Experience Feedback capitalization of COVID'19 Management in the city of Troyes

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ABSTRACT

All countries have to face the COVID'19 pandemic and its heavy consequences. This sanitary crisis differs from all others in terms of the quick spread of contaminations, the high number of deaths (more than 5,5 Million globally and 123,893 in France) and the accrued number of patients hospitalized and induced in intensive care units. All sanitary procedures have proven to be inadequate. Several actors at different levels, whether international, European, national and local, as well as at the level of public and private organizations have been involved in the management of this type of crisis. These actors deal with different aspects of it, i.e., health, people protection, and economic and social situations. Existing procedures revealed a big lack in the relationships between different local and departmental actors. We did a number of interviews with strategic actors addressing the COVID'19 crisis in the City of Troyes. The objective of these interviews is to identify lessons learned from their experience feedback about relational problems and modifications needed. We present in this paper the first results of this study.

Keywords

Experience feedback, MASK method, COVID19 crisis Management, actors' relations formalization

Introduction

Even though medical actors have been prepared to deal with sanitary crises, they faced multiple challenges in the management of theCOVID'19 pandemic. Different problems have been identified especially in terms of coordination and interdependencies between the actors addressing this type of crises who are not limited to medical staff and institutions, but also include different actors such as Emergency and rescue actors, Hospital administration, Regional Health Agencies, Ministry of Health, Socio-medical Agencies, Government delegates, communal and departmental leaders and organizations, death organizations, Ministry of Economy, public communication organizations, Minsitry of Borders, etc. While these different organizations did indeed interact with one another priority to COVID'19 crisis, they were required to identify their mutual interdependent activities and to modify their activities in order to consolidate coordination efforts. We present in this paper, their experience feedback putting on activities' modifications and problems. At the end of this paper, recommendations based on the capitalization of these problems are offered.

COVID '19 CRISIS SITUATIONS BETWEEN 2020-2021

The onset of the COVID'19 pandemic and ensuing crisis took place in Wuhan, China. It largely spread to the world due to its high index of contamination and the movement of populations. The consequences of this virus, around the world were very heavy due to the high number of deaths. The entire human race had to face the ramifications of the pandemic, similarly to a world war due to the high rate at which the virus and its mutations were spreading. In fact, 324 million contaminations and 5,53 million deaths have been recorded by December 2021 around the world. In France alone, for instance, 13,4 million contaminations and 124000 deaths were recorded[1]. Health organizations, generally deal with pandemics such H1N1, plagues, Ebola, ... While they had defined a specific plan in order to face this type of pandemics (Figure 1),it was revealed that it was inappropriate to address COVID'19. These organizations had to be reorganized and to work with other social and economic organizations. This paper shows the organizations reorganizations' changes in a small city (Troyes, on the North-East, first department touched by the virus in 2020) in France based on the experience feedback of emergency and health organization actors.

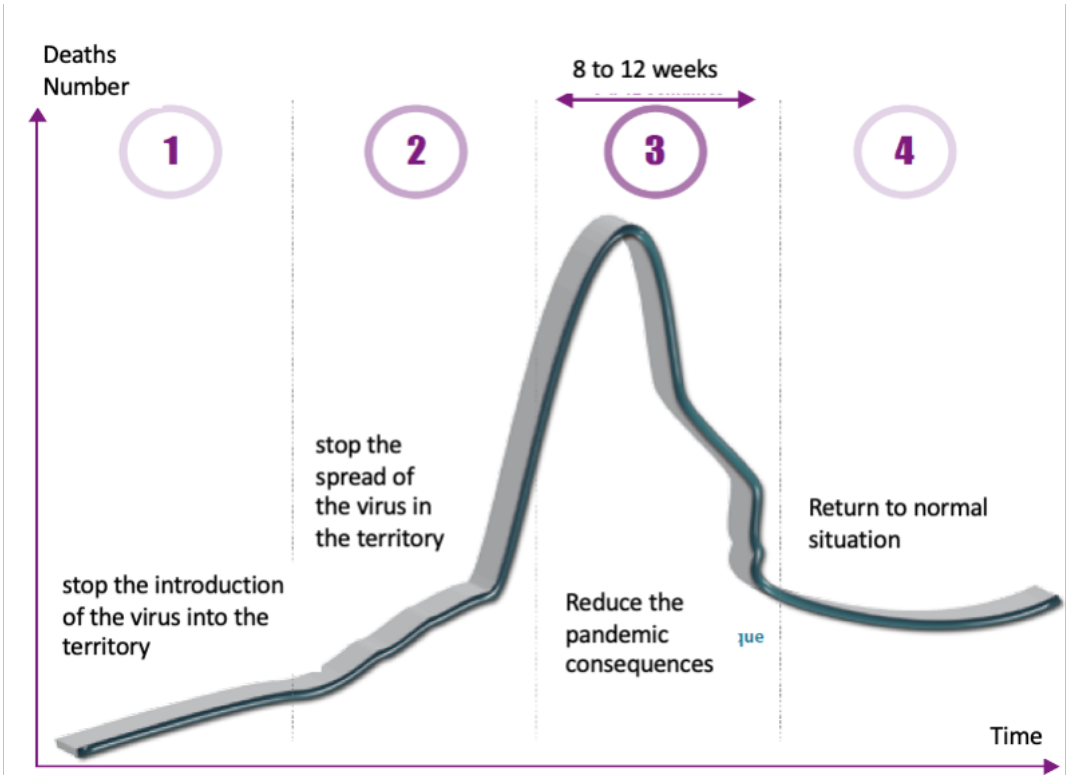

Figure 1. Pandemic Plan of French Health organizations [2]

SANITARY ORGANIZATIONS DEALING WITH COVID'19 CRISIS IN TROYES

Different actors are included to manage territory crises in France. The ORSEC Plans[3] identify different functions for each security actors along with the crisis and corresponding gravity and extension (Figure 2). The first actor concerned by a crisis is the mayor who has to identify the gravity of the situation and requires the help of the Government Delegate and Department who coordinates means. They can ask means and directives from French national institutions and ministries as well as and European organizations.

[1] https://www.santepublique

[2] *pandémie grippale" n°850/SGDSN/PSE/PSN d'octobre 2011. octobre 2011. S.l. : Secrétariat Général de la Défense et de la Sécurité Nationale. p.11.*

[3] PREMIER MINISTRE, 2019. *Circulaire n°6095/SG du 1er juillet 2019 relative à l'organisation gouvernementale pour la gestion des crises majeures*. p. 8.

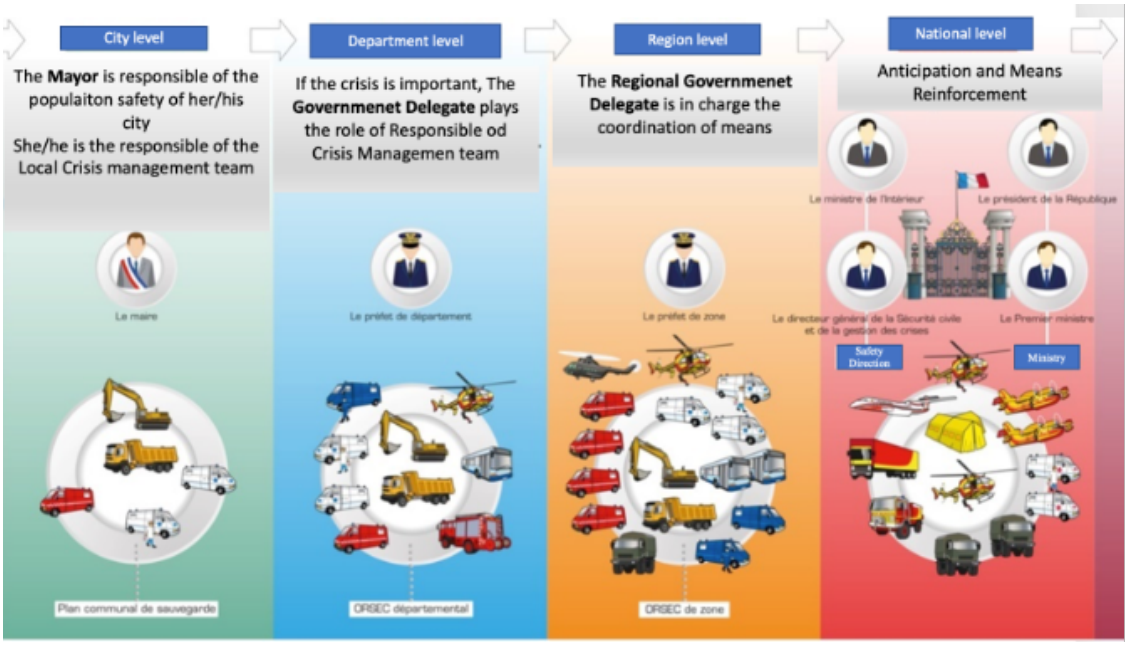

Figure 2. ORSEC Plan[4]

Troyes is a small city with several spread geographic agglomerations and rural villages. There in one central public Hospital at the city with several private clinics and medical centers spread around the city and in big villages (Figure 3).

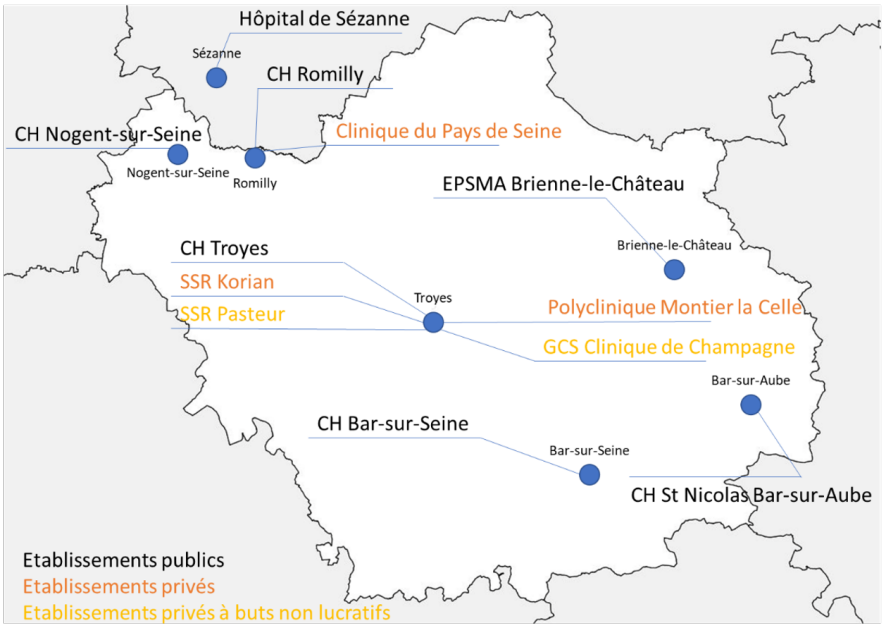

Figure 3. Medical centers and hospitals in Troyes city and its agglomerations.

These centers are quickly overwhelmed by COVID'19 patients. For instance, in April 2020, 225% of hospitalizations were all in Intensive Care Unit. Figure 4 gives an example of the situations of medical centers in Troyes and agglomerations.

[4] PREMIER MINISTRE, 2019. *Circulaire n°6095/SG du 1er juillet 2019 relative à l'organisation gouvernementale pour la gestion des crises majeures*. p. 8.

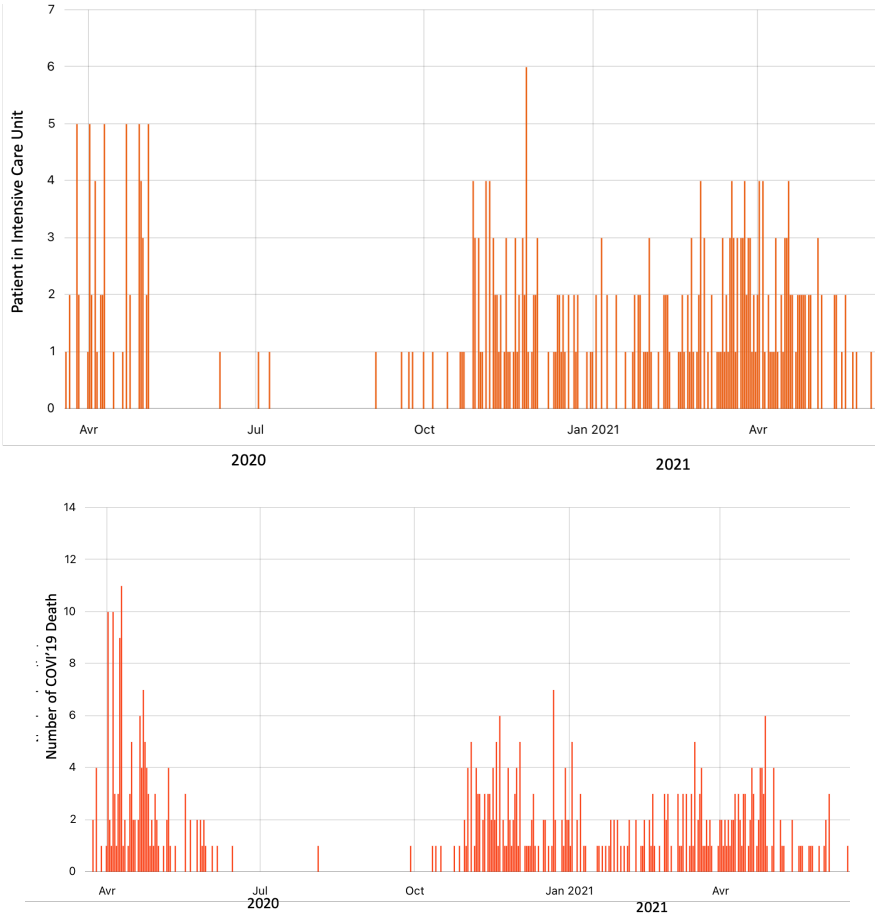

Figure 4. The situation of Troyes Medical centers due of COVID'19 [5]

Due to this problem, crisis management actors and medical centers reorganized their services and coordination systems in order to face this pandemic. We interviewed a number of these actors in order to identify the main elements of these changes with a special focus on factors that contribute to failures and successes of this crisis management.

EXPERIENCE FEEDBACK CAPITALIZATION

Several methodologies can be used to capture and formalize the experience feedback of actors in crisis management, brainstorming, interviews with relevant actors, knowledge capitalization techniques, etc. This feedback is important to identify key elements to be considered in process, directives and organizations changes and to learn from the crisis management organization (Antonacopoulou et al, 2014). We focus in our work on relationships between organizations, related to the main requirements of the National Health Agency and the Troyes Emergency departments.

Cartier et al, (2020) studied the resilience of touristic communities in the face of environmental disasters like wildfire based on experience feedback formalization. They put out three main questions: constant communication between actors, identification of resilient communities and continuous resilience process management. G. Prayag (2018) emphasizes on the importance of relationships between actors and resilience in tourism. Based on this type of studies, the interactions\ modes between different actors that face a new type of crisis such as COVID'19 can lead to the identification of some recommendations for sanitary organizations and population resilience.

Methodology of Experience Feedback

25 semi-supervised interviews have been done with actors belonging to different organizations in the Spring of 2021:

1. Department organizations:

[5] https://www.coronavirus-statistiques.com/stats-departement/coronavirus-nombre-de-cas-aube

   a. The Department Government Delegate,
   b. Department Health Agency: The Director, the City responsible and the Defense and crisis referent
2. City Mayors:
   a. Six Rural mayors
   b. Troyes Health responsible
   c. Troyes's mayor delegate
3. Hospitals:
   a. The President, the Director and the Health Responsible of Troyes Hospitals Group
   b. The Emergency department Responsible
   c. Two directors of private hospitals
4. Safety organizations
   a. An Elderly house director
   b. One House help association director
   c. One local Firefighters' organization responsible
   d. One City doctor
   e. One SOS Doctors member

These interviews were guided by two objectives, first one was identifying relationships between different actors and the second one was emphasizing the problems encountered during the COVID'19 management. The constraints MASK model (Figure 5) has been used in order to identify these elements. MASK (Matta et al, 2002) is a knowledge capitalization method used in several companies. A co-building model with expert is recommended in this approach that helps to identify in pertinent ways the main points to take into account in an activity. In MASK, several modeling guides, based on systemic and cognitive modeling theories, are projected in order to show the process, goals of tasks, problem solving methods, main concepts used and the influence of rules and constraints in activities. In our work, we use the constraints model (Figure 5) to show the influence of relationships in COVID'19 Management and problems to avoid.

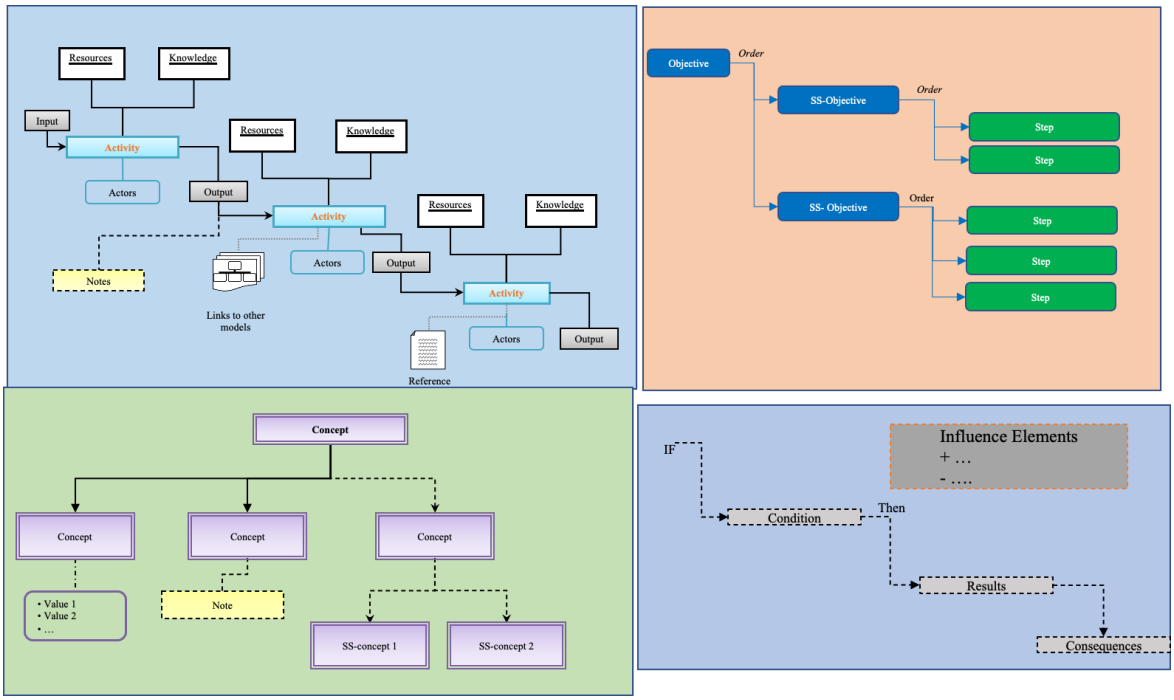

Figure 5. MASK Models

First Results

Several ontologies have been defined for crisis management. We can note for instance, ISYCRI models (Benaben, et al,2008) for crisis coordination that distinguishes between treatment system procedures, process, resources and actors from studied situations. In the studied system, concepts such as civil society, people, goods, natural sites, event risks, indicators and dangers, help to describe the situation. MOAC (Limbu, 2012), represents mainly classes as Affected Population, Collapsed Structure, Compromised Bridge, Deaths, Infrastructure Damage and properties affected by an impact. Moreover, categorizing damages and resources are identified on SoKNOS (Babitski et al., 2011). POLARISCO (Elmhadhbi et al, 2021) gathers different modules related to different actors in crisis management (PCC or Alert, Police, Firefighters, Public Authorities, Heath Medical and Gendarmerie) (**Errore. L'origine riferimento non è stata trovata.**).

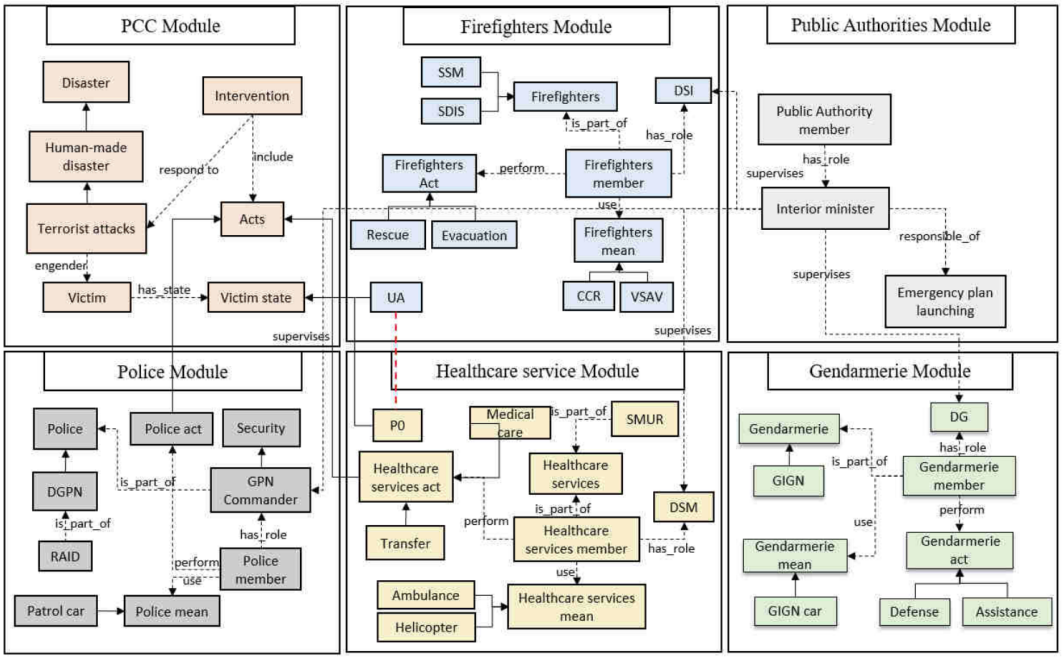

Figure 6. POLARISCO Ontology modules (Elmhadhbi et al, 2021)

In these ontologies, main concepts are identified without distinction between strategic and operational levels on crisis management. The identified concepts are of generic nature to represent several crisis management types or specific close to operational level as those defined for Rescue operations in ReSont ontology (Chehade et al, 2020). In our study we interview actors involved on strategic and decision-making levels. In light thereof, we have to emphasize on organizations needed to manage sanitary and especially COVID'19 situations. The main distinction was between public and private organizations. Then, medical, social and government organizations are identified within the public sector as a concept to consider. When studied, private actors are also taken with a consideration for the medical, economic and social dimensions (Figure 7).

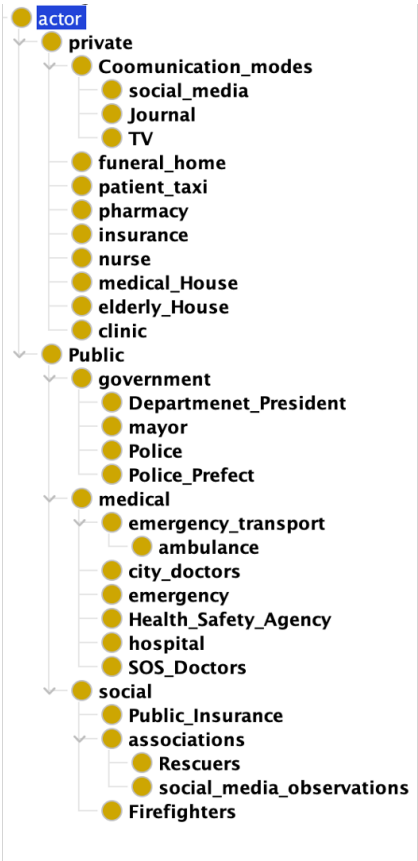

Figure 7. Actors involved in sanitary crisis management

The use of MASK constraints model guides us to identify needs and problems to address the COVID'19 management. In fact, medical treatment and hospitalization capacities as we can firstly note, have been identified as the important dimension to consider when analyzing constraints models co-built with interviewed actors. However, other aspects such as the availability of self-protection means, rapid information sharing and cooperative decision making with actors from different organizations and especially public and private ones have to be also contemplated. Economic and social tools must also be used in order to reduce the spread of the virus and to prevent depression cases within the population due to several lockdowns. In this study, we focus especially on the need to deal with sanitary situations, and on the empowerment of medical systems in a way that allows them to care for patients and to prevent cases of death. Several relationships actions have been identified in order to respond to these needs (Figure 8):

- collaboration between public and private organizations,
- definition of new health organizations including new actors as Transport, social houses, medicines shops, city medical houses, etc.
- Transparency and Information sharing that leads to trust between actors
- Definition of new procedures including Frequent debriefing meetings with all these organizations.

Problems as volunteer relationships between some actors and top-down directives without considering local situations are defined as failure conditions.

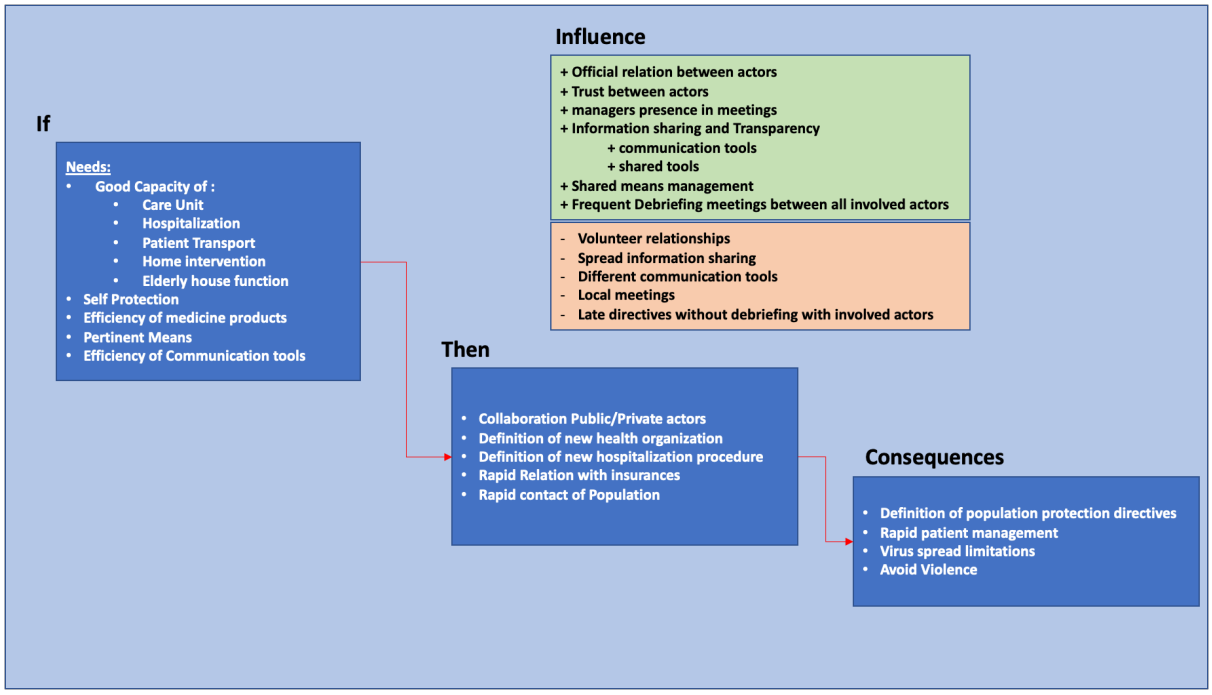

Figure 8. Example of COVID'19 management experience formalization using MASK Constraints model: Linking between Needs, Problems and crisis management Consequences.

Recommendations

Several lessons have been learned when analyzing these models. These lessons push towards a standardization of relationships between different actors who can be involved in sanitary crisis management. We can mainly note:

- Foster long-term and permanent relationships in order to promote the trust between actors and make easy information exchanges and collaborative decision making.
- Enhance territorial experience feedback and especially local crisis management experience capitalization in order to adapt directives define adequate procedures and plans.
- Promote partnerships between public and private medical and social organizations in order to install new activities modes and workflows.
- Define information and experience sharing tools in order to promote best practices and learning communities.
- Consider the integration of different actors in the sanitary procedures (ORSEC Plan) from the beginning of crisis management and define new collaborative decision making and debriefing modes.
- Give more responsibilities to local managers who can adapt national directives and consider real and territorial situation conditions
- Schedule frequent similar sanitary exercises and training in order to maintain relationships between all actors involved in this type of crisis.
- Set up mobile teams in order to touch base with and treat rural and isolated zones.

These recommendations will be discussed in the Regional and National Health Agencies towards modifications of directives and plans from one side and definition of several actions getting ready to manage sanitary crisis.

Conclusion

Maintaining trust and good relationships between different actors in crisis management is the main base of awareness towards efficient collaboration and sound decision-making. The COVID'19 crisis attests to the shortages in existing sanitary procedures especially in the collaboration and coordination between actors. In fact, medical actors usually work together, even more so at the level of public institutions. However, to face the COVID'19 pandemic, there is a pressing requisite to reorganize collaborations and relationships between public and private, medical, economic and social organizations. In this paper, experience feedback has been capitalized

using the MASK method show this type of lacks. Different needs and problems have been identified associated with the capacities to provide a medical treatment for COVID'19 patients. The analysis of results leads to a number of recommended actions in order to address similar sanitary situations at a city level. We aim to extend this work to also cover social and economic experiences. This work tends to identify relationships concepts in order to enrich existing crisis management ontologies like POLARISCO (Elmhadhbi et al, 2021), MOAC (Limbu, 2012) or ReSont (Chehade et al, 2020). For this purpose, main types of actors have been identified. Recommendations can then be rewritten using properties and rules.

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