

**COORDINATION AND REGULATION IN CRISIS MANAGEMENT.  
RESPONSE OF THE HEALTH SECTOR TO DISASTERS. THE CASE OF THE  
2017 EARTHQUAKE IN MEXICO CITY**

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**ABSTRACT**

The present article describes and analyzes how Mexico City's health sector organizations managed the crisis caused by an earthquake in 2017. The research question is how the city's health sector coordination and regulation mechanisms affected the way in which the crisis was managed. Our analysis assumes that the political and administrative infrastructure and characteristics of health care organizations have an effect on crisis management. The study method consisted in a case study narrative based on semi-structured interviews with health sector personnel and a review of public documents and formal regulatory instruments such as federal and local laws and internal norms concerning the operation of Mexico City's health sector organizations. We observed different types of coordination and regulation associated with different epistemic communities, as well as the availability of formal protocols and instruments for crisis management, which nevertheless operate in fragmented and complex systems.

**Keywords** - *Coordination, Regulation, Crises, Crisis Management.*

**INTRODUCTION**

Coordination and regulation have been crucial factors for the effectiveness and functional performance of public organizations and also for their capacity to face multiple and complex problems, such as the myriad challenges of public health care and the provision of welfare (Cassels, 1995). Coordination and regulation have also become essential for the provision of health services and social security.

In general, health care services are usually provided in complex scenarios, which sometimes become dynamic, especially when implementing reforms associated with new public management (NPM) and post-NPM approaches due to new ways to evaluate performance and higher specialization (Bode & Culebro, 2018; Romoren et al., 2011), but also when crisis and emergency scenarios present themselves where it is frequently

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necessary to improvise and override protocols (Wolbers et al., 2018). When facing unplanned situations, coordination and regulation systems need to produce immediate and accurate responses to manage and resolve emergencies. Thus, coordination and regulation problems affect the way in which crises are managed, affecting not only the government's response capacity but also its governance and legitimacy. For instance, the norms and values of different administrative agencies tend to collide into each other due to issues associated with institutional identity or differences in incentive schemes (Meyer & Hammersmind, 2006).

Even though coordination and regulation in emergency circumstances have gained importance in the wake of the recent crisis caused by the earthquakes in Mexico City in September 2017, few studies have addressed the organizational implications of crises on Mexican health systems. The starting point of the present discussion is that health care organizations then faced a situation in which their coordination mechanisms and normative instruments had to be employed to deal with the crisis despite the fragmented nature and particular characteristics of the system.

The research problem resides largely in investigating how the city's health sector coordination and regulation mechanisms affected the way in which the crisis, as an scenario where the government may be compromised, was managed. In some cases, these problems can be due to a certain degree of distrust of institutions and negative perceptions on the performance of public institutions held by citizens (Askvik et al., 2011). Coordination can manifest itself in different ways and give shape to specific types of configuration, for example, coordination can establish working practices and affects the functioning of the various organizational units within institutions via the formal hierarchical structure or through informal relationships (Mintzberg, 1980). Other forms of coordination are associated with the traits of inter-organizational relationships (Vlaar et al., 2007) or with the functioning of intergovernmental relationships and the so-called multi-level government (Painter, 2001). Here, interactions between power and trust play critical roles both at the intrapersonal and the structural levels (Bachman, 2001).

Coordination problems and the adverse situation itself can become more complicated during crisis situations, when the crisis takes place simultaneously with the development of administrative reformation and institutional change processes, and more so in the context of growing specialization and fragmentation that can be observed in the public sector (Halligan, 2010). An approach adopted by some governments to face these challenges consists in paying attention to organizational culture, public policy cycles, and government structure (Verhoest et al., 2007). For its part, the health care sector presents a remarkable presence of hybrid and complex systems (Simonet, 2015).

Coordination can take different forms. The present study understands the concept as a series of actions continuously performed by interdependent actors who negotiate their decisions to achieve specific common goals (Koop & Lodge, 2014). During crises, this concept takes on a special nature in which ambiguity and uncertainty play critical roles, although solutions tend to be successful provided that expectations are shared (Wolbers et al., 2017).

Our interest in this paper is to examine how the coordination among Mexico City health care organizations unfolded during the crisis resulting from the September 2017 earthquake.

### *Data sources*

The research method is a case study developed using an explanatory (Harrison, Birks, Franklin, & Mills, 2017) and qualitative approach. Field information was obtained from six semi-structured interviews administered and recorded in audio at the interviewees' workplaces using data saturation criteria (Saunders, Sim, Kingstone, Baker, et al. 2018). Interviewees included doctors, health organization managers, health care infrastructure staff, one rescue services manager, and health services users. The interview solicited information about the degree of horizontal and vertical coordination during the crisis ensuing from the September 2017 earthquake expressed as either protocol compliance or improvisation among health sector organizations in Mexico City, as well as the effectiveness of the coordination with the federal government.

Interviewees were: 1.- a specialist physician at Dr. Darío Fernández Fierro General Hospital, which is a second-level facility of the Institute for Social Security and Services for State Workers (ISSSTE), that was damaged during the earthquake; 2.- an engineer who led the internal civil protection unit at Federico Gómez Mexican Hospital for Children, a third level facility reporting to the federal Health Secretariat; 3.- a doctor at ABC Medical Center, a third-level private hospital that provided free care to people injured by the earthquake; 4.- an ISSSTE manager who provided a general panorama of the crisis; 5.- an administrative employee who of the Mexican Social Security Institute (IMSS); 6.- the Executive Director of the Medical Emergency and Rescue Squad (ERUM), who provided a broader perspective on how the city faced the crisis; additional information was provided by: 7.- a Mexico City health care services user; 8.- staff from a university, and 9.- an employee from the local health care services coordinating organization. All interviews focused on three different moments: before, during, and after the earthquake.

### *Crisis and crisis management*

The term crisis refers to an undesirable and unexpected situation that generates short phases of uncertainty, conflict, and chaos, all of which, in turn, produce adverse effects on the performance of a system that seemed to be operating normally (Boin et al., 2005). A crisis can affect a person, a group of people, or an organization, and it must be immediately addressed to prevent undesirable consequences. After long periods of stability, crises can take place abruptly and at a fast pace, taking administrations by surprise and threatening policies and their goals, institutional arrangements, and norms and values, exerting a pressure for transformation on the system that makes sound decision-making a vital necessity (Boin et al., 2005; Boin, Hart, & Kuipers, 2018; Christensen et al., 2016; Matthews, 2012).

Natural disasters, accidents caused by human activities, armed conflicts, terrorist attacks, pandemics, industrial or transportation accidents, and infrastructural failure are all examples of situations that produce crises (Boin et al., 2005; Christensen et al., 2016).

They usually appear as a result of accumulated vulnerabilities and pressure that eventually burst, or they can take the form of an adverse situation under development for which no obvious solutions are available. The concept of crisis can also be considered as a sociolinguistic construct since it represents a source of power for those who define the crisis and make decisions aimed at addressing it (Matthews, 2012). People's reference frameworks, experience, memories, values, and interests determine their perception of what a crisis is and construct the concept (Boin et al., 2018).

Studies of crises considers aspects of different theoretical approaches within the social sciences, such as organizational theory, psychology, political science and its international relations aspect, business studies, communication studies, and disaster studies, among others. This multiperspectival approach results in a combination of different points of view, necessary to understand the complexities and dynamics of crises and their management (Boin, Hart, & Kuipers, 2018). The present study relies mainly on organizational theory and institutional analysis to understand crisis management and its impact on critical sectors such as health care.

Proper management of crises can save lives, protect infrastructure, and restore the citizenry's trust in public institutions (Boin, Kuipers, Overdijk, 2013). This management function is one of the fundamental government areas, and the actions derived from risk management are crucial in strengthening both the population's ability to resist and the critical infrastructure networks (Baubion, 2012).

Damage can be limited when policymakers address a crisis adequately, but when they fail to do this, the impact tends to increase (Boin et al., 2005). As a result, the approach to crisis management must recognize the importance of the role of prevention and risk management, although it also accepts that crises can always occur. It leans toward the idea of preparing in advance for such eventualities because preparedness can represent the difference between a small incident and a major disaster. Crisis management also acknowledges the possible emergence of opportunities during extreme situations because crises can represent gains for certain actors (Boin, Hart, & Kuipers, 2018).

Crisis management is often deemed as a series of activities aimed at minimizing the impact of any crisis, including different stages: preparation, response, communication, and feedback analysis. Instruments intended to assess learning and the degree of structural linkage can be designed for each of these stages, and cooperation and coordination are crucial to understanding the effectiveness of the activities and the relationships among the actors and organizations involved, each of them seeking their own institutional interests and following their institutional logics. The implications and impact of this approach to management go beyond the different levels of government, and they may even affect the legitimacy and governance of public institutions (Ansell, Boin, & Keller 2010; Boin et al., 2005; Boin, Hart, & Kuipers, 2018; Boin, Kuipers, & Overdijk, 2013; Boin & Lodge, 2016; Matthews, 2012).

### *Crisis, coordination and management*

Due to the emotional component inherent to crises, governments and officials deal with the unknown as they negotiate with other administrative levels and national and international organizations and become involved with various actors and their particular agendas. In addition, they face constant social pressure by the media, and citizens are often highly demanding in their expectations of transparency, responsibility, and ethical standards. Also, authorities and officials see their response capacity reduced by decentralization and privatization. As a result, they must adapt their processes, structures, tools, and equipment to react immediately to the event or otherwise risk a political backlash amid criticism resulting from their ineffectual or inexistent response (Baubion, 2012).

Crises are difficult to predict and develop in unexpected ways, which demands simultaneous and coordinated actions from different organizations and government actors who must cooperate with one another and be able to improvise because established operation routines often become inadequate during crisis scenarios (Christensen, Laegreid, & Rykkja, 2012). These scenarios represent serious challenges for the officials responsible for making public policy, regulatory actors, and administrators for establishing adequate administrative structures to facilitate effective responses to crises and joint cooperative actions, by diverse actors and different levels of policy, as well as flexibility and efficiency to merge stability and organizational preparedness. Nevertheless, when these structures are in place, they become the foundations of an adequate response to fragmented political and administrative systems (Christensen et al., 2016).

Coordination mechanisms work differently during crises, and hierarchical structures or networks become an essential aspect of crisis management because crises and their implications overlap organizational jurisdictions. Therefore, crisis management require constant coordination among individual actors and organizations unable to resolve all of the problems caused by the adverse situation working on their own (Christensen et al., 2016; Boin & Lodge, 2016).

Two different theoretical streams, as Christensen et al., indicates (2016), can be used to understand coordination processes: the structural-instrumental perspective and the cultural perspective. These two views are not mutually exclusive. In the first view, coordination is vertical and horizontal in terms of hierarchy; the higher the hierarchy, the higher the level of authority to coordinate. Horizontally, the structural-instrumental approach examines the work carried out by different actors at the same level, generating networks of public servants from different areas and levels, as well as networks of governmental and non-governmental actors.

The cultural perspective focuses on the way in which the configuration of informal norms and values rooted in political/administrative systems affect decision-making processes, provided such values (and other historically acquired and constantly evolving traits) provide value, direction, and meaning to the organization's activities. This vision emphasizes a positive public sector culture, public values, and trust relationships because these traits explain how actors and decision-makers think and act in a bureaucracy (Christensen et al., 2016).

Coordination is a key element in the response to any type of crisis and disaster, and it takes two forms: intra-organizational or inter-organizational (i.e., horizontal or vertical). It pertains to international organizations as well as all government levels. Organizational and institutional learning play a central role in the coordination of different structures, regions, and levels of government (Christensen et al., 2016; Laegreid & Rykkja, 2016; Levitt & March 1988; Herriot et al., 1985). Lessons learned from circumstances before and after other crises can help to discover new solutions (Boin, Kuipers, & Overdijk, 2013); in the case of Mexico, relevant organizational learning can be obtained by analyzing the lessons from the previous major earthquake, in 1985. The health sector is perhaps one of the areas in which borders are most blurred. Collaboration and intermediation in the health sector can take many forms, for example, top-down intra-organizational professional collaboration, which can also serve as an epistemic bridge (Kislov et al. 2016), or as formally or informally established formal or informal horizontal inter-organizational mechanisms. Additional variables are the prevalence of hierarchical and network arrangements and the accuracy of the coordination's vision. Therefore, coordination takes various forms depending on the institutional capabilities of a country (Christensen et al., 2016). This heterogeneity can be especially marked in the health sector when it comes to anticipating crises and emergencies (Baekkeskov, 2016).

### ***Coordination and regulation during earthquakes in Mexico City***

#### *The 1985 earthquake. Toward the development of an institutional infrastructure*

Early in the morning on 19 September 1985, an earthquake struck Mexico's capital city with a moment magnitude of 8.0. Between 10 and 15 thousand people were injured, and more than 10 thousand lost their lives. Some hospitals were completely destroyed, for example, the Mexican General Hospital, Juárez Hospital, Primero de Octubre Hospital, and the National Medical Center (Sabido et al., 2014).

The characteristics and nature of the health care organizations played different roles in the different phases of the crisis. Immediately after the earthquake, private services and relief units were critical for facing the first consequences. Soon afterward, social security organizations took the responsibility of providing services. However, the lack of readiness of the city's public agencies and the lack of basic knowledge of civil protection measures among the population were evident. The lack of response by the authorities motivated the improvised and solidary intervention of thousands of citizens, who played a determinant role in alleviating the crisis; these actions have become an icon of Mexican civil society.

Changes were slow-paced. The federal government issued laws and created agencies that were replicated at the state and municipal levels. The General Civil Protection Act was issued in 2000 (DOF, 2000) and abrogated in 2012 (DOF, 2012); a new version has been amended several times (DOF, 2018a). A National Civil Protection System (SNPC) was created in 1986 (López-Levi et al., 2016) using an integrated risk management approach, and created conditions for vertical and horizontal coordination among organizations at all government levels, volunteer groups, civil society, the private sector, and educational and research centers. The SNPC's Organization Manual was issued in 2018 (DOF, 2018a).



The SNPC originated three entities: a) the National Center For Disaster Prevention in 1988, a technical-scientific organization responsible for the administration and promotion of risk mitigation and prevention policies based on monitoring, training, and research; b) the National Emergency Committee, intended as a coordination mechanism during crises and emergencies; c) the National Council for Civil Protection, which was created in 1990 as civil protection policy consulting, coordinating, and supervising unit (General Civil Protection Act) (DOF, 2018b). National protocols (SEGOB, 2010; DOF, 2015) have also been created by health care organizations (IMSS, 2016) and municipal and subnational governments, although these protocols are insufficiently known (interviews 6, 7, 8, and 9).

Subsequently, the SNPC was also replicated by state and municipal governments. Coordination Agreements to obtain the cooperation of local governments were signed. Thus, Civil Protection Internal Program commissions, in charge of internal coordination during crises emerged in schools and both public and private health care agencies in the three tiers of government. In addition, the armed forces created the DN-III-E Plan to support the civilian population in different disaster scenarios (DOF, 2018c).

A seismic alert system connected to speakers and a cellphone app is available in Mexico City to alert citizens as early as 40 seconds in advance, depending on the location of the epicenter. New regulatory schemes were approved to enforce stricter rules on the type, quantities, and quality of the materials used in building construction (Gaceta, 2017a), and the availability of staff trained in search and rescue procedures has increased. There are different laws (Gaceta, 2014), coordination instruments (Gaceta, 2017b), and training programs pertaining the three agencies in charge of emergency response in Mexico City: the Fire Department, the Mexican Red Cross, and the ERUM, and the three agencies meet periodically. Interviews revealed social learning as a result of the gradual maturation of the institutional infrastructure (interviews 2, 3, 4, 6, and 9).

Despite the efforts to achieve vertical and horizontal coordination, Mexico has been characterized by a lack of competent public administration (Christensen & Lægheid, 2005) and traditionally deficient coordination mechanisms (Aguilar, 2011), which have hampered the implementation of the SNPC. After three decades, the different disaster response systems have taken few steps toward a civil protection culture and have focused mostly on drills. The lack of massive training for the citizenry who provides support in crises often results in duplicated functions and obstructs the activities of specialized staff (interviews 2, 4, and 6). The potential of this extremely rich cultural trait for facing disasters is therefore mostly wasted.

### *The health system in Mexico City*

The National Health Care System, established by the 1984 General Health Care Act, is comprised by federal and subnational public administration agencies and individuals or companies from the social and private sectors that provide health care services (DOF, 1984, article 5). The Mexico City health care system includes administrative units, decentralized government agencies and bodies, and individuals or companies from the public and private sectors providing health care services (Gaceta, 2017c, article 6).

Three federal agencies are responsible for the provision of health care services: a) the IMSS, which serves private sector workers; b) the ISSSTE, which serves public sector workers; and c) the Health Secretariat (SSA), created for providing medical assistance to people who are not affiliated to either the IMSS or the ISSSTE. The program called Seguro Popular (Popular Insurance) operates cross-sectionally between the IMSS and the ISSSTE. There are also health care agencies created by subnational governments.

Health care is divided into three levels. The first level includes the Family Medicine Units, Health Care Centers, and Family Clinics, providing essential health care services for 80% of health problems. The second level consists of the general hospital, as well as regional, integral, community, pediatric, and obstetric and maternal and children's health hospitals, besides federal hospitals intended to provide nationwide services. Patients referred by the first level for diagnostic, therapeutic, and rehabilitation procedures are served by the second level. If necessary, they are admitted for specific surgical or clinical treatments. Finally, the third level is a network of highly specialized hospitals prepared to deal with more complex, low-prevalence, and high-risk diseases in patients referred by the second level. These hospitals are the National Medical Centers, High Specialty Medical Units, the National Institutes for Health, and the six High Specialty Regional Hospitals.

The national health care infrastructure is markedly centralized in Mexico City, which is also the core of the country's urban system and home to 8 million inhabitants<sup>2</sup> Six federal-level agencies run hospitals in Mexico City: the SSA, the IMSS, the ISSSTE, the Social Security Institute for the Mexican Armed Forces, PEMEX Medical Services, and the National System for the Integral Development of the Family. At the local level, the Mexico City Health Secretariat operates 211 facilities, 17 specialized clinics, one specialty hospital, 12 general hospitals, seven pediatric and maternity hospitals, 10 pediatric hospitals, two toxicology specialty clinics, and four medical units in prisons, in addition to legal medical services and several mobile units. These facilities employ 30 thousand 863 employees; 2 thousand 426 beds and 106 operating rooms are available, and almost 2.5 million outpatient services were provided in 2018 (SSCDMX, 2018).

### *Coordination and regulation during the 2017 earthquake*

Exactly 32 years after the 1985 earthquake, only a few hours after a commemorative drill, another earthquake struck; this time, the estimated magnitude was 7.1, 238 people were killed, 1,500 were injured, and 39 buildings collapsed (interviews 6 and 9). Unlike the first event, the hospital infrastructure sustained only minor damage, and only three buildings had some problems, but their operation never stopped. The most severe damage to health sector facilities affected the Mexico City Public Health Services headquarters, and alternative command centers were set up to coordinate activities in the 16 health jurisdictions of the city's health system. A red alert to warn hospitals about the possibility of a patient surge was activated for hospitals to suspend scheduled surgeries (Ahued-Ortega, 2018). The damage was limited, among other things, because institutional learning processes had taken place. A heritage of institutional infrastructure composed of



regulation and coordination instruments was already in place when the second earthquake occurred (interviews 2, 3, 4, 6, and 9).

At the time of the emergency, the city's health care infrastructure seemed to be saturated by the large numbers of injured people who sought attention (interviews 1, 4, and 6); however, this is not entirely true because clinics, health care centers, and hospitals are permanently saturated or nearly saturated not only in this city, but all over the country, due to the combined effect of population growth and the incorporation of millions of new users to the "Seguro Popular", which is a public health care system for the population in general, created in 2002, which overwhelms available staff (interviews 1, 7, and 9). Thus, the performance of the health care infrastructure was not optimal during the crisis (interview 6).

Coordination and collaboration among the different medical organizations appeared to be limited in most cases, far from the type of orchestration expected to be established by national regulatory instruments (Wolbers et al., 2018). As a result of insufficient adherence to rules and regulations, civil protection operations were conducted separately by subnational governments and hospitals according to the health care level provided by each one on their own (interviews 4, 6, and 9). The political will of the city's authorities provided important support; the Head of Government aptly appointed his cabinet secretaries to coordinate the works in neighborhoods where housing buildings collapsed. As a result, civilians and soldiers, rescuers and victims, all collaborated despite that the secretaries had no civil protection training (interviews 6 and 9).

The Civil Protection Internal Program (PIPC) introduced strong regulations for Mexico City (CDMX) hospitals. Third level hospitals are required to be certified and to have a PIPC in place, prepared by a third party, as well as qualified human capital led by a civil protection specialist who becomes acting hospital manager, controls access, cordons off the perimeter, and stays in contact with hospital management during emergencies. A PIPC includes a schedule for drills, training sessions for staff, visitors and patients' families, and shift rotations in order for qualified personnel to be available 24 hours per day throughout the year to take the lead during an emergency. It also includes an atlas of surrounding risks and the participation of a certified architect who must review the facilities after each crisis (interviews 2 and 3). A number of third level hospitals, both public and private, created a hospital council in 2017 on their own initiative; their representatives meet monthly to review procedures and standardize civil protection norms; some of these are the National Institute of Perinatology, the Mexican Hospital for Children, and the Siglo XXI National Medical Center (interviews 2, 3, and 6).

The existence and correct deployment of protocols allowed, for example, the Magdalena de las Salinas Traumatology Hospital, an IMSS third level facility, to increase its regular service capacity (interview 6). Similarly, some universities, such as UAM-Cuajimalpa and the Center for Research and Teaching in Economics, displayed an effective intra-organizational coordination when the earthquake occurred and during the ensuing phases of the crisis, especially in its immediate relationship with the local government (interview 8).

Nevertheless, there was at least one pitfall in the functioning of third level hospitals caused by the rifts between government levels. The ERUM, a group that manages an average of 300 emergencies per day in Mexico City, lacks direct communication via citizens band radio with the hospitals where emergencies are addressed—ERUM staff need to call the front desk to refer an injured person. The problem is compounded during a crisis due to the excessive number of calls (interviews 4, 6, and 9). During crises, communication should be established as one of the exceptional functions.

By contrast, the first stages of coordination among Mexico City's agencies were more harmonious. The ERUM can contact the Regulating Center of the city's Health Secretariat via the citizen's band radio to coordinate patient referrals to the right hospitals depending on the particular case and the availability of specialized staff and hospital beds. However, this kind of communication is inexistent at the subnational government level, and even hospitals located close to each other are unaware of the availability of medical staff and beds of their neighbours. This lack of coordination frequently a limitation for the optimal use of available equipment for patient transportation (interviews 6 and 9). These problems are even more evident during crises.

There are also other issues with the service of the ERUM. As a result of the excessive demand of services and lack of equipment in hospitals, the patient is admitted 3 or 4 minutes after the ERUM ambulance arrives at the hospital assigned by the Regulating Center, but after that, the ambulance staff cannot move the patient to a stretcher or bed in the hospital immediately, so they need to wait, sometimes for several hours, while the patient is in radiographic or blood analyses because specialized ERUM ambulances cannot leave their stretcher in the hospital, which slows down their work. The ERUM has improvised a solution of sending an additional non-specialized ambulance to provide the stretcher and wait for the hospital to return it while the specialized ambulance takes care of another emergency (interview 6). This situation illustrates how small details can obstruct the use of specialized equipment.

The directors of first and second level medical units are normally also in charge of the civil protection brigade, but these directors often lack formal training and are overwhelmed by the day-to-day management of the hospital. As a result, attention to civil protection activities is marginal or even inexistent if the director in charge is not at the hospital. These hospitals have a significantly lower budget and fewer options for high-level training, although they rarely request to the Center For Disaster Prevention for training courses (interviews 2, 3, 5, and 9), and their Civil Protection Internal Programs are actually only drafts. Nobody takes the responsibility of following up on basic measures regularly: emergency doors are secured by chains or padlocks to prevent theft; hallways are often obstructed by stretchers or chairs; emergency documentation and drills fail to plan for an overpopulated medical unit; the number of people inside the facilities would be unknown in the event of a crisis, and when the hospital establishes a new area, existing spaces are simply split, omitting a proper risk assessment. Units often lack emergency signage and evacuation routes. They also lack risk management specialists, so information on civil protection (such as evacuation routes, location of safety areas) provided to patients, families, and staff is limited or inexistent. In case of emergency, buildings are assessed by friends or family members of the staff (interviews 1, 2, 3, 6, 7,

and 9). Quite often, the recommendation is to allocate part of the budget to implement a true civil protection internal program.

The lack of resources is the main cause of the coordination problems observed during the earthquake in September 2017 and the activities that followed, such as the evacuation of patients to the streets. Patients in affected buildings were transferred from some second level hospitals three hours after the earthquake, and some were transferred six hours later thanks to personal calls made by doctors and other hospital staff, often from private vehicles (Wolbers et al., 2018). This situation was problematic since, as stated in the theory, immediate reaction is crucial in order to prevent undesirable consequences, in this case, in order to prevent negative effects over the citizenry's health provoked by aspects such as injuries or other medical problems. Regular services began to be organized 24 hours after the beginning of the crisis and they were normalized only 36 hours after the seism. Facilities were not assessed until after 48 hours. The worker union hindered activities in some hospitals (interviews 1, 7, and 9).

According to the ERUM, the lack of coordination among hospitals resulted in the dissemination of inaccurate information stating that saturation was complete, although some hospital units did have available beds (interview 6). This was offset by the intervention of private hospitals such as the ABC Medical Center, the Ángeles hospital group, and the San Ángel Inn Hospital, which provided free attention to patients during the emergency and afterward (interviews 1 and 3). However, coordination in crisis and emergency situations is also affected by other factors, such as training, the knowledge possessed by health personnel about the hospital infrastructure and their risk prevention mindset.

After the earthquake, initiatives to review, improve, and disseminate emergency protocols in a number of national health agency areas were halted, and high-level officials pointed out that these activities would be a fruitless effort for the federal administration because its six-year period was close to its end, in 15 months (interview 4).

### *Analysis*

The present article analyzes the way in which Mexico City's health care sector coordinated its different organizations to address emergencies during the crisis caused by the earthquake that struck the city in 2017. For this purpose, we examined the experiences of health care professionals, people who participated in civil protection activities, and health care services users to understand how health authorities managed the crisis.

Our results reveal the current state of affairs, in terms of organizational coordination and regulation, among the city's health care organizations when facing an earthquake-related crisis. There is scant literature on this matter despite that the country is characterized by its high seismicity. This study might open a research line focused on this city or other urban areas that need to manage crises recurrently, and comparative studies could also be conducted.

Among our findings, coordination seemed to be remarkably more problematic when it comes to the vertical dimension of the different levels of government. From an

instrumental point of view, there is a lack of an adequate level of leadership in the agencies or actors of national hierarchy, which results in coordination problems. For its part, horizontal coordination is more effective in the specialized health services. This situation indicates that actors at the same hierarchical level acted in coordination, but their coordination with actors in other levels was inefficient. As a consequence of the lack of vertical coordination, health care agencies are perceived as inefficient, and the legitimacy of both the local and federal government is adversely affected.

The underlying problem might well be that the formal regulation instruments have yet to be implemented and interiorized by the health care agencies, and their actors, created to deal with the management of crises, and that relevant learning derived from previous experiences has not yet been achieved. In other words, despite the fact that organizational and institutional lessons learned from the first seism has promoted interaction, communication, collaboration, and cooperation among private actors and with the public sector, this situation was not similar among actors and organizations within the public sector. It seems that the public health sector mainly dealt with the crisis not in accordance to the lessons learned and regulations established after the 1985's earthquake, but in accordance to cultural aspects and operational habits. The presence of laws, cooperation agreements, and protocols in all public entities can be attested, but their application is minimal, almost only in the form of earthquake drills every half a year. There are no permanent educational campaigns, programs to train brigades, and compliance with regulations is not surveilled.

Given that most health organizations tend to conduct their work with professionals within a certain type of epistemic community (Haas, 1992), standard routines, norms, and procedures become the main regulatory instruments for coordination among agencies, and they also improve intra-organizational coordination. That is, standardized skills and knowledge, as well as norms, play an important role during emergencies inasmuch as they are supported by training, both as a norm institutionalization process within the organization or as specialized training by third parties (Mintzberg, 1980), with the purpose of creating common expectations. Nevertheless, the analysis of the interviews indicates that coordination policies and inter-organizational health services have fallen short of expectations and the integration of health care systems needs to develop specific traits, such as flexibility and adaptive capacity (Suter et al., 2009), especially during crisis and emergency situations.

Another finding was associated with trust in institutions, and it refers to the need of political will among high-rank officials from different organizations in the health care sector to establish improved communication mechanisms that can break administrative barriers separating equivalent areas throughout the hospitals, especially those near to one another. This type of communication would allow for real-time data on the availability of beds, operating rooms, ambulances, and medical staff to address emergencies. Permanent contact helps to deal with crises in better conditions. Horizontal coordination can be improved by replicating initiatives of inter-hospital working groups in which representatives can share experiences and the status of their civil protection programs in monthly meetings.

## CONCLUSIONS

Mexico City and its health sector organizations have undergone two crises caused by earthquakes, in 1985 and 2017. The present article has shown that third level health care agencies have become differentiated and developed coordination mechanisms for facing crises, such as protocols and training, whereas first and second level agencies present a pattern of rudimentary and improvised operation, oblivious to regulations, where the scarce resources are not used optimally. For example, we observed that the coordination instruments created after the 1985 earthquake and used by Mexico City's health care organizations have plenty of room for improvement, and agencies maintain old habits and routines in which crisis scenarios tend to be forgotten. In other words, the cultural traits acquired gradually by health sector agencies prevailed as the first earthquake was forgotten and affected the way in which the agencies managed the crisis caused by the 2017 event.

A noteworthy element concerning the operation of coordination was the extensive citizen support during the emergencies. The role played by the citizenry and the private sector was undoubtedly important not only to deal with the crisis, but also to strengthen governance as a result of solidarity or due to the implementation of regulatory instruments. The historical trajectory and path-dependent trajectories of the 1985 earthquake showed how interactions between the private and public sectors increase in such a way that collaboration and cooperation norms and values were present during the crisis and they helped to build communication mechanisms for the different actors.

This situation allows and encourages citizen participation as a collective social action in which society intervenes voluntarily in public affairs associated with common goals (Merino, 2010); the promotion of governance is carried out not only during periods of crisis, but also in everyday scenarios in which trust-based relationships have been established. The implementation of civil protection courses universally, in schools, companies, and all types of organizations may help the system to seize the solidarity of the Mexican people.

Similar lessons could be learned from other situations involving disasters or emergencies where different actors play different roles, even if they operate within a given institutional infrastructure. For the health care sector, the main challenge is to find a balance between the certainty provided by bureaucratic procedures and adaptive capacity to face uncertain and dynamic conflicts flexibly in a scenario characterized by fragmentation and polarization, such as the Mexican health sector is despite the efforts made toward more effective integration in an increasingly globalized sector (Bode & Culebro, 2014; Culebro, 2017).

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The present article has presented different lessons learned from the experience of the earthquake. These lessons show that coordination among public health care agencies creates organizational cognitive schemes that translate into continuous training of voluntary hospital staff on different specialized areas, such as evacuation, first aid, search and rescue, or communications.

## NOTES

- 1 Some interviewees requested that their names remained confidential to be able to express themselves freely.
- 2 Mexico City is part of the metropolitan area of the Valley of Mexico, comprising areas of three subnational governments and home to almost 21 million people (SEDATU, CONAPO, INEGI, 2017).

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