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## Institutional Resilience and Disaster Planning for New Hazards: Insights from Hospitals

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# Institutional Resilience and Disaster Planning for New Hazards: Insights from Hospitals\*

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## Abstract

The objective of this paper is to present an institutional view of disasters derived in part from the results of a recent study of hospitals in the United States. It is offered in the hope that a focus on institution will help resolve the present lack of fit between, on the one hand, the increasing complexity of the new hazards and on the other, existing conceptualizations in the social sciences of disasters and emergency management that privilege the community. The paper uses information from 76 participants in 13 focus groups in acute-care hospital organizations in California, Tennessee, and New York to illustrate the argument for institutions. The implications of these findings for an institutional conceptualization of disasters are discussed.

**KEYWORDS:** institution, resilience, disaster planning, hospitals

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### *Introduction*

Researchers are increasingly sensitive to the evolution of new kinds of hazards. These hazards have characteristics that resist generally-accepted parameters for classifying them (such as geographic scope or speed of onset) and present scholars and practitioners with many challenges for understanding and enacting the organizational structures that are most effective for mitigating them or responding to subsequent disasters. These new hazards are characterized by spatial and temporal ambiguity—that is, they are not distinguished by definitive beginning and ending points or by readily-identified geographic boundaries. Yet the unit of analysis that has oriented research and application for decades—the community—is bounded in terms of place and social systems, and most of our theory is indexed to this scale, while the threats can not be readily localized.

We argue in this paper for introducing a new scale of analysis in disaster research, one that is sufficiently mutable to match the protean nature of the new hazards. This unit of analysis, institutions, has the advantage of both encompassing and extending communities as generally understood. Institutions, though place relevant, are not place-bound and some—hospitals, as we shall demonstrate in this paper—are not temporally-bounded, either, with respect to their view of hazards. Every instant for them contains a pre-crisis, crisis, or crisis-recovery task, since hospitals as an institution, by nature, exist to confront disruptions to *someone else's* normal. For them, there is no normal state, and they organize for and think about possibilities for disruption at all times. How they do this gives insight into the organizational adaptation necessary to confront change.

Although the imprecise span of institutions is an advantage relative to the imprecise scale of developing hazards, it is necessary to take sample from which certain inferences may be drawn. In this paper, we use findings from research in 13 hospitals in three areas of the United States. We do not, of course, argue that the community has lost all relevance for understanding hazards, but that the scale for understanding social response to hazards must be commensurate with the hazard, and that for many new hazards institutions provides a more appropriate scale.

There are at least two approaches to the conceptualization of the social organization experiencing disasters. One assumes a functionalist perspective in which the relative vulnerability and resilience of the relevant parts of a particular social organization are used to understand the effects of hazards. Perhaps one of the earliest and most often used definitions of disasters written from this perspective is by Charles Fritz (1961): “an event, concentrated in time and space, in which a society, or a relatively self-sufficient subdivision of a society, undergoes severe danger and incurs... losses to its members and physical appurtenances....” Somewhat similar is the more recent definition used by the Centers for Disease Control to the effect that a “disaster is an ecological disruption causing human, material, or environmental losses that exceed the ability of the affected community to cope using its own resources, often calling for outside assistance.” The other type is a conflict perspective on disasters in which the vulnerabilities plaguing societies are said to reflect chronic and long standing unequal social power and the accumulations of risks

which make disasters inevitable (for a somewhat similar, political-ecological perspective, see Oliver Smith, 2004). Social disorganization, corruption, poverty, and other sundry problems and lack of resources of societies are often understood as the real disasters; hazards and other events precipitating disasters are instead seen as only the catalysts, one numbering among other causes of attendant human suffering. Thus, Blaikie et al. (1994) provide in their “pressure model” an elaborate example of a definition of the probabilities of the risk of disaster as a function of vulnerabilities and hazards ( $R=V+H$ ), in which vulnerabilities originate from: 1. Root causes (limited access to power, structures and resources) and ideologies; 2. Various social lacks (of investments, markets, freedoms, skills and training); and 3. Unsafe conditions (fragile physical environment, local economies, lack of disaster programs, presence of endemic diseases and groups at risk), that interact with hazards (earthquakes, high winds, floods, volcanic eruptions, landslides, drought, pests) to generate the risk of disasters.

Both functionalist and conflict orientations often privilege the community or a similarly bounded ecological area as the social organization impacted by disasters. Both agree with Quarantelli’s (1987) and Dynes’ (1998) widely accepted understanding of disasters as social rather than religious or geophysical occasions. Most functionalist definitions of disasters can be reconciled with Quarantelli’s (1987; 1998), in which they are understood as threats to community values; are relatively sudden, abrupt, unexpected, and demand immediate corrective actions; and differ in significant ways from accidents, emergencies, complex emergencies, famines, epidemics, and droughts. The focus is not on the hazard but on the social consequences of the hazard. While this type of functional definition is widely employed by governments and other organizations to organize their response to traditional hazards, neither it nor the conflict-oriented definitions can be entirely reconciled with the characteristics of burgeoning new hazards and disasters, which have amorphous time and space coordinates, subtle and hardly perceptible modes of initiation, cannot be easily distinguished in terms of their relative seriousness, and are typically large scale complex events that impact simultaneously multiple value systems.

#### *The New Hazards*

Some of the newer hazards that are most relevant to hospitals—terrorism events such as bio-terrorism or cyber-terrorism, or epidemics—involve multiple levels of geography, often including the region, state, and national and international units of aggregation. They do not occur in a place but in multiple places simultaneously, so that their spatial dimensions are often difficult to identify (Macgill, 1986). The concept of community is less relevant to make sense of these hazards. Unfortunately, examples of these new hazards and the disasters they create are plentiful. The Chernobyl nuclear accident in 1986 is perhaps the most striking in terms of the indeterminacy of its spatial and long-term effects, with predictions ranging from 200 to 500,000 deaths over a 75 year period, of which an unknown proportion of them will occur outside Ukraine in nearby countries, especially in Byelorussia (Knight). Another example is computer viruses propagated through the Internet. They originate in the intersections of the science, technology and communication systems. The very efforts to create safe systems and increase redundancy in computer systems constitute the conditions used by virus code writers. They may combine with other manmade and natural hazards to create complex

emergencies. The effects of the viruses are felt at a distance from the original source of the problem; are multiple; diffuse over space and time and functional systems, going beyond established political boundaries; and have no obvious origin and destination and beginning and end states. Often it is not possible to identify what organization, government, or individual is responsible for the viruses and the crises they create. Established phases of disasters (mitigation, preparedness, response, and recovery) do not work very well as frameworks to organize the societal response. Rather than communities, computer viruses impact complexes of national and international level institutions such as banking, trade, and communication. Cyber terrorism, distinguished from hacking by its more explicit political aims, presents similar challenges of scope for developing frameworks for understanding.

Others have noticed these changes in the nature of the new hazards (Kreimer, 1990, p. 3). More recently, Rubin (1998) writes that the new hazards exacerbate the effects of technological hazards; some may involve larger, more serious weather and other events; are often caused by human error and intentional foul play as in the use of weapons of mass destruction; and generate a feeling of lack of confidence in the relevant facilities and systems of the society. Lichterman (1999) adds that the scale of effects of the new hazards is larger since they are part and parcel of the increasing complexity of the society and its built environment. New hazards can be understood using the established conceptual dimensions of hazards outlined by Burton, Kates, and White (1978, 22-32): they tend to be infrequent, rare; have long durations; widespread effects; slow speed of onset; diffused spatial dispersion; and irregular or random temporal spacing. Illustrative is Patrick Lagadec's work on crises, which he characterizes as processes of extreme turbulence in which existing management practices and operational mechanisms become ineffective, challenging the very logic and the larger political and strategic purpose of the system in which they occur (Lagadec, 1985, p. 11). His work on the 2003 Sudden Acute Respiratory Syndrome (SARS) outbreak illustrates these ideas, for during this epidemic there was a great deal of confusion regarding the seriousness of the threat and the relative effectiveness of public health policies that were put in place in more than two dozen countries to control the epidemic, all done under the scrutiny of world-wide mass media coverage.

Coping with new hazards will demand modifications in conventional thinking about disaster planning and management. In particular, the evolution of emergency management in the United States has emphasized the local community. This emphasis developed because of three factors (See Haddow and Bullock, 2003 for a historical overview of emergency management). First, the local emphasis was critical as part of a reaction in the post World War II preoccupation with national defense and the more local concerns of community emergency managers. Second are the community emergency managers' traditional concerns, centered on "natural" hazards which were generally geographically located. Third, the local preoccupation with natural hazards was reinforced by the U.S. political system where representation is geographically based. The federal role was defined as assisting local communities. However, what we have identified as new hazards is not locally based, either in terms of their "causation" or in terms of a realistic response. There are sufficient differences that make aspects of present-day local planning irrelevant to the management of new hazards. There are also other aspects that need to be

enhanced to deal with the unique dimensions of the new hazards. In general, the new hazards create ruptures in social systems that transcend geographical space.

#### *Modifications to Conventional Disaster Planning Thought*

To deal with the new hazards, certain aspects of conventional emergency planning need to be emphasized and others de-emphasized. For example, much community disaster planning is intended to produce a standard paper plan. Consequently there is often an effort to build a model plan that can be franchised to other communities. New hazards present new contingencies that place the emphasis on managing new and unfamiliar situations. In sociological terms, new hazards create more social and cultural emergence. New situations create new structures. For example, the collapse of Building #7 in New York's World Trade Center on September 11, 2001 destroyed the state-of-the-art Emergency Operations Center. Prior plans never contemplated such a situation, but the response was done in ways not previously considered in prior planning (See Kendra and Wachtendorf, 2003; Wachtendorf, 2004). Hence a higher priority should be given to emphasize creative managing rather than standardized and usually rigid paper plans. In addition, certain aspects of traditional emergency planning would deserve less attention in dealing with new hazards. For example, preoccupation with evacuation is merited with geographically based hazards but is not particularly relevant with some of the new hazards. On the other hand, attention to the media may be much more important, not in the sense of conventional warning but in the sense of defining the problem. New hazards often do not create obvious damage either in a structural sense or in terms of obvious health consequences. One of the issues of a threat with diffuse consequences is in defining the limits of the threat through public information. Too, the importance of public information is enhanced in periods when there is preoccupation with terrorism and there is a strong tendency toward secrecy justified in the name of national security. In addition, the importance of extra community networks is enhanced with new hazards, not in the context of creating expectations for massive external assistance but in the ability to enhance local knowledge by importing other perspectives.

In this paper we examine hospitals and their approach to disaster mitigation, for while they have so far become involved mostly with traditional disasters, and while they do not practice all elements of planning that would be necessary to respond to the new hazards, they nevertheless provide an example of the dynamic planning that is needed, planning which facilitates changes in the structures of the social organizations at risk and that bring about increases in resilience, done in a multiplicity of zones of interdependence of systems of response that go beyond the boundaries of the community and which reflect a culture of mindfulness.

#### *Defining Institutions*

The new hazards demand a unit of analysis other than the community level, even if one conceives of community broadly. These hazards render the community less relevant as a locus of disaster analyses and programs. We propose the broader concept of institution, for it subsumes it and goes beyond it. The focus on institution in the social science study of disasters owes much to Stallings (1998a; 1998b) who argues that the more inclusive concept of institutions, such as "the political, economic, religious, scientific, educational, and familial spheres in a given society" (1998b: 223) would provide the more theoretically

appropriate locus. Although he does not explore what makes institutions more or less open to disruptions (see below), Stallings writes that all institutions have routines, that change in institutions is ubiquitous, and that disasters can be understood as types of disruptions of the routines of institutions that in turn produce adaptations, what he calls exception routines, that over time become routine. In this paper we explore the implications of this view of disasters as institutional disruptions, for it accounts for some unique features of the new hazards and disasters such as their ambiguous spatial and temporal features, and it allows us to differentiate institutions in terms of their levels of vulnerability and resilience and their cultural practices that mitigate the impact of disasters.

According to Scott (2001) there are three main approaches to institutional analysis, the “cultured-cognitive, normative, and regulative” which, “together with associated activities and resources, provide stability and meaning to social life”. (48). The regulative view of institutions includes an emphasis on symbols embodied in rules and laws; on relations of power and governance; on the routines of protocols and standard operating procedures; and on the production of artifacts that satisfy desired specifications. The normative view emphasizes symbolic dimensions of values and expectations; relations in systems of authority; routines embodied in job descriptions and obedience to duty; and on objects satisfying conventions. Finally, the cultural cognitive view emphasizes, at the symbolic level, interpretative schemata; relations of isomorphism and identities; routines embodied in scripts; and artifacts with symbolic value (77). Zoltan’s (1998: 47) definition of institutions includes all three: they are abstract social objects that a) include norms and rules for social action, built of “various combinations of preferences, ideals, values, norms, and rules,” b) have consequences, influencing what people believe and decide to do, and c) are the product of both design and broad interest group preferences.

Each of these approaches to institutions when used to understand disasters generates different insights. Perhaps the most commonly used in studies of disasters is the regulative, in which organizations are treated as unproblematic facts (Haddow and Bullock, 2003; O’Rourke, Lembo, and Nozick, ND). Most social science studies of disasters use normative approaches to institutions, as reflected in Stallings’ emphasis on routines and their disruptions. Studies of socio-cultural emergence in the aftermath of the September 11 World Trade Center disaster also come to mind, in which existing social organizations were found incapable of handling the demands generated by the occasion and new inter-organizational networks of norms and practices came into being to organize the response (Kendra, Wachtendorf, and Quarantelli, 2003). By way of contrast, the least used approach is the cultural cognitive, which assesses the institutional values and norms providing interpretive scripts followed by people and organizations faced with hazards and disasters, the rhetorical contexts in which debate about hazards and risks is structured, and the semiotic codes that provide explanations and justification to lines of social action (Swidler, 1986; Wolf, 1975).

#### *Vulnerability and Resilience of Institutions*

Not all institutions are equally relevant for mitigating disasters or for understanding resilience more generally. Instead, we would like to suggest that there are a limited number of disaster relevant institutions. Seventeen of the most relevant of these are: Family; Religion; Politics; Economy; Medicine and health; Education; Scientific research; Law and

the courts; Risk management, which includes the police, firefighting, and other response instrumentalities of the state and civil society<sup>1</sup>; Mass media and communication; Transportation; Energy; Food; Water; Leisure and entertainment; Construction and other built environment activities; and Land use and environmental regulation and protection. These institutions are made up to varying degrees of institutionalized and emergent social organizations that form a web of crosscutting social organizations and associated collective behaviors. Some of the most important of these forms of social organizations are groups, networks, social classes, complex organizations, communities, and the web of political instrumentalities of the state, to include law and the courts. Emergent forms of social organizations or collective behavior forms constituting them include crowd and mass behavior, ecstatic and hostile outbursts, public opinion, cults, and social movement organizations.

The different conceptual emphases on institutions identified by Scott could be used to study the vulnerability and resilience of these institutions along the lines indicated by Anderson and Woodrow (1989; see also Davis, 2004), who study them in three domains: the physical and material bases of social life; in social organization; and in the motivational/attitudinal sphere (public opinion). Within each of these three levels, they examine the effects of gender, race and ethnicity, social class, and time. This six-variable scheme, or a similar approach, could be used to clarify specific matters related to the vulnerability and resilience of the social organizations in the various institutions. For example, analysis of the relative vulnerability and resilience of the transportation system of a region could combine both a regulative and a normative theoretical framework, in which the first could be used to describe it and the second to examine the norms that govern its operations and provide the foundations for social action during emergencies (Scott, 2001).

Institutions are complex entities and some parts are more important than others in examining the problems generated by disasters. Dimensions of what have come to be called “high reliability organizations” (HROs) are central to the effectiveness of most institutional areas. Analysis of these dimensions can provide guidance in the examination of the factors that create vulnerability and resilience in these institutions. Some of the most important characteristics of HROs are that they are stressful, fast paced settings nowadays operating at near full capacity. as Gardner (2001) observed; are closely monitored by regulatory agencies (Mallak 1998); perform sensitive processes and complex technical operations; use professional knowledge and procedures; emphasize safety and absence of errors during operation; minimize vulnerability through constant training (Weick, Sutcliffe, Obstfeld, 1999, p. 83-84; Weick, 1987); practice redundancy, constant improvement and planning and programming, and demonstrate a collective mindfulness of potential troubles (Roberts, 1990; Rochlin et al., 1987; La Porte, 1996). Moreover, they have a dominant rhetorical justification for their actions, a commitment to a common purpose that is normative and is collectively held by everyone in the organization (Comfort, 1999).

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<sup>1</sup>The comprehensive examination of the vulnerabilities and resilience of the social organizations in these institutional sectors is too broad a task to carry out in this paper. Information about the risk management sector is found in Drabek, 1991, 10; Kreps, 1990; Schroeder, Wamsley and Ward, 2001; Popkin, 1990; Roberts, 2004.

HROs are bureaucracies suffused with a military or semi-military ethos such as nuclear plants and aircraft carriers, and it can be argued that their experiences are irrelevant to understanding how other civilian organizations respond to disasters and crises. Like Weick et al (1999), we do not believe that this is the case, but rather, that despite their distinctiveness, it is useful to ask if some of their key characteristics could be used to minimize vulnerability and enhance the relative resilience of social organizations that do not have structures of central command and control. We turn next to the case of hospitals. These social systems evince many of the characteristics of High Reliability Organizations, in particular such characteristics as pre-vision, prevention, the awareness of risks and the willingness to modify current practices and institutionalize new ones to anticipate or even eliminate future problems and crises.

*An Example from the Institution of Medicine and health*

The relevance of HRO characteristics to the understanding of vulnerability and resilience of institutions to disasters is shown in a recent study of hospitals. It involved carrying out 13 focus groups in acute-care hospital organizations between April 2000 and October 2001 as part of a hospital seismic mitigation study in California, Tennessee, and New York (full report available from the Disaster Research Center. See Mallak (1998) for a different approach to resilience in hospitals, focusing more on the individual level). We wanted to find out what usually happens in hospitals when they respond to sudden changes in demands for resources, and how these changes become part of the very structure of these complex organizations. Not all aspects of hospitals are involved in our discussion; we are interested in the infrastructural systems of the hospital that are involved in crisis/disaster planning rather than in the clinical systems where the surgeons and other medical staff treat patients. Hospitals are amalgams of systems and our research focuses on those systems needed to maintain the functionality of the institution.

The population of hospitals comes from the American Hospital Association's (AHA) Guide to the Health Care Field, an annual directory of hospitals and health-related organizations in the United States. Included in the study are hospitals in three regions of the United States facing different levels of seismic risk that are acute-care facilities with emergency rooms or trauma centers. Hospitals were also selected in terms of their sizes as measured by the number of beds, and different types of ownership (government-owned and operated facilities, for-profit organizations, and nonproprietary, not-for-profit organizations). Moreover, they had to have facilities in major metropolitan cities and in smaller cities in the same counties, which allowed us to study the impact of city ordinances and building codes on hospital mitigation measures as well as the effect that hospital networks and health care associations have on risk perception and preparedness. Twenty-nine health care facilities satisfied these selection criteria and were asked to participate in the study. Thirteen participated, so that the findings of this study are unrepresentative of the population of hospitals in the three regions and in need of replication. The focus groups included 76 respondents and at least one representative from each of the following four groups of staff dealing with crises and disasters: hospital administration, physicians, nursing, and engineers; most were active members of their hospitals' safety committees and had been involved in safety issues and crisis preparedness policies. The

generalizations presented in this section of the paper are based on a more extensive analysis of qualitative material obtained from the focus groups.

Our findings show that hospitals have some of the characteristics of HROs, reflected in their concerns for the socio-technical safety, planning, and engineering of their physical plants. They have safety committees that not only develop policies and programs but also participate in the constant evaluation of systems. In a typical pattern, an event takes place or a problem is identified of relevance to the safety of the organization. A task force composed of representatives from a number of departments is formed to study it and report their conclusions to the larger committee. The committees involve administrators and other staff with many different concerns and expertise, so that there is the opportunity to discuss the things that need to be fixed. Hospitals constantly check for the reliability of mechanical and electrical systems and ensure redundancy in all of the utilities and other key dimensions of their physical plants. Their programs, planning and training are geared to solve crises before they happen or to respond expeditiously to those that do happen. Resilience is often engineered into the design of the physical plants themselves and also comes about through the provision of linkages to systems outside the physical plants that can be deployed quickly to provide emergency supplies. Availability of resources thus becomes an example of latent redundancy (Kendra and Wachtendorf, 2003). It is not that all present and future problems are fixed in the hospitals we surveyed, but that there is among hospital managers and administrators a stance of vigilance and a constant mindfulness of the potential weaknesses of their critical systems and the need to provide alternatives if they were to fail. There is also a questioning of existing arrangements, and the fear that what exists is not good enough. A recurrent fear is that hospital staffs do not know what they are supposed to do at time of crises, and that many employees forget the meaning of various disaster codes and what they are supposed to do if they are activated. Not only is there constant monitoring and feedback in the hospitals in the study, but there is also the enactment of corrective measures when needed. For example, in one of the hospitals there is the sense that their in-house emergency water supply is insufficient, paired with ongoing efforts to arrange solutions with two organizations outside the hospital, the National Guard and the local brewery.

Internal emergencies and crises in hospitals that precipitate the invocation of the disaster plan also come about from their interdependence with other health service organizations. This is one of the Janus-like qualities of hospitals: they are highly autonomous and self-referential yet they are also very much parts of inter-organizational systems; they change and orient their actions to accommodate the demands of these systems of cooperating agencies. One hospital typifies this context quite well,

“We are one of the general hospitals in the region and we coordinate through the fire department...we are part of the municipal hospital system...in a major disaster the city’s disaster management office would either contact us directly, or, more likely contact health and hospital central office directly which would then reach out to the individual command centers. So there is an incident command system of local government agencies that reaches out to the hospital association and then it filters down to us. We are not a trauma center, so we would actually get less critical cases depending on the nature of the

event; part of our big role is to support our network partner and take the more minor cases that we can handle and let them as a trauma center get some of the critical cases.”

The importance of these systemic linkages of hospitals to other community and regional organizations, particularly health service organizations, is that it is often the way in which emergencies and crises are created in hospitals and solutions to emergencies and crises found for hospitals. The experience of two hospitals illustrate the crisis-creation process,

“One episode that happened three years ago was the unexpected closing within a day of the nursing home. They had several hundred patients and they all came here. They closed and soon after we had... twenty or thirty patients. Suddenly we were told, “you’re getting this amount of patients.” It was really a limited emergency situation, for we had to attend to the very specific needs of those patients.” They add: “...it was a real bad ice storm. The roof of the nursing home fell in, and they had to evacuate the nursing home patients and bring them here. I think there were 70 to a hundred patients that night.”

The experience of another hospital illustrates the crisis-solution process, “We have a partnership, letters of agreement, with six or seven nursing homes in the community, so that if we need to discharge people out we can get them [patients] out to them [nursing homes] to make vacancies available for us, and if they have a situation, they can ship them to us.”<sup>4</sup>

At times the potential demands generated by the system never materialize. Nevertheless, system-originated emergencies and crisis in hospitals that create disaster conditions may take place purely on anticipatory grounds as a result of the hospital’s connectedness with other hospitals and community organizations. The 9/11 WTC attack illustrates this point:

“The last activation of the disaster plan was actually September 11th. It was a decision that was made by our network partner, based on TV and the knowledge that the buildings had collapsed. The anticipation was that we would get many patients. In the end, we didn’t have that great an influx of patients. They only transferred eleven patients who were waiting for ICU beds so that their ICU would be available to the critical cases that were assumed to be coming from the WTC. So immediately, literally within thirty minutes, disaster plans were underway for transferring patients out of their emergency department to our emergency department, and our disaster plan was activated so additional equipment and staff were brought in or notified. For the World Trade Center incident, we actually set up a secondary triage area on the second floor in our ambulatory care area in the medicine department, in the event that there was an overflow from the emergency room. It was done anticipating that the patient flow would overwhelm us. (Instead), during the WTC incident we had a tremendous influx of people coming in for mental health intervention; they needed somebody to talk to about the situation.”

### *Emergencies, Crises, and Disasters*

Hospitals' characteristics of safety, preparedness, and mitigation measures—anticipation of trouble, vigilance, redundancy, feedback and correction—in their totality represent an important set of cognitions. These cognitions bring about organizational adjustment in hospitals that has important implications for the way emergencies, crises and disasters in hospitals are understood and incorporated into programs. The different requirements generated by these three types of disruptions eventually become routine programs and practices in hospitals that are then applied to a whole range of occasions, thus blurring the distinctions among them. This process of collective learning means that operationally hospitals do not differentiate among emergencies, crises, and disasters. Instead, hospital staff uses subjective criteria to make sense of these occasions and respond to them.

Disasters in hospitals do not have to occur to become the subject of intense planning and programming: future crises and disasters, either more or less similar to previous occasions, or never-before experienced but anticipated occasions, become part of the imagined reality of hospital staff, are considered as having the potential to occur and disrupt the functionality of the hospital, and anticipatory planning and corrective actions take place to respond to them. The planning and mitigation that take place are part of a general culture of mindfulness, a deep-seated awareness that emergencies and accidents are always lurking under the appearance of utter normality, so that disasters, either occurring or imagined, are used by hospital staff as signals of impending trouble which demand their response (Slovic, 2000; Renn et al., 1992), in what Kates (1985) refers to as the “institutionalization of hazards management.” In the words of one of our respondents, “There’s always the unexpected. It is just a scary thought, because you never know what you’re going to run into, and what you thought was going to work doesn’t work. But as far as actually looking at it and being prepared I would guess we are doing that.” Hospitals try to incorporate the imagined or real demands generated by these occasions in their emergency and safety programs, and the overall process and systemic feedback relationships that exist among emergencies, crises, disasters, and institutional strengthening in hospitals can be understood as the routinization (Stallings, 1998) of these processes in these hospitals, resulting in the increased resilience and reliability of these complex organizations.

The invocation of the disaster plan and the increase in the level of response associated with disasters in the hospitals are a function of the hospital staff’s perception of the actual and/or potential impact of hazards and/or other occasions on their organizations; the likely effects of these occasions and conditions on the hospital’s ability to continue to take care of its patients optimally—the primary value and rhetoric justifying all other institutional processes; the extent to which staff had confidence in its predictions; the availability of staff, equipment, supplies, and other resources; and the hospitals’ degree of preparedness and planning for these occasions. These decisions are suffused with uncertainty, so that what to call an occasion—whether an emergency, a crisis, or a disaster—is a negotiated outcome, a social construction. It is not always possible to predict how incidents with given sets of characteristics will be understood; similar incidents are defined as emergencies, crises, or disasters, depending on the social processes previously identified.

### *Challenges to Hospital Functionality*

Challenges to the functionality of hospitals are of two broad types: supply disruptions, or the loss or diminution of resources needed for the organization to function as an organization, and demand disruptions, or an increase in patients, actual or anticipated, in excess of existing capacity; the invocation of the disaster plan is a complex outcome of these two processes (compare to Haas and Drabek, 1970; Mileti, Drabek and Haas, 1975). Hospitals are seldom the victims of disasters because the simultaneous occurrence of both types of supply and demand disruptions is rare. A crisis may occur in a hospital that is not noticed in the community. Similarly, disasters occur in communities that are not disasters for hospitals. The claim that a disastrous occasion is taking place most often comes from outside the institution of the hospital, but the response to that claim is very much dictated by processes internal to the hospital. There is no necessary correspondence between hospital and community claims. The distinction between the two types of claims is amplified by the relative autonomy of hospitals and their emphasis on reliability as well as by the fact that, contrary to some other complex organizations, hospitals are in the business of providing normal responses to extraordinary occasions, absorbing abnormal occasions and processing them to try to alleviate and improve people's health.

What constitutes disasters for the hospitals in our study is not only or primarily what individual staff members define as disasters, as some social constructionist views would advance, for an individual's claim-making occurs in the context of collective assessments guided by bureaucratic understandings and procedures of the technical capacities of hospitals to handle the demands brought about by various occasions. Thus, in the aftermath of the 9/11 World Trade Center terrorist attack most hospital staffers in the New York and New Jersey areas would have referred to this occasion as a disaster, which it was for the lower Manhattan area, although it was not for the hospitals in the region, for the occasion did not challenge the established emergency response system of New York and New Jersey hospitals. The WTC terrorist attack did not impact hospitals directly; the acute stage of the crisis had a beginning and an end; its geographical location was well understood; it required the enactment of existing hospital procedures; the type of trauma and injury from occasions of its type is part of standard medical practice and training; its likely demands on the regional system of hospitals could be handled. The occasion did not bring about a break with established arrangements (Stallings, 1968; 1970; Quarantelli, 1970). Rather, the WTC occasion was more like a large emergency or accident for these hospitals. Contrast the type of demands that the 9/11 attack created for local hospitals to a deadly pandemic produced by unknown biological agents for which treatment and therapy are not well established in medical practice, impacting the population of a whole region or the entire country and among them the staff of hospitals and their families, for which it is very uncertain how it began or will end. This type of terrorist attack would have created much more serious challenges to hospitals. We do not wish to deny the appropriateness of people's perceptions but instead would emphasize how and to what extent they are relevant for specific analytical purposes.

Hospitals' responses to various disruptions highlight how disasters are socially constructed within an organizational logic, as a set of social occasions distinct from the

magnitude of impact of a particular hazard, along a continuum of increasing severity and inability of providing care. The size and nature of the hazard are largely ignored. Second, it shows that the stability of their system is understood relative to their ability to interact with other groups—patients, for example—which is a continuously varying thing that can never be known entirely in advance. In this sense hospitals are never free of disasters for they cannot define what is normal. Instead, they are always in pre-disaster mode: a sudden surge of patients, an earthquake, a power failure, a staff shortage can happen anytime and simultaneously. Hospital staffs' attempts at improving the resilience of their organizations are always incomplete, in process as it were.

It is useful to emphasize that the study of hospitals and their relationship to disasters suggests the value of regulative, normative and phenomenological conceptualizations of disasters. The rules and programs that a regulative approach would emphasize in such a study become alive, as it were, once the normative understanding of these events, the dynamic nature of social life in hospitals, is clarified. Similarly, a regulative and normative understanding of hospitals in disasters helps in delimiting the phenomenological view of disaster in hospitals, for institutions can be understood more broadly than the logic of inter-subjective meaning construction.

#### *Conclusion*

From the foregoing it is appropriate to deduce that the occurrence of disasters and new hazards as a type of disruptive social occasion depends in part on the characteristics of the social organizations impacted by the hazards, and that social organizations that incorporate characteristics of HRO are much more capable of handling them. Important characteristics of HRO are their mindfulness, their vigilance and anticipation of trouble, their training and social arrangements, and their incorporation of the resulting learning into their structure, which minimizes over time the effects of future hazards. As is the case for hospitals, learning, prevention, and associated structural transformation could become part of other social organizations of other institutions such as schools, churches, businesses and corporations, increasing their resilience to disasters and to the new hazards. As the hospital example shows, the pursuit of these values does not require the adoption of a military approach to social organization and can be made part of social change within a democratic tradition. What they require, as Mileti (1999; see also Lagadec, 1993, chapter 11) pointed out in another context, is a change in culture. That such learning can take place rather quickly is illustrated by the recent response of Pepco Holdings, Inc. (PHI), the parent company of Pepco and Conectiv, to the massive power outages created by Hurricane Isabel (details available from <http://www.wittassociates.com/1163.xml>), which includes a serious effort by the corporation to include the communities in decisions regarding the setting of priorities in the restoration of power; increasing the sharing of information; and much greater planning, exercises, and coordination with local emergency services and public works agencies.

Extreme complexity and interdependence and near simultaneous connectivity among the institutions of modern society are their most distinguishing features (Granot, 1998). Lagadec (2003, p. 3) puts it thus: "The delicate and increasingly central problem (is) the management of large systems in situations of high instability, marked by ignorance, impulsive behavior, speed and irreversibility: our technical knowledge, adapted to

relatively familiar and stable situations and compartmentalized worlds, is not up to the task when confronted with 21<sup>st</sup> century crises.” This institutional complexity increasingly serves as backdrop to the potential new disasters of the 21<sup>st</sup> century. It requires us to rethink disaster planning as a comprehensive response to risks involving inter-unit cooperation in times of crises occurring in multiple places. As in the case of hospitals, all disaster planning should be guided by the goal of increasing the mindfulness, pre-vision, and structural transformation of social organizations. It is a process not an end state. As the example of hospitals shows, it is simultaneously an external and an internal process of social change. Hospitals are not only engaged in a constant process of reinventing themselves as they pursue resilience and a minimization of vulnerabilities in times of crises, but are also embedded in planned networks of dynamic relations with other hospitals, regulatory institutions, and other public health organizations. Their disaster planning includes strengthening their internal capabilities as well as the exchanges of resources and coordinative efforts with other hospitals and organizations. Something similar would need to be adopted in the other institutions in the society. It is not the community in which they reside but the system in which they are embedded that becomes the locus of planning. Planning has both an inward and an outward focus, and it is not only a matter of planning for response but of the creation of a new culture of mindfulness. Not to do so will assure the repetition of response failures such as the *Exxon Valdez*'s (Harrald, Cohn and Wallace, 1992) or of accidents as in the cases of the space shuttle *Challenger* or of Three Mile Island.

The requirements imposed by the new hazards and the disasters they cause make more poignant Dynes' (1994; see also Kartez, 1984) criticisms of the prevailing command and control framework used to organize community emergency planning in the United States as well as the alternative values of continuity, coordination, and cooperation as more effective principles for disaster planning. This is the case since as we have argued the new emergencies are often not very easy to recognize, are slow to develop, involve social systems at multiple levels of geography, from the community to national and international units, so that authority structures to handle them do not exist and must emerge in part during the response to the crises, a response typified by multi dimensionality of authority, autonomy, and decentralization as illustrated by hospitals. As Dynes advises, “planning efforts should be built around the capacity of social units to make rational and informed decisions... (with a) premium placed on initiative and flexibility.” (149).

An institutional approach to disasters would allow greater insight into the proposition, at the center of Charles Fritz's classic definition, that disasters are produced by risks that create demands that exceed the capacity of social organizations to handle. Not explored by Fritz is the fact that institutions are composites of social organizations that differ in their tendencies to become victims of disasters (or of disruptions in Stallings' term), and in their resilience, or the extent to which they show mindfulness and incorporate hazards' demands into their operations. Thus, they also differ in their capacities, for a hazard that generates a disaster in one institution may not generate it in another. It follows that an institutional view of disasters would allow for a more nuanced understanding of the impact of hazards on society, and for the possibility of a disaster happening in one institutional arena of society but not in the others. This multi-disciplinary effort is still-to-

be done, to advance the study of disasters by studying the nature of institutions and the social organizations in them, how they respond to crises and disasters, and how and to what extent they incorporate disaster demands into their functioning and their structures as they adjust to social change. This paper is intended as a contribution to this dialogue.

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