26th EISIC
University of the West of Scotland

ISBN 9791221039054

Deciding in turmoil: Four University Hospital Centres in the Covid-19

Sandra Bertezene, CNAM, Paris, France
sandra.bertezene@lecnam.net

David Vallat, IEP Lyon, France
david.vallat@sciencespo-lyon.fr

Philippe Michel, CHU Lyon, France
philippe.michel@chu-lyon.fr

Jacques Martin, ESOE
jma.martin@wanadoo.fr

Abstract: Health establishments in France and everywhere else in the world have had to face unprecedented problems during the Covid-19 sanitary crisis. Nevertheless, they managed to cope in a reasonable manner. The question is how could they do it. As bureaucratic organizations working according to pre-established rules and procedures within a hierarchical structure, they are no equipped to tackle sudden serious unexpected problems. This study tries to answer this question. It was led in 4 University Hospital Centres in the French region of Auvergne Rhône-Alpes covering the period from the beginning of the pandemic in January 2020 to the second big wave of contaminations in the Autumn of 2020 divided into 3 Phases (January mid-March 2020, mid-March to mid-May and after mid-May). The theoretical framework for the research was to use the concept of the High Reliability Organization developed by the 'Berkeley School' (1987) and test if hospitals were able to tackle the pandemic by forgetting about their bureaucratic nature and adopting some of the ways of operating of HROs. The findings, through a qualitative methodology, largely prove that the hypothesis was valid. The lessons that can be drawn from this research and that can inspire the authorities managing the health sector are that a new type of organization, known as the flexible bureaucracy (Bigley and Roberts, 2001), could be developed in health establishments to make them ready to face extra-ordinary events such as a pandemic or other catastrophic similar events.

Type of paper: research paper based on case studies.

Key words: Covid-19 sanitary crisis, hospital management, bureaucracies, high reliability organizations.

Introduction:

When the Covid pandemic started at the beginning of 2020, French public hospitals were already facing strong economic and social tensions. To deal with this situation, the then French Prime Minister and Minister of Health announced in November 2019 an "emergency plan". In spite of these tensions, health professionals immediately mobilized themselves to tackle the sanitary crisis caused by the new coronavirus. During the year 2020, hospitals cared for an excess of 1.3 million persons compared to the previous year (ATIH, 2019; Drees, 2022).
How could hospitals resist this brutal pandemic that had never been before in spite of their situation of weakness? The hypothesis formulated to answer this question is that they absorbed the shock like a High Reliability Organization (HRO), not because they were one, but because the context led them to adopt an organizational decision-making process akin to that of HROs.
In order to cope better with crises, the theory of High Reliability Organization appeared in the 1980s and 90s thanks to the works of the Berkeley school led by Rochlin, LaPorte and Roberts (1987). The 'high reliability' is a paradox, a kind of 'continuous abnormal performance' that can be observed in organizations with a high level of risk (Roberts, 1990). Reliability characterizes what is safe and trustworthy. It is observed through the absence of errors or catastrophes which is difficult to measure with classic indicators. That is why it is defined as a dynamic and recurrent non-event (Weik, 1987). This "abnormal performance" can be observed in organizations that couple productivity and reliability (Roberts, 1990), thus becoming able to identify the most minute disturbances and to react immediately before they cause a catastrophe.
In spite of its spreading in the health sector in the USA for more than 30 years (Veazie et al., 2019), the theory of HROs remains little studied in the French health sector. It is then to nourish thinking on the operationalization of the HRO theory in French health organizations that we have led an exploratory research, as part of the Covid Pandemic Institutional Management programme, with a double objective: on the academic plane to resort to the organizational decision-making process of HROs (Roberts, Stout, Halpen, 1994) to apply it to French hospitals during the first year of the Covid pandemic, and on the management plane to understand the organizational decision-making process during the first year of the pandemic and check to what extent it is akin to that of HROs.
Part 1 is devoted to the theoretical framework of the research. Part 2 presents the results of the exploratory research carried out in 4 University Hospital Centres of the Auvergne Rhône-Alpes Region, grouping 52,000 personnel. Part 3 is an analysis and discussion of the results.

Part 1. The theoretical framework: HROs and the decision-making process

1.1 The HRO theory and its contribution for health organizations

Charles Perrow, a member of the enquiry commission following the *Three Mile Island* accident in 1979, conducted a research which led to the concept of 'normal accidents'. 'Normal accidents' are inevitable in high-tech and complex systems (e.g. nuclear power stations, aeroplanes). These systems comprise a huge number of components that interact, creating a big number of potential failures. 'Normal accidents' occur when several of these failures are combined and cause an accident, which are called 'normal' because organizations are not able to grasp the complexity of the interactions and the tight coupling of the technologies used. A failure quickly spread through the system causing a domino effect. The consequence is that these accidents are very difficult to identify. They are an inherent component of the system. Because they are inevitable, they are 'normal'.
The researchers of the Berkeley school are opposed to Perrow's conclusions. They note that certain 'risky' organizations know few, sometimes no accidents (Rochlin, LaPorte, Roberts,

1987), such as nuclear aircraft carriers or the flights control system. Hence, their studies led them to fashion the concept of High Reliability Organization characterized by a strong capability of adaptation to change and organizational flexibility (Volberda, 1996). Along this path, Weik and Sutcliff (2001) specify the five major characteristics of HROs.

- Quick identification and treatment of errors (*preoccupation with failures*)
- Rejection of simplistic explanations of errors and consideration of the diachronic linkage of problems and the systemic dimension (*reluctance to simplify interpretations*)
- Frequent and continuous control of operations, respect of procedures, focus on any unexpected change (*sensitivity to operations*)
- Commitment to resilience through the detection and treatment of errors so that they do not paralyse the organization, refusal of 'normal accidents' (*commitment to resilience*)
- Initiative left to experts to solve the problem in a situation of crisis, whatever the hierarchical level (*deference to expertise*).

The development of the HRO theory in industry in the 1980s led to the need to understand this theory better in the health sector. However, the question for decision-makers is where to put the cursor of reliability? Hardly any incident/accident, or acceptance of a certain level of dysfunctions. It is obviously impossible to have exactly the same approach in industry and health (and all 'social' activities) due to the importance of psychological factors.
Following a study in an intensive care unit for children in California, Roberts and Bea (2001) identified two major strategic choices: the recruitment of trained personnel whose competences are directly applicable to the patients they have to care for and the decentralization of the decision-making.

The HRO theory, however, presents a number of limitations.

1.2 The limitations of the HRO theory in health organizations

The first limitation results from the complexity of the health sector. The HRO theory presupposes a systemic approach of the organization (Leveson et al., 2009) which is not easy in the case of hospitals which comprise a big number of quite different components (health units, administrative units, procurement, maintenance) with a very big number of interrelations and with other systems (e.g. Health Regional Agencies, Ministry of Health, Social Security system, Medical Schools, etc.) (Waller, Roberts, 20033). Therefore the high reliability of hospitals depends on the high reliability of all the other systems with which they have strong interactions (LaPorte, Consolini, 1991). Even if hospitals are submitted to strong requirements in terms of quality and risk management, there are always serious undesirable events that negatively impact the stay of patients and which are evitable for most of them. It is then not yet possible to define and anticipate all the failures (Blatt et al., 2006), which raises the issue of the organizational, regulatory, social and cultural factors permitting the development and perennity of HRO characteristics in hospitals. The very size of the system makes the high reliability rather utopian and then high reliability should be focused on a particular sector or service for greater effectiveness albeit with a limited scope.
The second limitation is the limited attention paid by the literature on HROs to social relationships, which can hinder the high reliability (Bourrier, 2001).
The third limitation is the possible incompatibility between the objectives of the high reliability and those of the economic performance (Journé, 2009; Martelli et al., 2018).

The next section presents the organizational decision-making process in HROs.

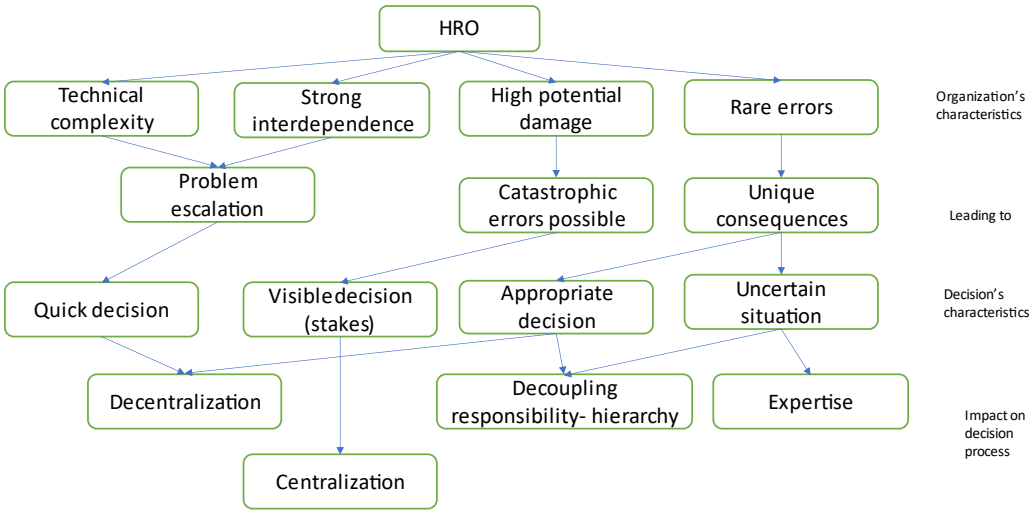
1.3 The organizational decision-making process in HROs: the Roberts, Stout and Halpen (1994) model

In a study entitled *Decision dynamics in two High Reliability military organizations* Roberts, Stout and Halpen studied the decision-making process in two nuclear aircraft carriers. At the time of the study, only one accident, a fire on the deck, had occurred since 1969. Following this study the authors propose a model (Figure 1) of the organizational decision-making process. Organizations present four fundamental characteristics:

- Line 1 Characteristics of the organization: complex technologies, interdependent technologies, high potential damages, few errors
- Line 2 Leading to: escalation of problems, possible catastrophic errors, unique consequences
- Line 3 Characteristics of the decision: quick, visible, appropriate in an uncertain situation
- Line 4 Impact of the decision-making process: decentralization, decoupling of responsibility and hierarchical level, expertise

This model is at the core of our research hypothesis: hospitals absorbed the shock of the Covid pandemic like a High Reliability Organization, although they are not one and do not pretend to be, but because the context pushed them to adopt such a decision-making process.

Figure 1. The decision-making process in HROs (Roberts, Stout, Halpen, 1994)



Part 2. The organizational decision-making process in 4 University Hospital Centres at the time of the emergence of the Covid-19 pandemic

The following sections present the method of collection and analysis of the data (2.1), the results of the evolution of the decision-making process in three phases: at the beginning of the first 'wave' of the new coronavirus (2.2), at the end of this first 'wave' (2.3) and from the return to normalcy and the second 'wave' (2.4).

2.1 The method of collection and analysis of the data

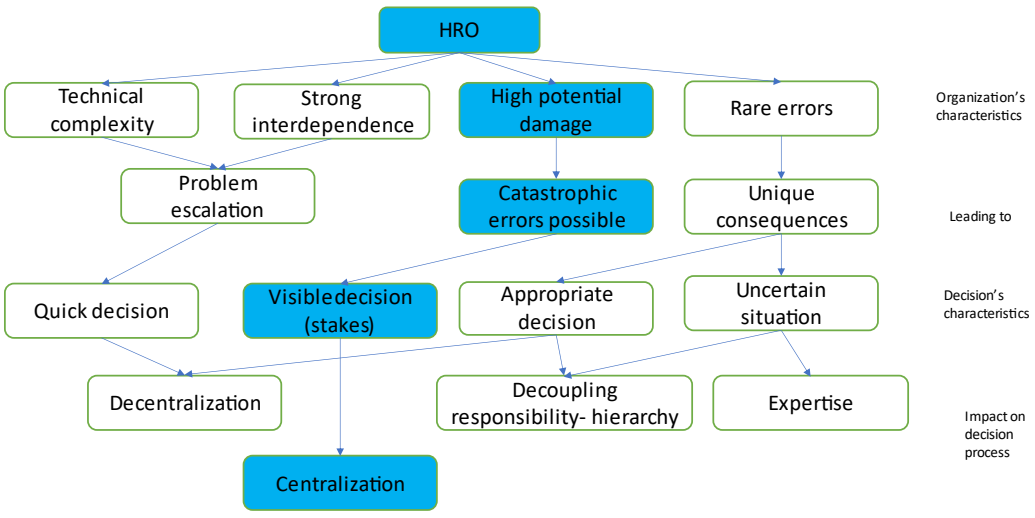
We have opted for a study of multiple cases according to an exploratory approach (Eisenhardt, 1989; Yin, 2017).
We distinguish between three phases. The first two have been observed during the first 'wave' of the pandemic; first between January and mid-March 2020 and then between mid-March and 10 May 2020. The third phase began on 11 May 2020 with the end of the confinement. If this last phase began in a subdued way with the progressive return to the normal working of establishments, it jumped to the forefront with arrival of the second 'wave' of contaminations in the Autumn 2020 in the Auvergne Rhône-Alpes Region.
Between September 2020 and February 2021, 115 persons were interviewed (individual and semi-directive interviews): 34 persons from the top management, 59 managers and 22 persons without a hierarchical responsibility. The persons were selected so as to cover all the services concerned by the pandemic, including support services such as logistics or IT.
The interviews were recorded with the Teams software in their entirety and coded with Nvivo. All the interviews bore on the functioning of the establishment during the crisis, the solutions and levers found, the innovations implemented, the difficulties encountered, the failures and the obstacles lifted. The relevant passages were identified and isolated to be grouped by themes in order carry out a thematic analysis. The coding was done *a priori* on the basis of the themes of the decision-making of Roberts et al. (1994), and completed as we went along with three other themes related to the three phases in the global process: Phase 1 (January mid-March 2020) with a cosmological event, Phase 2 (mid-March 10 May 2020) with an *ad hoc* flexibility, Phase 3 (after 11 May) with the return to the *status quo ante*.
The following sections present the results of the interviews of the top managers, managers and personnel with a hierarchical responsibility in the four hospitals.

2.2 Phase 1 – The emergence of the pandemic: a "cosmological event" (Weick, 1993)

At the beginning of the pandemic in February-March 2020, the potential damages are quickly identified: lack of beds in reanimation services, a quasi-total absence of knowledge about this new virus and the lost opportunities due to the self-censorship of people not daring to consult a physician or go to the hospital for fear of the virus or diverting professionals from focusing on the virus.
In this context, the persons interviewed point to various difficulties that can have catastrophic consequences. The first one is the de-programming of tests or operations which would have fatal consequences for some. The second one is the lack of human and material resources which can lead to a limitation of therapeutic acts. The third one is the lack of knowledge about the virus with the risk of administering inappropriate care. The fourth one is the risk of spreading the virus inside the establishment itself.
This unseen situation triggers new decisions at the national and regional levels and in hospitals as the referentials of the actors have exploded. At the national level the decision of prompting people to contact the Medical Emergency Service in case of doubt about a possible contamination triggers the extension of 'regulation rooms' in hospitals. From 13 March, hospitals, as well as the majority of companies, are required by the Government to resort to distance work for all the personnel whose presence is not necessary by the patients. Virology services are declared priority so that they do not suffer from the shortage of equipment. The Government also forbids visits in Care Homes for the Elderly and log term care units (11 March 2020. At the regional level, the Health Agencies organize the transfer of non-Covid patients to other establishments to liberate beds in reanimation for Covid patients. At the local level hospitals have to make decisions visible for their overseeing authorities by the creation of 'crisis

cells', an increase in the medical staff/patients ratio, changes in working hours and the creation of care units entirely devoted to Covid patients.
This reorganization induces the suppression of certain work processes become useless with the de-programming of a number of acts. At the same time new rules have to be put in place to mitigate as much as possible the risk of contamination inside the establishments.
The management has to convince all the parties of the validity of the decisions notably by organizing and encouraging a bottom-up communication.
At this stage, decisions are mainly centralized at the level of the Government, the Regional Health Agencies and inside the hospitals with a vertical process nevertheless fed by a bi-directional communication permitting the adjustment of decisions and their acceptance.
In spite of these decisions which permitted organize work for a few weeks, their consequences remained totally fuzzy for lack of knowledge about the virus, contaminations, possible medication and vaccines.

Figure 2 – Phase 1: The shock of the emergence of the virus, a cosmological event



From mid-March 2020, establishments have to face uncertainty, which induces a a radical change in the decision-making process.

2.3 Phase 2 – The adaptation to the first wave of the virus: *ad hoc* flexibility

At the end of the 1st 'wave' the same problems can cause the same catastrophic consequences as at the beginning. However, other elements evolve. A number of decisions are made to improve or strengthen the functioning of the hospitals:

- Multiplications of strategic and operational communication tools to allow the transmission of the information related to the patients (e.g. WhatsApp groups until forbidden for confidentiality reasons),
- Development of internal training sessions. Quasi daily meetings and webminars are created and organized by physicians to spread the knowledge about the virus,
- On an ethical place, the hospitals decide the allow visits by the patients against the national decision,

- Procedures related to purchases and logistics. The purchasing process as such is abandoned, which permits to acquire equipment and products suffering from shortages quickly (e.g. the hydro-alcoholic gel is produced internally.

The increase in responsibilities takes place in all the establishments. Even if organigrams are not modified, the responsibilities taken on by the different actors are strengthened. It is also noted that responsibilities 'migrate' from one person to another or from one service to another. *De facto* a strong pressure is exerted on professionals, whatever the sectors or the hierarchical level, for example:

- Crisis cells rely on the professionals *in situ,* without any hierarchical responsibility, to identify dysfunctions and new facts and make them move up the hierarchical line,
- Great attention is paid to the work of virologists,
- Health care staff are on the front line and work more to ensure treatments in spite of the risks for their own health,
- People in charge of telemedicine know a spectacular increase in workload and increased responsibility,
- Administrative staff sometimes take part in the regulation,
- Medical and pharmaceutical students as well as nursing students take on more responsibilities,
- Outside people come to strengthen medical teams also have the responsibility not to make mistakes whereas their knowledge of the service is limited and patient are in a critical state.

For some, the volatility of the environment gives them a sense of disorganization with a rapid spreading of a lot of information which are sometimes contradictory. For others, the increase in responsibilities is a relief, sometimes giving great satisfaction. Physicians and health staff can make decisions themselves independently from administrative services.

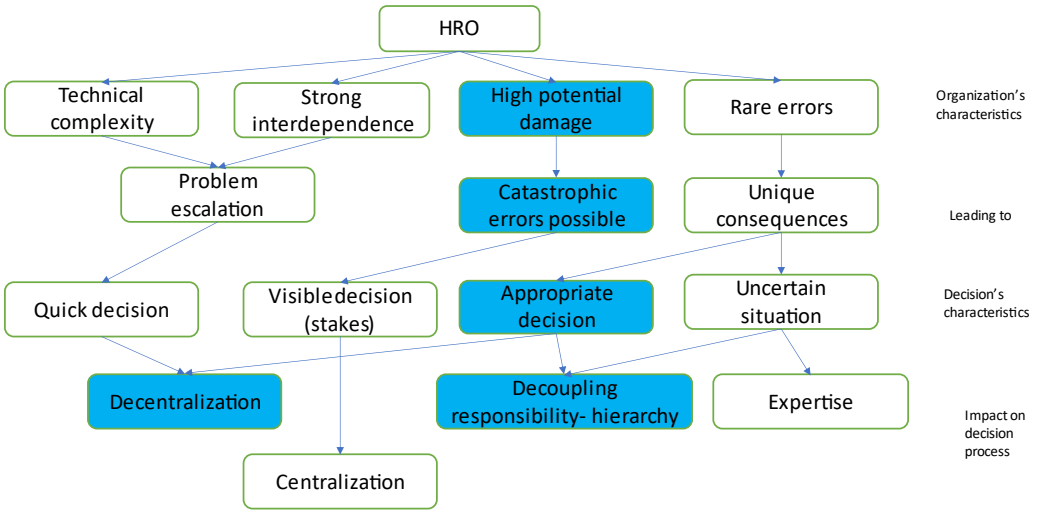
Decentralisation takes place between the Regional Health Agency and the hospitals and inside the hospitals themselves. Decentralisation flows down hierarchical levels to staff without a hierarchical responsibility.

The top management gives general instructions for the reception of patients, and then the management is decentralized towards the physicians responsible for a service. They can decide alone, with their teams, about the organization of work and treatments. The decision-making process is quicker. The health sphere has the feeling of being above the administrative sphere. The decentralization gives it a power and autonomy never observed before.

This decentralization is globally welcome by the staff as it allows them to act flexibly and swiftly, even if some may have a feeling of abandonment or confusion during that period. Autonomy, freedom and trust are positive impressions in their discourse.

This is illustrated in the next Figure.

Figure 3 – Phase 2: Adaptation to the 1st wave of the virus, *ad hoc* flexibility (mid-March-10 May 2020

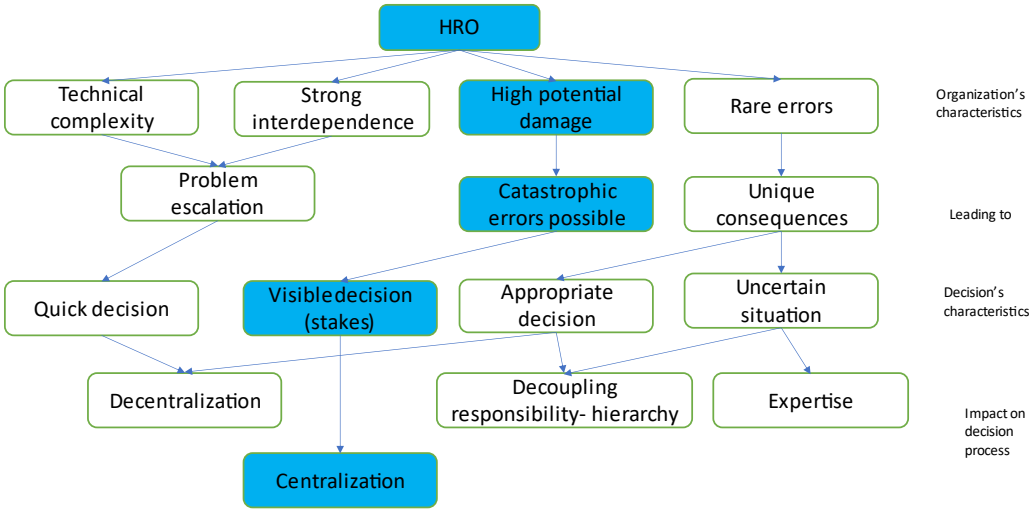


On 11 May 2020, the period of confirnement is over and hospitals organize their return the normal situation progressively.

2.4 Phase 3 – The return to normalcy with the ebb of the 1st wave of the virus: the *status quo ante*

The return to normalcy is organized from the 11th of May and during the Summer. As soon as the 2nd 'wave' appears, problems are the same as at the beginning of the pandemic but are more critical because the Auvergne Rhône-Alpes Region is affected very early compared with other French regions so that there is no respite for hospitals. Catching up with delays and the non-deprogramming of operations wanted at the beginning of this wave creates very strong tensions in matters of human resources. Teams suffer from fatigue, stress and loss of motivation.
This 2nd wave surprises the actors whereas the 1st wave should have prepared them to this situation. 'White Plans' remain unchanged and are not adapted to the situation. Physicians are worried and fear that the state of patients will worsen as deprogramming become inevitable again due to the arrival of increasing numbers of Covid patients.
However, contrary to the 1st wave, equipment problems are no longer a major risk.
Fatigue is felt everywhere leading to the challenging of 'White Plans' and information systems that have not evolved, by the personnel.
Some work methods are modified to face the new situation, drawing some lessons from the 1st wave. The reception and therapeutic procedures of patients are formalized, working hours are modified with the creation of shifts to relieve the personnel, cooperation with private establishments is strengthened, Covid patients are separated from other patients. Above all, there is a return to centralization at all levels.
Although this centralization is favourable for a number of decisions, a number of them are not effectively spread throughout the establishments and not understood and accepted by health professionals.
The following Figure illustrates this third and last phase of the process.

Figure 4 – Phase 3: the return to normalcy and the fatigue in front of a situation that drags on, the *status quo ante* (from 11 May 2020)



In the 3rd Part, the different results partially validating the research hypothesis are synthetized, analysed and discussed: to tackle the sudden arrival of the pandemic in 2020, hospitals have managed to resist as the context led them to adopt an organizational decision-making process akin to HROs.

Part 3. Synthesis, analysis and discussion of results: an effective decision-making process akin to that of HROs

The results show how the organizational decision-making processes in HROs can be applied, with variations, inside health establishments which are fundamentally big bureaucracies.

3.1 Synthesis of the results

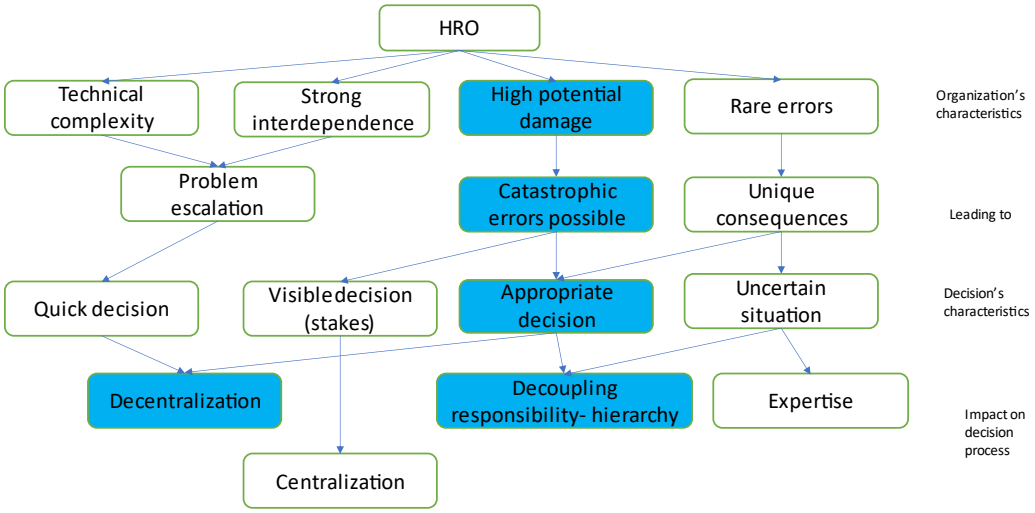
The results permit to underline two points. First, the decision-making processes are identical in the four hospitals, which is understandable as they are identical organizations and experienced the same sanitary crisis. Second, only one characteristic of the HRO emerges from the interviews, that of the occurrence of serious potential damages. The other themes related to HROs (technical complexity, strong interdependence, rare errors) are not mentioned by the interviewees. This absence can be explained by making two hypotheses:

- Hypothesis 1: the deprogramming of treatments permitted for the establishments to reduce the interactions between complex technologies. Interactions were limited to services involved in intensive care,
- Hypothesis 2: the catastrophic errors are due to the serious potential damages caused by the pandemic. The source of errors is here not endogenous but exogenous.

Figure 5 permits to answer the research question expressed in the introduction and to validate, at least partially, the hypothesis that hospitals managed to resist the brutal and intense sanitary crisis, at a time when they looked largely weakened, because they absorbed the shock like an

HRO, although they were not one, but due to the context which led them to adopt an organizational process akin to that of an HRO.

Figure 5 -Synthesis of results: the context led hospitals to adopt an HRO like organizational process



During the Phase 1 (January to mid-March 2020), professionals try to tackle the shock cause by the new coronavirus with the usual tools. Decisions, taking into account the political stakes, abide by the usual regulatory requirements and directives given by the Health Regional Agency. But the singular character of this pandemic renders the environment of hospitals completely fuzzy. The absence of visibility on the consequences of the decisions made by each level of the chain of command makes the situation uncertain. Professionals then quickly realize that and change tack modifying routines so that the organization can pursue its mission. They adopt of way of deciding similar to an HRO (Phase 2: mid-March to June 2020). Catastrophic errors are possible, usual routines are abandoned for new appropriate decisions whose effectiveness and impact are, however, largely unknown. In this total uncertainty, decentralization replaces centralization for more flexibility and adaptability; hence, the persons who have the expertise make the decisions disregarding the hierarchical structure. Similarly the persons directly confronted with the problems, find solutions themselves. From 11 May (Phase 3 - officially with the end of the period of confinement) hospitals return to the management model of Phase 1, without being prepared for the second big wave of contaminations. As a result, fatigue and pessimism set in.

3.2 Discussion of the results

The results of the research show that in the 4 hospitals, decisions are made in a different way during the three successive periods.
With the arrival of the virus (Phase 1), the establishments feel a 'cosmological shock'. The hospital they knew, does not exist any more. But at that moment, decision making remains the same. The hospital keeps on functioning as a bureaucracy. But this mode of functioning is inadequate to tackle the situation. So the establishments adopt an *ad hoc* management (Phase 2) with more flexibility setting aside many rules and deciding in a decentralized way. It is a

‘managed strategy’ in a situation of uncertainty relying on an evaluation of the risk-benefit ratio (Cuvelier, 2013). In spite of the success, considering the conditions, of this approach, the return to ‘normalcy’ is organized from May 2020 (Phase 3). The Health Regional Agency and the hospitals resume their classic mode of functioning, each abiding by the rules set by those who have the formal power to make decisions, which results in a loss of innovativeness, experience and a re-centralization largely responsible for the relative unpreparedness when the second big wave of contaminations arrives.

The results of this research shows that the organizational characteristics of a bureaucracy *à la Weber* are not adapted to sudden changes and a high level of uncertainty, as bureaucracies need a stable environment (Mintzberg, 1978). These results also show that bureaucracies in the event of a radical upheaval in the environment can find the capacity to put the bureaucratic structure between brackets, and to find solutions with the current to manage the uncertainty. However, when things become ‘normal’, or look like being ‘normal’, again, the bureaucratic organization is quickly back. It seems impossible, and it most probably is, to succeed in working out a blend of the two types of organizational approaches and establish a ‘flexible bureaucracy’ (Bigley and Roberts, 2001).

Conclusion

This exploratory research shows how, in 2020, hospitals resisted the sanitary crisis in spite of their weak states, and validates the hypothesis that this was possible by adopting some of the organizational processes of a High Reliability Organization (Roberts et al., 1994). The research has identified three phases in the behaviour during the crisis. In Phase1, professionals were confronted with a ‘cosmological shock’ (Weick, 1933), but continued to operate in their usual way as a vertical, centralized and bureaucratic organization. In Phase 2, realizing that this approach is totally ill-adapted to tackle the crisis, they changed tack and adopted a flexible, decentralized, un-hierarchical approach, which is against their nature, but which worked considering the environmental conditions. In Phase 3, the hospitals returned to the *status quo ante*, as ‘authorities’ at the national, mainly for political reasons, regional, because of the *raison d’être* of Health Regional Agencies, and hospital, because of their bureaucratic intrinsic nature, levels considered that the situation has become ‘normal’ again, which was of course totally wrong.

It would be then interesting to promote the idea that hospitals could become ‘flexible bureaucracies’ as defined by Bigley and Roberts (2001) and operate a blend between the approaches, if not permanently or synchronically, which a seems to be a contradiction, but successively or diachronically, when a sudden, unexpected and lethal crisis occurs.

This research is of course knows limitations as only four establishments were studied in the same region of a single country. Was the behaviour of other establishments in other regions similar? And how did health establishments behave in other countries in front the same sanitary crisis?

This research shows that, contra intuitively, big bureaucracies, such as hospitals, can mobilize their resources to act in a way similar to HROs, when they are constrained by the environment. From a managerial point of view, the research shows how the theory of HROs can be operationalized. The coronavirus pandemic is a *cas d’école* about what can be done when all referentials, rules and procedures have fallen apart. It should entice managers to review the modalities of the monitoring of establishments.

References:

ATIH (2019). *Analyse de l'activité hospitalière* 2019, disponible en ligne, consulté le 27 janvier 2023 : https://www.atih.sante.fr/sites/default/files/public/content/3910/synthese_activitehospitaliere_2019.pdf

Avenier M.-J., Gavard-Perret, M.-L. (2012), Inscrire son projet de recherche dans un cadre épistémologique, *in* Gavard-Perret, M.-L., Gotteland, D., Haon, C. et Joliber, A. (eds) *Méthodologie de la recherche en sciences de gestion. Réussir son mémoire ou sa thèse*, 2ème édition, Paris, Pearson Education France, 11-62.

Bigley G.A., Roberts K.H. (2001). The incident command system: High-reliability organizing for complex and volatile task environments, *Academy of Management Journal,* vol. 44, n° 6, p. 1281-1299.

Bourrier M. (2001). Organiser la fiabilité. L'Harmattan, Paris.

Blatt R., Christianson M. K., Sutcliffe K. M., and Rosenthal, M. M. (2006). A sensemaking lens on reliability. *Journal of Organizational Behavior*, 27 (7), 897-917.

Contandriopoulos A.P., Denis J.L., Touati N., Rodriguez R. (2001). Intégration des soins : dimensions et mise en œuvre. *Ruptures*, revue transdisciplinaire en santé 8 (2), 38-52.

Cuvelier, L. (2013). L'ingénierie de la résilience : un nouveau modèle pour améliorer la sécurité des patients ? L'exemple de l'anesthésie. *Santé Publique*, 25, 475-482. https://doi.org/10.3917/spub.134.0475

de Bovis C., Baret C. (2020). Améliorer l'efficacité du processus de procréation médicalement assistée : quels apports de la théorie des organisations à haute fiabilité ? Journal de gestion et d'économie de la santé, 5-6, 318-335.

de Bovis-Vlahovic C., Baret C.,Yalenios J. (2014). The contributions of the concept of 'high reliability organisation' to the improvement of safety and quality in French paediatric acute care services. *Journal de gestion et d'économie médicales*, 32 (5-6), 333-352.

DREES (2022). *Panoramas de la DREES - Les établissements de santé*, disponible en ligne, consulté le 27 janvier 2023 : https://drees.solidarites-sante.gouv.fr/sites/default/files/2022-07/ES2022.pdf

Eisenhardt K.M. (1989). Building theories from case study research. *Academy of Management Review* 14 (4), 532-550.

Halgand N. (2003). L'accréditation hospitalière : contrôle externe ou levier de changement », *Revue française de gestion*, vol. nº 147, no. 6, pp. 219-231.

Hlady Rispal M. (2002). *La méthode des cas : application à la recherche en gestion*. De Boeck, Paris.

IGAS (2012a). *Évaluation de la tarification des soins hospitaliers et des actes médicaux*, tome 1, Inspection générale des affaires sociales.

IGAS (2012b). *Évaluation des effets de la tarification à l'activité sur le management des établissements de santé*, Inspection générale des affaires sociales.

IGF (2012). *Évaluation de la tarification des soins hospitaliers et des soins médicaux, Inspection générale des finances*, 2011-M-056-01.

Journé B. (2009). Les organisations de haute fiabilité, in Michel X., Cavaillé P. (ed.), *Le management des risques pour un développement durable. Qualité, santé, sécurité et environnement*. Dunod, Paris. 367-384.

Journé B., Raulet-Croset N. (2008). Le concept de situation : contribution à l'analyse de l'activité managériale en contextes d'ambiguïté et d'incertitude, *M@n@gement*, 1 (11), 27-55.

LaPorte T., Consolini P. (1998). Theoretical and operational challenges of 'high reliability organisations': air traffic control and aircraft carriers. *International Journal of Public Administration,* 21 (6-8), 847-852.

Langley A., Smallman C., Tsoukas H., and Van de Ven H. A. (2013). Process Studies of Change in Organization and Management: Unveiling Temporality, Activity, and Flow. *Academy of Management Journal*, 56, 1–13, https://doi.org/10.5465/amj.2013.4001
Le Menn J., Milon A. (2012). *Rapport d'information fait au nom de la mission d'évaluation et de contrôle de la sécurité sociale de la commission des affaires sociales sur le financement des établissements de santé*, Sénat.
Le Moigne J.-L. (1977). *La théorie du système général. Théorie de la modélisation*. Paris PUF.
Leveson N., Dulac N., Marais K., Carroll J. (2009). Moving Beyond Normal Accidents and High Reliability Organizations: A Systems Approach to Safety in Complex Systems. *Organization Studies* 30 (2-3), 227-249.
Madsen P., Desai V., Roberts K., Wrong D. (2006). Mitigating Hazards through continuing design- the birth and evolution of pediatric intensive care Unit. *Organization Science* 17 (2) 239-248.
March J.G, Olsen J.P. (1976). *Ambiguity and Choice in Organizations*. Universitetsforlaget, Oslo.
Martelli P.F., Rivard P.E., Roberts K.H., (2018). Caveats for high reliability in healthcare. *Journal of Health Organization and Management*, 32 (5), 674-690,
Miles M. B., Huberman A. M. (2007). *Analyse des données qualitatives*. De Boeck, Bruxelles.
Mintzberg H. (1982). *Structure et dynamique des organisations*. Éditions d'Organisation, Paris.
Mintzberg H. (1978). Patterns in Strategy Formation. *Management Science,* may, vol. 24, p. 934-948.
Perrow C. (1984). *Normal Accidents: Living with High-Risk Technologies*. Basic Books, NYC.
Rivière, A. (2022). Tensions de rôle et comportement innovant au travail : quel défi pour les cadres de santé à l'hôpital public ? *Politiques & management public*, 2, 151-179.
Roberts K.H. (1990a). Managing High Reliability Organizations. *California Management Review* 1, 101-113.
Roberts K.H. (1990b). Some Characteristics of High Reliability Organizations. *Organization Science* 1 (2), 160-177.
Roberts K.H., Bea R. (2001a). When Systems Fail, *Organizational Dynamics* 29 (3), 179-191.
Roberts K.H., Bea R. (2001b). Must accidents happen? Lessons from high-reliability organizations. *Academy of Management Executive* 15 (3), 70-79.
Roberts K.H., Stout S.K., Halpern J.J. (1994). Decision Dynamics in Two High Reliability Military Organizations, *Management Science* 40 (5), 549-684.
Rochlin G. I., LaPorte T. et Roberts K. H. (1987). The Self-Designing High-Reliability Organization: Aircraft Carrier Flight Operations at Sea, *Naval War College Review*: 76-90.
Van Haeperen, B. (2012). Que sont les principes du New Public Management devenus : Le cas de l'administration régionale wallonne. *Reflets et perspectives de la vie économique*, LI, 83-99.
Veazie S., Peterson K., Bourne D. (2019). *Evidence brief: implementation of high reliability organization principles*. Department of Veterans Affairs, Washington (DC).
Véran O. (2016). *Mission sur l'évolution du mode de financement des établissements de santé*, rapport d'étape.
Volberda H.W. (1996). Toward the flexible form: how to remain vital in hypercompetitive environments, *Organization Science*, vol. 7, n°4, p.p. 359–374.
Waller M.J., Roberts K.H. (2003). High reliability and organisational behaviour: Finally the twain must meet. *Journal of Organizational Behavior* 24 (7), 813-814.
Weick K.E., Sutcliffe K.M. (2001). *Managing the unexpected*. Jossey- Bass, 2001.
Weber, M. (1994). *Le savant et le politique*. (J. Freund, E. Fleischmann, & É. de Dampierre, Trans.). Paris, France: 10-18.
Weick K.E. (1987). Organizational culture as a source of high reliability. *California Management Review* 29, 112-127.

Weick K.E. (1993). The Collapse of Sensemaking in Organizations: The Mann Gulch Disaster, *Administrative Science Quarterly*, Vol.38, n°4, p. 628–652.
Weick K.E. (2011). Organizing for transient reliability: the production of dynamic non-events. *Journal of Contingencies and Crisis Management* 19 (1), 21-27.
Weick K. E., Roberts K.H. (1993). Collective mind in organizations: Heedful interrelating on flight decks, *Administrative Science Quarterly*, 38, 357-381.
Yin R.K. (2017). *Case Study Research and Applications*. Sage, London