (MCHs), with 910 establishments active in France in March 2017, compared to only 240 in 2013 [3]. These establishments are complex because of the number of interacting actors they involve. They also tend to rely on the notion of sharing and circulating data, especially health information about patients. In doing so, they tend to improve patients' health care and health monitoring.

The current health context tends to intensify the difficulties in the management of health in France - and *a priori* in the whole world also. This is why reflections and practices related to the management of personal records, especially from a human point of view, must be intensified. Indeed, health professionals are under intense pressure. Lack of trust in the organization, organizational malfunction, team tensions, exhaustion, stress and fear of being contaminated represent high risk factors that could lead to (un)voluntary misuse of personal records. For health organizations, it is critical to find solutions to preserve their quality. It is also critical to remain scrupulous with the protection of data crisis in order to guarantee the quality of care, while protecting patients' records and especially those who are contaminated.

How could both technical and human processes guarantee medical confidentiality and manage the inherent risks linked to data disclosure, while ensuring the interoperability of professionals and the quality of care, in time of crisis? It seems that the challenge is mainly about the ability of the French health system to increase its level of performance [4]. The challenge also rests on the ability of collaborative organizations to hold their staff together, despite the pressure they have to work with.

To answer this question, a first case study was conducted in the Multidisciplinary Care House of Mimizan (MCHM). To do so, an exploratory qualitative approach was conducted via focus groups with the whole team of the institution and

via an interview with its two managers. The goal is to establish an inventory of practices, particularly in terms of data quality management in complex health institutions. The analytical approach presented here is based on the structural level of MCH actions, in which resources (human and material) are mobilized to ensure a good coordination for patients' care and confidential data policy [5]. MCHs are a recent and emergent phenomenon, with heterogeneous ways of working. The goal of this article is to explore one of the biggest and formalized MCH, from an exploratory point of view, in order to understand its organization and its capacity to be considered as a model for other MCH. A second phase of the survey was conducted following the same methodology, when the French government declared the state of emergency to protect the population from the COVID-19 epidemic, on March 12, 2020. The goal is to compare the ordinary processes to the crisis ones and to deepen the human aspects of data management.

Section II is dedicated to the overall contextualization of the study. Section III presents the institution selected for the study, the MCHM to show how it is representative of the new healthcare institutions needed in fragile territory. In Section IV, the article analyzes the quality processes inherent in the management of this institution's data. The Section V presents the specifications of the MCHM. Section VI provides details on the general lack of use of the national digital health record. Sections VII to IX are dedicated to the second phase of the survey, related to the adaptation of the MCHM to the COVID-19 health crisis. Section VII concerns the hypertelic aspects [6] of organizational processes in the field of public health – that is, organizational processes hyper-adaptive to their context but which may become impossible to adapt if the context changes. In Section VIII, the evolution of organizational management is developed. Section IX presents the model of collaboration and interdisciplinary cooperation as a necessary step to succeed in time of crisis. We bring a conclusion of our analysis in Section X.

II. STUDY BACKGROUND

In this section, the study background is explained. The specific context of the current French public healthcare context and policy are also detailed for a better understanding of the study.

A. Challenging health context

In 2014, the population density of Landes department fluctuated between 2 and 45 inhabitants/km², with an aging index among the highest in the region [7]. In 2015, 31.5% of Landes' population was over 60 years of age, a great increase compared to 2011 [8]. According to the Regional Health Authority – RHA (in French, *Agence Régionale de Santé*), in 2016, the rural population represented more than 50% of the whole Landes population. In addition, this region also has a medical demography and a density of specialists lower than regional and national averages, as well as a small number of healthcare establishments. It also has few alternatives to the nursing homes for old people [7]. Therefore, old people's loss of autonomy is more difficult to manage. According to RHA, 1/3 of liberal general

practitioners were over 60 years old in 2017 [9]. This is a very problematic issue: combined with the difficulties of attractiveness of the territory, it becomes more and more difficult to maintain the number of practitioners in this area. The RHA demographic patterns of Landes health care show a highly unfavorable public health context:

- White areas (towns located more than fifty kilometers away from a hospital emergency department), combined with an insufficient number of expert services (radiology, rheumatology, gynecology, allergology, pneumology, dermatology, etc.)
- Medical desertification: unattractive territory for young (para)medical professionals (region's remoteness from large cities, low internet coverage, few cultural offers, etc.). Doctors are struggling to find successors, despite administrative provisions and facilitations offered by health authorities.
- Fragile areas: unequal distribution of health professionals in areas with an imbalance between the number of potential patients and the number of doctors, as well as areas where the advanced age of patients (or the doctor) would require urgent decisions.

Facing these difficulties, some political representatives try to shed some light on the issue of medical deserts: in October 2018, the mayor of a small town called Ychoux proposed to prohibit, by municipal decree, his fellow citizens from falling ill, due to the lack of medical care in its surroundings. The study was conducted in this area for its relevance concerning the challenges France will have to face in the coming years. The main problem in France is getting young medical staff to settle in countryside areas, where living standards are less attractive than urban contexts.

B. Management of de-materialized health data in a complex system

Personal records, such as medical data, defined by the French Data Protection Act, called *Loi informatique et liberté*, (cf. paragraph 2, article 2 of the Act) as an information relating to a person who is physically identified or who can be identified, directly or indirectly, by reference to an identification number or to one or more elements specific to him/her [10]. In addition, this data must be processed in order to make sense. This process is defined by the same law (cf. paragraph 3, article 2 of the Act) as a transaction or set of transactions, whatever the process used [10]: collection, recording, organization, storage, modification, consultation, communication by transmission, etc. Data are also part of an exchange, characterized by the provision to several professionals, such as health staff, who are entitled to know everything about these data. Their goals are to insure the coordination and continuity of patients' medical care [11].

However, the exploitation of personal records remains a sensitive subject. It directly affects the privacy of each individual [12], especially when it comes to medical data. In complex systems, such as MCH, there are several issues related to the management and to the protection of health

data. From an organizational point of view, it is essential to set up procedures to secure access to data. Those procedures tend to limit the structural disorders that can affect the confidential standards of data, by establishing, for example, quality indicators. Measurement and management tools in health establishments are essential [4]. In addition, complex systems have a large number of stakeholders, but they do not have the same level of data access authorization. It increases the risks of fraudulent or accidental access to information.

With the multiplication of MCHs, the French health sector must now face a multitude of risks related to data, which require close scrutiny of each elementary activity [2]. These establishments are the result of a clustering of health professionals who, until now, had been working alone. However, using common resources and administrative staff lead professionals to rethink their working methods, while insisting on control and rigour. The various stakeholders in the project have to develop fundamental procedures for collaborative work. This aims at reducing and optimizing work processes [2], while considering the topics of control and quality as the heart of these processes. Professionals, in this new context, must demonstrate that their services are delivered in a secure environment. This environment helps controlling the risks and meet the expectations/requirements of patients [4].

C. *Multidisciplinary health centre: although need for a restructured health policy – from a political point of view*

MCHs are a model that catalyzes needs, from health professional, public decision makers and patient care points of view [5]. The creation of this type of institution represents the convergence of three complementary processes, identified by Autès and Dufay [13]:

- Movement initiated by healthcare professionals to gather their activities within MCHs and health centers.
- Reflection of local officials, concerned by the management of health in their districts, involved in logics of prevention, of permanence of care, of first aid and the continuum between outpatient services and hospitals. They also care about offering external and specialized consultations to the people living in areas where there is a shortage of health practitioners;
- Necessary reorganization of the supply of care due, first, to the constraints of modern medicine and pathologies and, second, to the effects induced by the anticipated decline in medical demography.

From a territorial point of view, the MCHM aims at meeting the four standards of public health action: 1) maintaining a local offer, 2) guaranteeing equal access to health for all, 3) ensuring continuity of care between the primary care offer and graduated hospital care 4) and, finally, strengthening health prevention policies. For local officials, the issue is to strengthen weakened health districts and care offer [13], by proposing long-term ways-out to solve the current problems. In addition, since MCHs are subjected to accreditation rules, by responding to quality

indicators established by public health authorities [13], they contribute to an increased performance of districts' medical management.

III. METHODOLOGICAL APPROACH

In this section, the sampling and methodological procedures are presented.

A. *Why Study the MCHM?*

By definition, MCHs depend on specific contexts. It is important to identify the territory's needs, to take into account the needs of its population and its state of supply. MCHM is considered as representative of this movement of territorial restructuring in the field of healthcare both in its conditions of implementation and in its daily functioning, structured around the interrelationships between territorial stakeholders [5]. Indeed, despite its recent implementation, it manages to meet the whole public health objectives, both mandatory and optional, imposed by the "RHA Inter-professional Agreement" contract, particularly in terms of shared information systems, which are at the heart of the challenges related to data quality. The dynamic of the creation of the MCHM was, in the first place, launched by healthcare practitioners themselves, in reaction to the progressive desertification of their territory and the challenges it involves [13]. The project of creating the MCHM began in 2004. The district's doctors wanted to cluster their activities in a single establishment, to pool their administrative tasks and to offer a better access to care for their patients. This approach is in line with the observations of some researchers, who state that medical desertification in rural areas has been the main motivation for the mobilization of health professionals [13]. One of the main problems lays in Landes' unattractiveness for doctors. The mere proximity of the beach and the "sweetness of life" are not enough to attract young professionals willing to settle down. It is necessary to provide health professionals with some attractive and secure professional conditions of practice.

However, the notion of attractiveness of the project is very important here [5]. Offering a young professional an isolated practice in a small town does not have the same appeal as a long-term position in a MCH, in which he or she could be supervised, advised and supported by administrative services, surrounded by colleagues and supported by financial and material resources. Collegiality and plurality of perspectives make the medical practice both more reassuring and richer [13], especially at the beginning of a career. This is the appeal proposed, in general, by MCHs and, in particular, by the case studied in this article, which is one of the biggest and dynamic MCHs in France. Its professionals have been recently asked to present their institution in the next National French Congress of MCH. This type of organizational dynamism is a movement widely desired and claimed by the younger generations of medical and paramedical professionals [14].

Moreover, Landes is the largest region of France, with a mainly rural territory and offers most of the current and forthcoming public health services presented in the contextualization part of this article. Having such an

innovative MCH in this kind of area is an example of how to deal with public health issues in other regions in France, especially concerning the rural ones.

B. Methodological Approach and Sampling

The survey was conducted from the 8th of December 2018 to the 10th of March 2019. This period provides two main contexts: seasonal epidemics (the flue in January and spring allergies in March) and quiet period in December and February. It seemed relevant to investigate the MCHM in both these contexts in order to deepen all the aspects of its organizational data management. At the beginning of the survey, the goal was to identify the organizational model and rules implemented by the MCHM's team, specially concerning working processes and data management. To do so, a qualitative approach has been chosen. This method has been selected for its ability to investigate the practices and interpret the results. It considers that the "confrontation with the corpus is a necessary condition for the perception of social practices" [14]. The goal was also to confront the different points of view concerning the organizational processes. The potential divergences and discordances regarding the positions can be highlighted. Does a secretary think the same thing of the establishment than a doctor or paramedical worker? Concerning data privacy management, the heads of the MCHM in charge have been interviewed. They had to explain their choices in terms of data management policy, of coordination put in place and of emergency plans in case of unfortunate disclosure.

Regarding the questions, all the members of the MCHM staff we asked about two common topics. The first was about the daily-work and its organization, both concerning the inner-group and the relationships with the other members of the MCHM (for example: secretary-secretary, secretary-medical, etc.). The goal was to highlight relational and organizational dysfunctions. Secondly, all the staff members were asked about their own professional uses of patients' health records, in terms of access of use and of transmission. The purpose was to identify good and problematic uses.

The second questions asked for some more specific topics. The goal was to have a better understanding of each specific staff members (medical doctor, paramedical, administrative, etc.), to point out the benefits and the limits of their new work, management and organizational processes since they entered the MCHM. Four focus groups took place in December 2018 and February 2019, with the four specific staff members. Then, interviews were conducted in January 2018 and March 2019, with the head of the administrative staff and the heads of the MCHM. They all were realized in the MCHM, in the meeting room. The goal was to make the people feel comfortable and to prevent conversations from being heard by the patients or the other staffs' members. This approach seemed relevant, as it helped people to speak freely.

A second phase of the survey was conducted during the COVID-19 crisis, from the 12th of March 2020 to the 11th of May 2020, in the same organization. This period corresponds to the riskiest period of the pandemic, from a public health point of view, when France reached its highest rates of virus spread. It also corresponds to the most difficult time for

public health organizations, which have had to adapt urgently their processes to face this situation they never knew before. For the sake of homogeneity, it was decided to use the criteria and distribution initially used for the first phase of the survey in order to compare the results. It was also decided to conduct the interviews by teleconference. The goal was to limit the risk of exposure to the virus and to make the survey as smooth as possible for the MCHM staff.

C. Health Records Management in the MCHM

TABLE I. DISTRIBUTION OF THE INTERVIEWED SAMPLE

Criteria	Distribution	Number	%
Gender	Male	14	51.9
	Female	13	48.1
Age	25-35	6	22.2
	35-45	7	25.9
	45-55	8	29.7
	55-65	6	22.2
Professional activity	Medical doctors	11	40.7
	Paramedical staff	8	29.7
	Administrative staff	5	18.5
	Executive of administrative staff	1	3.7
	Executive of the MCHM (also doctors)	2	7.4

As Table I shows, the MCHM brings together three main crews: doctors (8 + 2 regular substitutes + 1 trainee), paramedics (3 nurses and their collaborators, 2 physiotherapists, 2 podiatrists, 1 psycho-motor therapists, 1 dietician) and administrative staff (5 secretaries, only working for doctors, managed by an executive). Including trainee doctors and nursing staff, the sample is composed of thirty individuals involved in the daily operations of the MCHM. They are all subjected to the institution's collective agreement, in which respect for medical confidentiality is clearly enshrined. Data is managed and stored on a specific medical database software, Weda [15], which is also used by the surrounding external collaborators (pharmacies, specialists, hospitals, etc.). The choice to use the same software aims at facilitating the medical and administrative aspects concerning the caring continuum. Each member of the MCHM has secure access provided by the software. These codes are not stored on the institution's digital devices in order to limit the risk in case of theft or hacking.

However, not all MCHM members have the same level of access to patients' records. Doctors, as well as their secretaries, have full access to all the information concerning: files, auxiliary session schedules, secure messaging, etc. This is justified by the need for doctor/doctor

and doctor/secretary interoperability, for the smooth functioning of the MCHM and good patient care. At the request of a patient or a staff member, restrictions may be applied to limit secretaries' or doctors' access to some records. All patients were asked about this sharing consent.

Then come the paramedics, with a diffusion specific to each specialty. Their access is conditioned by the needs of their activity. A physiotherapist, for example, will have access to the patient's x-rays and related prescriptions; a nurse will have access to history, specialist contacts, blood test results or vaccines, depending on needs. These professionals do not have access to the content of visits, letters, prescriptions, unless some specific case discussed with the doctor. The accreditation of external professionals is aligned with the system applied within the institution, according to the needs of the patient, the activity or the specialty. Collaborative patient follow-up is governed by Multi-Professional Consultation Meetings (MPCMs), planned or impromptu, attended by all the professionals involved in the presented case. Each meeting is documented, stored via Weda and only accessible to the concerned professionals. Doctors and secretaries meet weekly to monitor performance and improve organizational quality processes. The doctors interviewed also associate these meetings with team management (trust, accountability, etc.), to ensure cohesion among all workers and to involve them in the administration of the MCHM.

This institution is a motivated and voluntary grouping of health professionals, in a singular and innovative organizational form. As a result, this configuration will have to be closely observed in the years to come in order to evaluate its lean management in data management and its mode of transactional relations, perceived as co-constructive interactions.

IV. ANALYSIS OF DATA MANAGEMENT PROCESSES

This section is dedicated to the analysis of MCHM data management concerning patients' records. Thanks to the study, the main protagonists of this type of management tasks have been identified, such as the governance of the establishment, from a managerial point of view.

A. Data Ethics and Dissemination Quality

An organization can be defined as a set of recurring transactional programs that constitute transactional flows. They are driven by a set of conventions and rules in a given context [16]. For its proper functioning, given the complexity of its transactions, it is essential to give access to the right information, at the right people, at the right time, to make a selective transmission of users, in order to fight against misinformation, over-abundance and deviant uses [12]. The principle of data management is based on the ability of actors to select information and analyze it, in such a way that it is only disseminated to its legitimate recipients. The interest of this approach is twofold. On the one hand, it allows a smooth organization of sharing actions, making the institutional processes efficient. On the other hand, it makes it possible to limit the risks linked to the poor dissemination of data, thus guaranteeing respect for confidential medical records.

The ethical processing of information seems to be the starting point of the MCHM's data management strategy. Béranger defines it as a mechanism for the interpretation of data, by a person or an organization, that will lead to give a specific meaning to data [12]. By giving attention to information, by analyzing it, the heads of MCHM tend to give meaning and value to data, as well as to determine the logistics of action to be applied: censorship, global dissemination, limited dissemination, etc. In the medical sector, it is fundamental to establish a reflection on personal health data through an ethical prism "in order to [remove] doubt and control uncertainties" [12] and to manage the risks inherent in the nature of patients' records. It leads to speak of the non-maleficence nature of the MCHM's information strategy: access to data is examined according to the profile and nature of the user [12]. Data sharing is conditioned by the profile of the information receiver, ranging from full sharing to very limited access, depending on activity and needs. This improves the security, confidentiality and protection of such data [12], as well as the performance of the information management system. By analyzing the data, determining the conditions for sharing and clearly identifying the receivers, the quality of access to patients' personal records is guaranteed.

B. Informational Lean Management: no Unnecessary Information

The data processing method leads us to analyze the notion of lean in quality management. Lean School is defined as "the search for process optimization by chasing down everything that is inappropriate or superfluous" guaranteeing "performance by eliminating waste" [2]. This method is usually applied to inventory management (0 stock), document management (0 paper), or logistics (0 unnecessary transport, 0 waiting, etc.). This can be relied to information management, in order to analyze the transaction rationalization activities [17].

Indeed, the info-ethical treatment as previously mentioned tends towards a very low entropy, i.e., a degree of almost nil disorder [12]. A system in which information is transmitted without analysis increases the level of confusion, as well as the slowness of decision-making and the risks of accidental dissemination of personal records. On the contrary, in a complex system such as the MCHM, the implementation of a hierarchy in information management (doctors analyze and choose the criteria before disseminating information) makes the actions of all team members easier and more fluid, by sending them only the data that will be useful to them in the exercise of their activity. This is a kind of lean management, applied to information management. This data dissemination method tends towards the goal of "0 useless information", in order to guarantee both respect for medical confidentiality (0 information poorly disseminated), the quality of patient care (0 information missing) and the fluidity of actions (0 dysfunction linked to poor information dissemination). This information management method seems to be perfectly adapted to the performance requirements of MCHM's missions, while benefiting the daily tasks (administrative and patient care).

V. ORGANIZATIONAL PROCESSES: GUARANTEEING THE QUALITY OF DATA MANAGEMENT

In this section, the organizational processes observed during the survey will be discussed, which refers to data and patients' records management.

A. *The Human Relations Theory as a Leading Light*

In the MCHM, the mobilization of the whole staff tends to improve the processes' efficiency [2]. The MCHM's management method is based on the involvement of all teams in improving the life of the institution: meetings, taking into account opinions, professional development, empowerment, etc. This method seems to be similar to the collaborative processes set up within the MCHM, although the institution does not claim any particular managerial method: unexpected discussions, weekly team meetings, festive group cohesion events, etc. This team management aims at analyzing defects and dysfunctions, and then seeking solutions [2]. This tends to improve the overall functioning of the establishment, where, according to Zacklad, all persons involved in the transaction are in the position of (co-)director, (co-)beneficiary, (co-)recipient (principal) and (co-)recipient [16]. Emphasis is placed on freedom of speech, professional responsibilities, skills of each individual and, above all, the necessary trust between employees, which is considered essential by all MCHM staff.

As Doucet points out, it is essential for the direction of quality action to be collegial. This makes it possible [in particular] to respect responsibilities and involve departments: medical consultation, scheduling, data management, human resources, etc. [2]. As a large number of individuals have access to the institution's health data, the use of this collaborative and collegial approach is essential to the MCHM. The increase in performance can only be achieved through the collaboration with the departments involved in this approach. By soliciting and valuing all staff members, the MCHM ensures fine relationship management, but also encourages professionalism and accountability of each individual. They also do so by regularly reminding them of the need for secrecy and rigor (formally and informally), especially concerning the performance of their daily tasks relating to patient health records. Transactional relationships lead to overcome formal/informal oppositions by insisting on their complementarity [5].

B. *Leadership: Team, Quality and Performance Management*

This managerial approach is in line with the objective of promoting confidentiality and trust with producers and suppliers of information, thus contributing to the control of risks and deviations of data [12]. However, for MCHM staff management to be effective, it must also deal with some leadership issues. Leadership and management of the institution must be provided by a person of influence who, thanks to his or her managerial skills is able to guarantee, effective cooperation and coordination, based on mutual trust [5]. The notions of cooperation and trust seem to be interdependent key resources for the management of complex systems. Cooperation relies on a clear commitment

of each member of the group and is strengthened by trust and by the working contract [17]. In a complex system, each member of the team contributes to the success of the institution goals, so it is important for all team members to be aware of the values their work involves, such as secrecy, efficiency, empathy, etc. [18] It is up to the leader to make the team understand these fundamental values defended by the institution, from which ethics rules of behavior flow. To do so, in the MCHM, many meetings are held, with the whole staff or with some subgroups (doctors-doctors, doctors-secretaries, etc.). Managing does not mean dominating. It is rather knowing how to talk to teams and how to get them to work towards a common goal [19]. Even if some members sometimes complain about the high number of meetings, they seem essential for the good management of the institution. Those meetings allow the team to have some feedback on the work and outline all technical or relational issues. It helps the manager to resolve the disagreements before they worsen and help the team to work with fluency [19].

The operational management of the MCHM is based on the involvement of the two doctors, whom will here be called P. and T. Their influence is based on their legitimacy within the team, gained through their seniority, their involvement in the project and their ability to organize the run of the institution. The team trusts in them. Trust is built over time and in the relationships. It is a capital that the two doctors accumulated through years [18]. They are well known by all the team members, sometimes for more than twenty years. They are also known for their emotional competencies [19], that combines feeling with objective cooperation skills. The long-term trust of the team gives P. et T. the ability to engage and influence each member of the group, which helps the team to solve complex issues [20] and aim for an outstanding performance of their work. P. and T. are complementary, both in terms of relational aspects and in the conduct of data establishment and management. However, for a good cohabitation, the roles must be clear and non-antagonistic [2]. The risk associated is the disappearance of authority representatives. The smooth running of the institution is based on the clear identification of authority figures, to which the staff can refer. The figure of authority also allows to the control of practices, beyond the "self-control" by the operator himself, in which skills and responsibilities are assumed by himself/herself [2], but not objectified by an external point of view. Each member is a part of the system and they have to work toward the same goal for the institution to reach its goals and insure the quality of care [19].

However, this verification dimension, in order to ensure the quality of the tasks performed, is quite crucial when it comes to such sensitive data as those referred to in this article: respect for medical confidentiality, quality of transmission of information, management of the risks of records leakage, etc. Taking leadership within the MCHM then seems to represent an additional element in the performance of strategies to protect patient medical records. The leaders act here as an element of internal data protection control, which compliance must be assessed and objectified

externally by a notational Data Protection Officer [2]. This perspective can also be considered by taking as a model the Zacklad cooperative transaction logic reading grid, framework for analyzing action and practice at the *meso* level [16].

VI. GENERAL LACK OF USE OF THE NATIONAL DIGITAL HEALTH RECORD

The MCHM tends to present organizational processes in accordance with public health requirements, while following effective procedures for the management of patients' personal records. It should, however, be noted that the national digital Electronic Health Record (in French, *Dossier Medical Partagé - DMP*) is not integrated into any of the care management approaches within this institution. The study case tends to reveal an attitude of rejection of this instrument by MCHM staff members. They themselves state that this folder "is not designed for medical practice", although they admit the promising nature of such a tool.

"In case of emergency, the DMP becomes counterproductive. Of course, all the information about the patient is included, but it is not sorted or classified. It is up to us to find the right information and, in emergency situations, we have something more important to do than sorting information" says E., one of the MCHM doctors. They also confess that they are disturbed by the additional and time-consuming actions required to update the patients' DMP, since this platform does not provide any automatic downloading add-ons for the software they use. It seems that the DMP system is in contradiction with the practices of MCHM professionals, with regard to their quality management processes. This notion is closely linked to the need for procedural rationality of the care action, namely an "orientation of the activity". In this orientation, the action is justified by taking into account the way in which the tools contribute to performance. It is partly defined by the quality of the realization process [17]. Doctors highlight a logic "inherent in our relationship with objects and our environment, which we judge according to their adaptation to our expectations and needs" [2]. Applying this to Doucet reasoning, it would seem that doctors judge the use of the DMP in terms of its field operability and its ability to meet the needs imposed by their profession.

However, according to their statements, data's quality processing on the DMP is incompatible with their needs. Charlotte Maday, in her article [17], uses the image of deep-sea fishing: throwing a net on the ocean floor, collecting information indiscriminately and presenting it to users. This image seems to be applicable to doctors' feeling towards the DMP. By presenting the "raw" data, the system is not in line with their requirements for efficient data management. It does not fit their ethical approaches or the "informational lean", the main data management strategies used within the MCHM. More broadly, DMP raises the need for co-production concerning innovation and the necessary collaboration between producers and users to guarantee the quality of a product or a service. Bringing together the documents and data, for process governance, requires mastering the notion of a system but, above all, acting in a

spirit of active collaboration [17]. The main issues related to the DMP concern its digital features, ethical uses of data and the ability of professionals from various trades to collaborate on the same project. It represents a question to investigate, specially concerning the conception and the interoperability of various medical software. The goal is to ensure the performance of software and improve the quality of care.

VII. MANAGING TEAMS AND DATA SECURITY IN TIMES OF CRISIS: AN HYPERTELIC CONTEXT

The MCHM was severely damaged by the COVID-19 crisis, placing its processes in a position that could be described as "hypertelic". This concept, developed by Simondon, originally applied to technical objects, particularly industrial objects [6]. It develops the idea that a tool specifically developed for a technology or for a specific context becomes obsolete and inadequate if the technology or context evolves. The hyper-specialization of tools or, in other words, a marked hyper-adaptation between a context and an object, can therefore lead to the "de-adaptation" if the environment evolves.

In the pre-COVID-19 context, the public health situation was relatively stable, which served as benchmarks for the development of the organizational processes of the MCHM: identification of very specific problems, seasonal epidemics management, stabilized external collaborations, rigor in data processing (technical and human), etc. The pandemic shattered these established paradigms as quickly as it did drastically. It put the institution's organizational processes to the test, particularly with regard to the protection of patients and data. There was an increasing risk of stress-induced errors, unintentional disclosure or a danger of a breakdown in organizational trust, which is a fundamental pillar of the organization of the MCHM. The pandemic highlighted the need for the institution to adapt to changes in its usual health context. It also highlighted its difficulty to do so. This difficult context contributed to the loss of adequacy of the organizational and operational processes of the MCHM. It led the organization to readapt itself profoundly and urgently, in less than a week. The crisis led to the emergence of what could be described as an organizational hypertelia, a "mismatch" of organizational processes with the context in which they are inserted.

This context was completed by the lack of reference points that could help cope this unprecedented situation. The goal for the MCHM was twofold. The first was to maintain the level of quality of care and the second was to protect the identity of infected patients. In a climate of anxiety and marked suspicion, it was important for the organization to guarantee the safety of its patients and its staff. Tracking infected patients without disclosing confidential information does not only required organizational adjustments but also a significant amount of data management work. The bulk of the work was not so much based on the technical aspects of data storage as on the human and operational aspects. Human and operational issues were identified by the doctors as the two main objects mobilized to deal with the crisis.

VIII. COVID-19: THE NECESSARY EVOLUTION OF ORGANIZATIONAL MANAGEMENT

Within the MCHM, the crisis situation would have led to a certain degree of organizational fragmentation, resulting in a lack of team cohesion, a loss of coherence in decision-making, and difficulties in establishing an action plan or prioritizing. There was also a high risk of a loss of organizational confidence and a backlash that could have put the organization in a position of failure. It seemed relevant, in this context, to appeal to the four organizational issues in times of crisis, defined by Le Cardinal [18]: risk, uncertainty, complexity and sense of values. The risks, especially before the peak of the epidemic, were multiple, whether individual, organizational or health-related. This leads to the notion of uncertainty. During the survey, MCHM practitioners said that none of them, including the most experienced, had ever, in their professional or personal life, faced such an emergency situation: "No matter how much I think about it, I can't find anything comparable to what is happening to us now. How should we deal with a pandemic whose magnitude and consequences stay unclear?". The situation was particularly complex for the organization, as it required a hasty and profound redesign of its operations, while at the same time ensuring data and patient protection. From an operational point of view, while the substance of the work remained the same, the health necessity induced a change of working habits to which the staff had to adapt quickly. From a procedural point of view, the disinfection measures proved difficult to reconcile with the necessary pace of consultations. From a relational point of view, the staff had to manage a multitude of strong emotions to ensure the smooth running of the MCHM, which could have had quite detrimental effects on the cohesion of the group and the quality of service. Cohesion is an indispensable element for the solidity and the security of an organization. This brings us to the last point made by Le Cardinal, namely the sense of values [18]. While the first three points have sometimes been thorny or grueling for the MCHM staff, this notion of value has proven to be rich and redeeming, helping to strengthen the staff's confidence in the organization.

A. Trust as an organizational key resource

One of the main challenges was to protect confidential data from accidental or deliberate misuses (e.g., find out who is infected to protect oneself and one's families). The team needed to emphasize strong group cohesion and deep trust to limit the perverse effects of fear and uncertainty. Many authors recognize the fundamental nature of trust in the consolidation of professional cooperation relationships [18] [22] [23]. They also insist on the importance of trust for good health of the organization. This notion is all the more important in times of crisis or in risky situations. It contributes to the fluidity of actions, exchanges and collaboration, by minimizing the costs induced by action control procedures [24]. Indeed, within organizations that doubt their own competences, control activities reduce the quality of procedures and decision-making. They also

increase process times, not to mention the consequences in relational and psychosocial terms. Trust is all the more important as it plays a central role in times of crisis and in risk exposure, as it partly conditions their management [25] and their consequences.

One of the pillars of the successful crisis management was the revaluation of the values defended by the MCHM: dedication, protocol rigor and competence. The young doctors took over the reorganization and the whole COVID-19 medical consultations. This *esprit de corps* strongly contributed to the reinforcement of positive values within the team (solidarity, team spirit, devotion, commitment, etc.). Moreover, the young doctors not only established the new care protocol, but also expose themselves to the virus, by taking in charge the COVID-19 consultations. In doing so, they diminished the exposure of at-risk doctors to the COVID-19 (age, comorbidity factors, etc.). They took some risk to protect their colleagues. Within the new protocol, the main space of the MCHM was isolated from the space dedicated to COVID-19. The doctor's goal was not only to limit staff exposure to the virus, but also to maintain patient anonymity. The aim was to protect the personal records of potential infected patients and to subtly inform the rest of the staff of the limits not to be crossed.

The dedication of doctors to the organization of care and the protection of staff and patients was a decisive factor. It has a strong impact on the consolidation of trust during the riskiest moments of the crisis, according to the survey results. A hundred percent of the respondents agree that this was the event that marked them the most, that gave them enough confidence to stay united and that gave them a frame to follow for the rest of the crisis. This feeling has to do with the relationship between individual focus and collective focus, between profit and risk. By taking the risk of exposing themselves to protect their colleagues, the young doctors valued the notion of dedication and the confidence they had in their team's ability to deal with the crisis. Moreover, their attitude towards the protection of their infected patients' data was a reminder of the ethical conduct they expected from all the staff.

B. Emotional intelligence: a pillar of crisis management

The doctors expressed an *esprit de corps*, a withdrawal from individual benefit for the benefit of the collective, of the whole organization. This strong decision helped to strengthen the commitment to the collective and clearly defined their role within the organization [2]. At this worrying and uncertain moment of the crisis, their involvement represented an organizational anchor point, a reference point for all staff, enabling them to become aware of the values at work in their work [19; 20]. From a meso point of view, this leads to a pronounced form of professional and emotional commitment of all staff. The doctors' action was both a translation and a reminder: it reflected the ethical conduct expected during the crisis, while reminding staff that they could trust the rigor of the organization. This attitude echoes to a communication studies approach, which considers emotions as a social performativity [26]. According to this approach, emotions and

affectivity are not considered as individual construction, but as a product of social interactions, forget by the socio-cultural culture of the organization [26]. As the organization benefited from a long-term and strong affective and emotional bonding, it seemed evident to capitalize on it to manage the first days of the crisis.

The stakes of this event were both rational and emotional. As Goleman reminds us, "emotional intelligence is based on self-control, ardor, perseverance and the ability to incite oneself to action" [19] [20]. It is based on fundamental ethical attitudes. The rational mind, of which we are most aware, is balanced and reflective, while the emotional mind is impulsive, powerful and sometimes illogical. The attitude of doctors has appealed to this dimension of the mind, acting against the deleterious effects of agitation, persuading - not convincing - the rest of the team to act to achieve a common goal. They acted on feelings rather than on reasoning, on the capacity for commitment and influence.

Rational and emotional intelligence are inseparable from each other for the well-being of organizations. Alvarez, in 2001, highlighted the constant need to combine the rules and procedures of formal systems with the emotional dimensions of the team. These are plural and circular relationships [27]. Within the MCHM, every action taken, every protocol established acts on the psychosocial determinants of the team. The use of masks and gloves, but above all of hats and gowns, which were not mandatory, had the effect of reflecting the organization's desire to protect its employees. The same is true of the protocols for receiving COVID-19 patients, as well as the systematic disinfection processes, which were intended to enhance staff protection. By acting on the operational and procedural level, the MCHM was also able to act on the affective dimensions of its team and enhance its interest in them.

The collective action can be related to the ability of the organization to be resilient, e.g., to "absorb, respond to and also benefit from events that occur as a result of changes in the environment" [28]. The hypertelic context can lead the organization to a definitive failure. It was all the more crucial to reduce its effects during the crisis as such a failure could endanger the whole territorial healthcare network and the population. Resilience rests on a system of shared values and an ability to use owned resources in a creative and innovative way [29]. The MCHM was able to draw on its strengths, particularly its human and procedural strengths, and on its value system to stem the adverse effects of the crisis. As the organization could not benefit from any additional technical and human support, it intelligently reviewed its entire procedures, in order to make the best use of the resources at its disposal and to adapt as best as possible to the management of the crisis.

C. *The essential circularity between technical and human aspects*

An organization is not only based on these non-human and technical aspects, but on an alliance of these dispositions with the social and human space of which it is composed. Yet one of the staff members showed a contagious anxiety, despite this collective effort to face the

situation calmly. It resulted in growing restlessness, errors in the management of patient data, difficulty communicating with others, and proven inefficiency in performing their tasks. Thus, both procedurally and humanly, the employee undermined the organizational stability and security of the MCHM. This was all the more worrisome since the psychosocial stability of the MCHM remained precarious, suspended from daily government announcements on the evolution of the epidemic. The decompensation of the employee risked causing internal dysfunction, the repercussions of which could be disastrous externally. Indeed, each individual is part of the system and each exerts an influence on all the others [19] [20]. The decision to allow this employee to work from home allowed the preservation of other staff members and the quality of service to patients. This example clearly shows that a system or network does not have an immutable durability, but on the contrary must be vigilant to each of its components to ensure their cohesion.

Everything is thus equally important in the organization: organizational factors (procedural capacity), cognitive factors (interpretation by individuals), discursive factors (information exchanges), as well as non-human entities. This whole constitutes the organizational collective, the network. The stability of the network depends on the solidity of the components and their ability to anticipate and cope with future events. It is this anticipation of events that has been the lifeblood of the MCHM. By isolating the disruptive actor before it impacted the rest of the organizational components, they made it possible to safeguard the stability of the network and data security, while offering a benevolent and adapted solution. It is difficult for an organization to find a constant balance, especially when it comes to human components in a crisis situation. The strength and quality of a network is based on its ability to adapt to its social context (Callon, Latour, Akrich, etc.). The social dimension is understood as an effect caused by interactions between very different actors, who are continuously succeeding each other and who participate in the evolution and modification of the network. Within the MCHM, there were successive, progressive and necessary adaptations of the organizational processes, which reinforced its capacity for collective action and fought against its hypertelic dimension.

IX. ORGANIZATIONAL HEALTHCARE NETWORK: A MODEL OF COLLABORATION AND INTERDISCIPLINARY COOPERATION

The organizational "readjustment" solution chosen by the MCHM was interdisciplinary cooperation. The beginning of the pandemic was, according to the doctors interviewed, the most complex moment in their crisis management. Starting from scratch is one thing, making this new beginning efficient is another. According to Pesqueux, complexity, uncertainty of outcome and the dangers involved call for cooperation [24]. As soon as the state of emergency was made official, the objective was to collectively find the most satisfactory solution to ensure continuity of care, while avoiding antagonisms, paradoxes and contradictions. This explains the rejection of the action

plan proposed by the leaders and the health framework. This, according to one of the young doctors, "was, in itself, not a bad idea. The substance seemed good to me, but there were too many contradictory elements in the procedures. There were also a lot of redundant steps, which wasted unnecessary time and were not relevant to the management of COVID-19 patients. We absolutely had to involve the surrounding health care system. Not only to refine our strategy, but also to ensure consistency. This excerpt illustrates a crucial point in crisis management. In a situation like this, it's not so much a matter of having experts on specific topics. Rather, it is a matter of consolidating a network of actors capable of collaborating and producing collective responses to problematic situations, while remaining united and solid to ensure an efficient and constructive organization [24].

In general, the organizational healthcare network constitutes a tool for improving professional practices and, more broadly, it contributes to maintaining or even improving the level of quality of service provided [10]. The network must act on three levels of collaboration, all of which are essential [5]: the operational (or clinical) level - where the acts of care are carried out -, the structural level - which mobilizes human and material resources to ensure continuous and comprehensive care - and the institutional level - representing the decision-makers and financiers of the health system.

With regard to the operational level, the MCHM relied on the interdisciplinary nature of the organizational health network, in particular the hospital institutions. The latter benefit from numerous plans and protocols specific to crisis management, which propose efficient and specific organizational processes to respond to the multiplicity of types of crisis. Thanks to the solidity of their professional network, MCHM doctors were able to quickly obtain the information needed to structure their care protocol. The latter represents a procedural hybridization. On the one hand, it is based on the principle of sectorization in the hospital environment, which was gradually implemented in all institutions. However, since hospitals were better adapted to procedures for isolating contagious patients, the MCHM team had to adapt the procedure to its own structural constraints. This required a collaborative reflection in order to find a solution that would be comfortable for patients, while limiting the risk of exposure for professionals.

The operational cooperation of the MCHM local health network also developed a structural cooperation. As hospitals feared to be overwhelmed by the number of patients, MCHM doctors volunteered to replace hospital doctors during their days off to maintain the quality of care of the surrounding hospitals. Their objective was to maintain the quality of patient care, so that it would be comprehensive and continuous [30]. There seems to be, within this organizational health network, a certain conception of solidarity, which associates cooperation to the realization of a common work [24]. This case is in line with the organizational model known as "collaboration - cooperation" and corresponds to a plural level of relationship, which enriches and fleshes out the

interdisciplinary relationships between institutions. This organizational principle tends to reject practices of non-cooperation and domination and instead aims to promote relational exchanges. This inter-organizational alliance was, it seems, a determining factor within the Landes health territory.

X. CONCLUSION

During the first phase of the survey, the sharing procedures introduced at the MCHM raised questions about risk assessment. In this institution, different informational and managerial strategies were put in place to secure the exchange of personal records. However, during the first investigation, it seemed that the process of quality of care evaluation and "information crisis" management protocols (accidental or fraudulent disclosure, for example) were relatively minor. Before the COVID-19 crisis, the institution did not seem to have been confronted with any type of major crisis. Its youth and its efficient management could explain this situation. Emergency protocols to resolve this type of situation were non-existent in the MCHM. It is problematical, as this implementation is one the most important principles of evaluating the quality of care in France, since the publication of the law of 31 July 1991 [13].

It, therefore, seemed essential to study in great depth the involvement of the MCHM during the crisis and the change it had to conduct to brave it. The COVID-19 had been the real first challenge that could have put the MCHM in danger or even in total failure, especially concerning personal records management. During first month of the pandemic, the MCHM invested in a global reflexive stance to modernize its processes [30]. It questions its own modes of management to adapt to the crisis and so its capacity of resilience, as an ability of the organization to act in adequation to the reality, without taking any unthinking risk [29]. In the field of health, apparently minor errors or failures can have vital consequences [1] or endanger a health care institution and its staff. The management of the quality approach of such an institution cannot be done without a risk management component, nor a more global and formalized evaluation aspect. The measurement principles are inseparable from the principle of quality management [10]. It was necessary for the MCHM to proceed to this modernization and to develop its quality management procedures.

The second part of the survey highlighted the importance of organizational trust and the mobilization of emotional intelligence. Quality and data management rely to some rational perspectives. However, the others aspects of the institution depend on human and emotional aspects, even considering data management. The price for the lack of emotional intelligence or trust could end up compromising the existence of the organization [19] and its efficiency during the crisis. Before the COVID-19 pandemic, problems were resolved with discretion and fluency, with clear and identified leaders. The case of the MCHM presents a very interesting duality. Indeed, despite the profound redesign of these organizational processes, its founding values

(commitment, solidarity and trust) had been critical for its success [19] and had insured the stability and the fluency of the MCHM team. The survey could thus conclude to the predominance of trust and emotional intelligence over processes and management of technical devices. It also highlighted the necessity for healthcare institutions to be resilient and to develop a continuous adaption to its environment, to avoid hypertelia, and to learn from its crisis experiences to improve its processes [31].

It would be interesting to investigate, on a larger scale, other MCHs, in order to compare the results of this study with other territorial and technical contexts. Health care institutions were severely tested by the epidemic of the COVID-19 and some of them did not experience the success of the MCHM. Conducting a large-scale survey would test the hypothesis of the preponderance of emotional intelligence in crisis management. It could also help identify the key resources on which organizations should rely during crisis contexts. In a longer-term perspective, the results of such a study could formulating crisis management approaches dedicated to emerging and collaborative health organizations. The objective is also to consider the development of a single working model for all MCHs, specially concerning data privacy management. As each MCH has its own specifications (socioeconomical context, number of the staff members, equipment, competences, etc.) would it be possible and relevant to propose a single crisis management model and resilience capacity to all of them [32]?

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