Hospital Strategic Preparedness Planning: The New Imperative

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Abbreviations:
HVA = Hazard Vulnerability Analysis
NHAMCS = National Hazard Ambulatory Medical Care Survey
SPP = strategic preparedness planning

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Abstract
Strategic preparedness planning is an important new imperative for many hospitals. Strategic preparedness planning goes beyond traditional product/market strategic planning by focusing on disaster prevention, containment, and response roles. Hospitals, because of their unique mission, size, complexity, the types of materials they handle, and the types of patients they encounter, are especially vulnerable to natural and human-initiated disasters. In addition, when disasters occur, hospitals must develop well-conceived first responder (receiver) strategies. This paper argues the case for strategic preparedness planning for hospitals and proposes a process for this relatively new and much needed type of planning.

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Introduction

There has been an increase in the number and severity of disasters throughout the world. For example, there have been 682 reported disasters caused by natural hazards and 306 human-initiated disasters in the United States since 1900. The majority of the natural (73%) and human-initiated (58%) disasters have occurred during the past 25 years.[1] Factors that contribute to this increase include: (1) the increase in population; (2) migration of people to urban areas and consequent increase in population density; (3) location of cities in high risk areas; (4) population mobility; (5) erosion of environmental barriers; (6) changes in climate; (7) economic inequity; (8) development of complex and integrated technologies; (9) global interconnectedness; and (10) the increase in old (cholera, yellow fever, diphtheria, malaria, plague) and the emergence of new (HIV, Ebola, hepatitis C, hantavirus, bird flu) infectious diseases. As a result, many organizations are "at risk" and increasingly, for most hospitals, a new type of strategic planning is required—strategic preparedness planning (SPP). Although similar to traditional product/market-oriented strategic planning, SPP is more focused and addresses the risks and plans for potential disasters and response roles.

There has been preparedness planning at the community, regional, and national levels, and there are numerous preparedness planning guidelines[2–8] and principles[9] that have been developed. However, these preparedness planning guidelines and principles primarily concern community (multiple stakeholders) disaster planning rather than planning specific to the preparedness and survival of individual hospitals.

Because of the unique nature of most hospitals, traditional strategic planning no longer is adequate by itself. This paper suggests that hospitals are both high-risk and high-response organizations and should engage in extensive hospital-specific SPP. For hospitals, a two-tiered strategic planning effort is required—one that focuses on traditional product-market relationships, and one that deals with disaster prevention, incident command, containment, damage control, and emergency response. This paper makes a case for SPP for hospitals and outlines the planning process than can be implemented.

The Strategic Preparedness Planning Imperative for Hospitals

A disaster is a serious situation that results in death, injury, human suffering, and property damage on such a scale that it cannot be managed through routine procedures and with the resources of local governments, and generally necessitates a request for regional, national, or international assistance.[10,11] Sudden-onset disasters typically require an immediate, coordinated, and effective response by multiple public and private sector stakeholders to meet the medical, logistical, and emotional needs of affected populations. Disasters may be either nature or human-initiated, and hospitals are most directly and immediately vulnerable to them. Nature-initiated disasters include epidemics and pandemics, floods, volcanic eruptions and earthquakes, wind storms, landslides, and wave surges. Human-initiated disasters, such as terrorist attacks, might be radiological, chemical, biological, or explosive in nature.

A recent study evaluated the preparedness level of 11 hospitals for a terrorist event ("dirty bomb").[12] Researchers found that hospitals were not adequately prepared to respond and manage a mass-casualty event such as an explosion with radiological contamination. Klein *et al* found similar results when they examined the response of hospitals to a 2003 blackout, which affected eight states and parts of Canada. Researchers found that hospitals were inadequately prepared to respond to and manage this crisis. In the study, hospitals encountered problems with staffing, ventilation, generators, elevators, computers, and other operational and medical breakdowns.[13] Despite these findings, a 2003 National Hospital Ambulatory Medical Care Survey (NHAMCS) of 500 non-federal and short-stay hospitals in the US suggests that 97% of hospitals have plans for responses to a disaster caused by natural hazards, 85% have plans for chemical and biological disasters, and 77% have plans for nuclear, radiological, and explosive disasters.[14] However, these plans tend to be hazard-specific, and did not represent systematic disaster risk assessment and planning. In addition, data from the Bioterrorism and Mass Casualty Supplement to the 2003 and 2004 NHAMCS examined hospital characteristics associated with terrorism preparedness training. Of the 739 US hospitals analyzed, hospitals accredited by the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO), with teaching status or medical school affiliation, bed capacity, and location in urban areas were more likely to provide preparedness training to staff than hospitals without these characteristics.[15]

It is only through a SPP process that hospitals can create a realistic plan that will minimize disaster exposure and maximize disaster response. Further, there must be a specific process or mechanism for considering "the worst case scenario". Strategic preparedness planning is that process, and SPP provides the structure to consider issues and reach consensus on how the hospital should proceed. Having a periodic structured process initiates a reconsideration, discussion, and documentation of all assumptions and evidence. Without a planned process, hospital administrators may have difficulty implementing SPP. Without a process, ideas never are discussed, conclusions never are reached, decisions are never made, strategies are not adopted, and strategic thinking is not documented.

Strategic Planning versus Strategic Preparedness Planning

Dealing with rapid, complex, and often discontinuous change requires systematic traditional strategic planning. Successful hospitals have leaders who understand the nature and implications of external change, the ability to develop effective strategies that account for change, and the will and ability to actively manage the momentum of the hospital. These activities collectively are referred to as "strategic planning". Traditional strategic planning provides the momentum for change.

In contrast to strategic planning, SPP specifically deals with the identification, prevention, containment, and damage minimization of a disaster. Strategic preparedness planning has a different focus than traditional strategic planning that is oriented to matching products to markets and creating competitive advantage. The differences in traditional strategic planning and SPP are compared in Table 1.

Because of the dramatic increase in disasters, preparedness issues can no longer be an "afterthought" of strategic planning or a brief "add on". The realities of the 21st century suggest that a separate process of strategic preparedness planning must be adopted by high-risk organizations and those with response roles.

The Unique Nature of Health Care Strategic Preparedness Planning

Many different types of organizations must plan for both nature-initiated and human-initiated disasters. Some organizations are at high risk for disasters because of their location, mission or purpose, image or reputation, technology, or materials they handle. Clearly, these organizations must engage in some level of organization-specific strategic preparedness planning. Other organizations, although not necessarily at high risk, have specific roles for responding to disasters should they occur. Factors contributing to an organization's response role include mission or purpose, capabilities, competencies, resources, location, and availability of alternative responders. These organizations specifically must plan and train for high probability and high impact disasters affecting themselves and others. Organizational risk for disasters and organizational response roles are compared in Figure 1.

Organizations are not equally at risk for disasters. For example, risk for nature-initiated disasters may be dependent upon location, building codes, or social conditions. Similarly, an organization may be at particular risk for terrorism because of its technology or the materials handled, image, reputation, mission/purpose, or countries in which it is located. Strategic preparedness planners for hospitals must determine which kinds of nature- and human-initiated disasters are most likely, given their unique circumstances.

Organizations within each quadrant will have different emphasis and scope of strategic preparedness. For example:

1. *Low Risk/Low Response*—These organizations are at little relative risk for disasters and have no response role. Therefore, they require little strategic preparedness planning;

Area	Traditional Strategic Planning	Strategic Preparedness Planning
Orientation	Directed toward defining the organizations relationship to its economic, social, political, technological and competitive environments	Directed toward assessing risk and impact of nature-initiated and human-initiated disasters
Focus	Places strong focus on gaining and sustaining competitive advantage	Focuses on prevention, detection, incident command, and damage control of disasters as well as response roles
Result	Establishes organizational mission and focus	Establishes prevention and response preparedness plans
Principal Concern	Is concerned with markets and products and services	Is concerned with analysis concerning natural, industrial/operational, economic, social/political and terrorism disasters
Strategies	Organizational expansion, contraction and maintenance of scope strategies	Organizational and employee safety and disaster response
Communication	Requires that the strategy be clearly stated and persuasively communicated throughout the organization	Requires that everyone in the organizations understand the nature and risk of disasters and incident command
Benefit	Facilitates consistent decision making for performing work through the organization	Facilitates development of an action plan specifically for disasters
Required Data	Emphasizes data collection and analysis concerning markets, competition, and products/services	Emphasizes data collection and analysis concerning natural, industrial/operational, economic, social/political, and terrorism disasters

Table 1—Traditional strategic planning and strategic preparedness planning

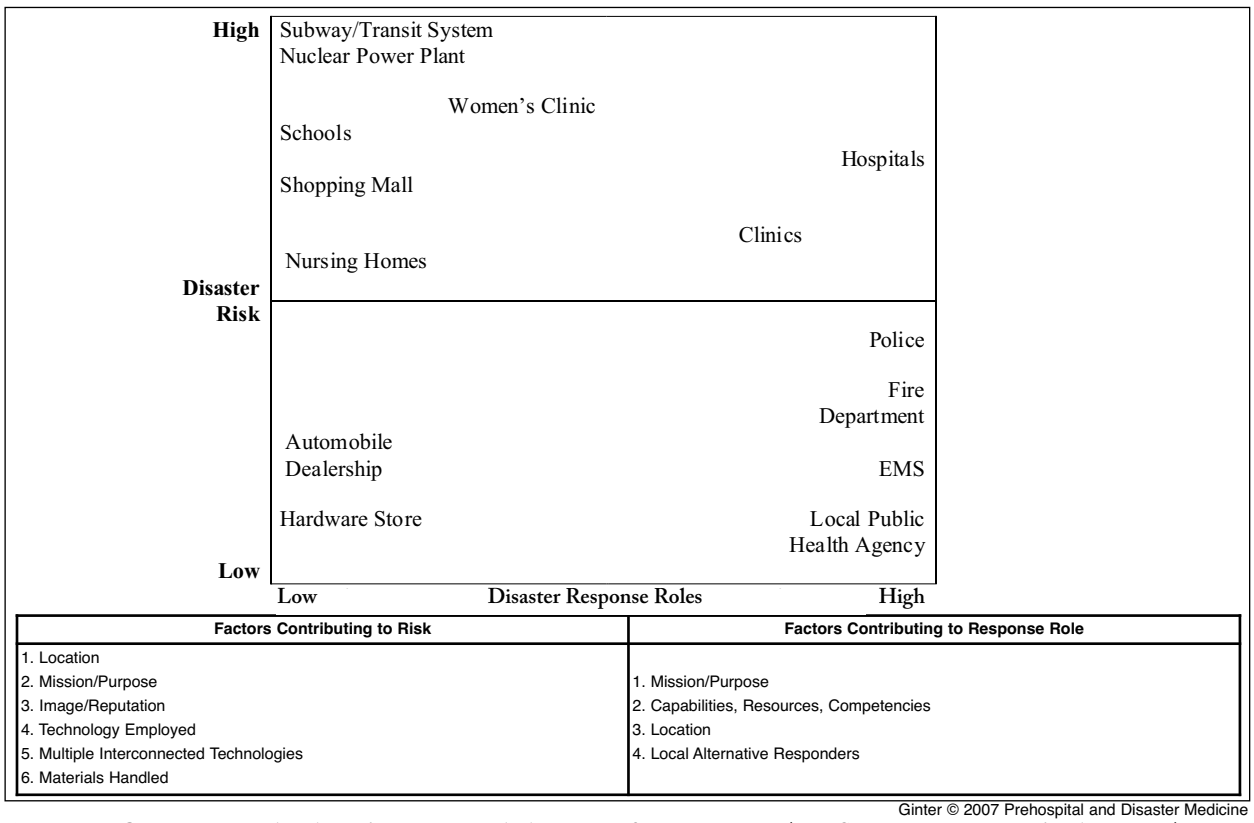


Figure 1—Organizational risk and response role by type of organization (EMS = emergency medical services)

2. *High Risk/Low Response*—These organizations are at high risk for disasters (location, mission, etc.) and should engage in extensive strategic preparedness directed toward prevention, detection, incident command, and damage control;
3. *Low Risk/High Response*—These organizations are at low risk of disasters, but must respond to these events (mission, expertise). These organizations must engage in extensive strategic preparedness directed toward incident command and emergency response; and
4. *High Risk/High Response*—These organizations are both at high risk for disasters and also are organizations that most likely will respond to disasters. These organizations must engage in extensive strategic preparedness planning directed toward prevention, detection, incident command, and damage control, as well as emergency response.

Hospitals occupy a relatively unique position of being relatively high risk as well as having a high response role. Similar to other organizations, hospitals are at high risk for nature-initiated disasters because of location. In addition, hospitals are at considerable risk for terrorism because of their mission/purpose, image, reputation, dangerous materials, and they are people-dense organizations. At the same time, hospitals have significant response roles in disasters (24-hour provider, technology, competencies, mission/purpose). It would appear that hospitals are both high risk and high response organizations and, therefore, strategic preparedness planning is essential.

Process of Strategic Preparedness Planning for Hospitals

One of the greatest challenges for hospitals is identifying the disasters that are most likely to occur, and then planning for these disasters. The introduction of an early recognition system to identify external issues should be a major task for hospital leaders. Therefore, strategic thinking must be directed toward "reading" the many shifts occurring in the external environment and determining which are important to the success or failure of the hospital. Strategic managers, through SPP, must remove the protective covering in which organizations often seal themselves.[16] One particular way to begin the SPP process is to utilize the Hazard Vulnerability Analysis (HVA) tool to assess the threats and the vulnerability of the organization to those threats.[17]

Hazard Vulnerability Analysis is a format for assessing the probability of a threat, risk to the organization, and degree of preparedness by the organization for an event. Through a scoring system, planners can evaluate such factors as known risk, historical data (probability), threat to life and health, disruption of services (risk), status of current plans, and training status (preparedness). In HVA, potential events are listed and divided into three categories—natural events, human events, and technological events.

Goals of Strategic Preparedness Planning for Hospitals

Although the overall intent of strategic preparedness planning is to identify, prevent, and ameliorate disasters directed toward a hospital, more specific goals may be identified. The specific goals of SPP are:

1. To detect and analyze the signals of potential nature-initiated and human-initiated disaster-producing events directed toward the hospital;
2. To speculate on the likely events that might be directed toward the hospital;
3. To develop disaster prevention strategies;
4. To develop disaster damage control strategies; and
5. To develop hospital response strategies.

Strategic preparedness planning attempts to detect weak signals within the external environment that may portend future disasters, and implements mechanisms to reduce or eliminate the probability of disaster occurrence. Sometimes based on little hard data, managers attempt to identify patterns that suggest emerging threats that will be significant. Early identification through such tools as the HVA aids in developing strategy.[17] Further, strategic managers must go beyond what is known and speculate on the nature of potential crises and disasters.

Once potential disasters have been identified, prevention plans must be developed for disasters that can be prevented or where the risk of occurrence can be reduced. In addition, containment and damage control strategies must be in place and training must be carried out before the event. Finally, disaster response roles must be outlined and exercised.

Identifying Potential Crises and Disasters

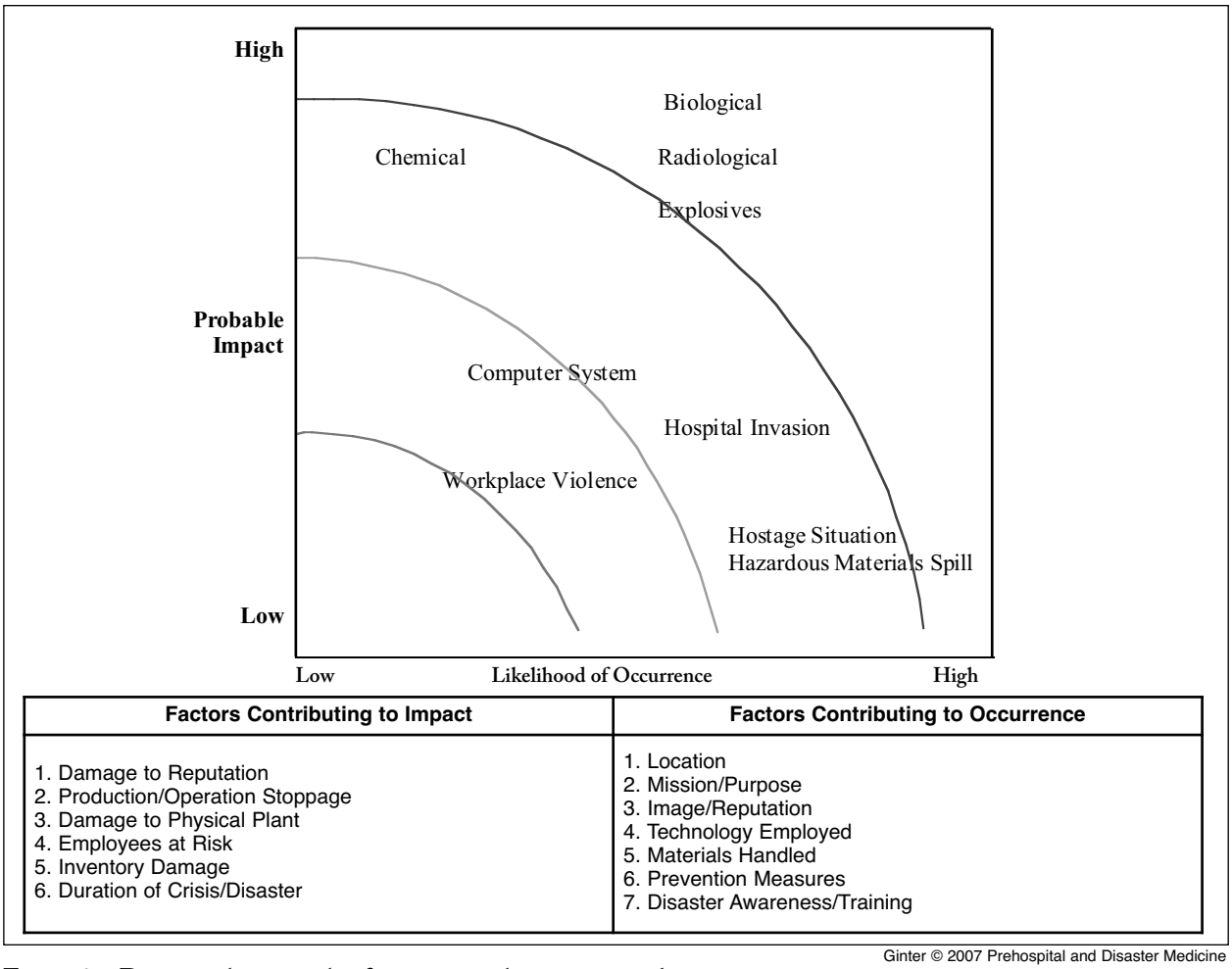
Potential disasters may be identified effectively through a modified environmental analysis process originally proposed by Fahey and Narayanan. Environmental analysis focusing on disasters involves: (1) scanning to identify signals of potential disasters; (2) monitoring disaster risks; (3) forecasting disaster risks; and (4) assessing the organizational implications of potential disasters.[18–20]

Scanning to Identify Potential Disasters

Scanning is a process of examining an organization's environment to detect signals of potential threats—nature initiated and human initiated. The scanning process converts diverse and unorganized data into organized, meaningful information. Prior to this interpretation process, information is diverse, unorganized, sporadic, mixed, and undefined. The scanning process categorizes, organizes, accumulates, and, to some extent, evaluates the risks of potential disasters.

Environmental scanning is perhaps the most important part of disaster identification and analysis because it forms the basis for subsequent processes. For many potential disasters, early signals may be detectable. It is from this beginning that a database for decision-making will be built. It is crucial that hospital administrators understand the thinking that led to the development and selection of strategic and tactical issues from among those identified in the scanning process. Therefore, it is advantageous if as many hospital administrators as possible take part in the scanning process. An important aspect of environmental scanning is that it focuses leaders' attention and allows them to create an organization that can adapt and learn.[22]

Not all disasters are equally likely for any one organization or community. Therefore, strategic preparedness plan-



Factors Contributing to Impact	Factors Contributing to Occurrence
1. Damage to Reputation 2. Production/Operation Stoppage 3. Damage to Physical Plant 4. Employees at Risk 5. Inventory Damage 6. Duration of Crisis/Disaster	1. Location 2. Mission/Purpose 3. Image/Reputation 4. Technology Employed 5. Materials Handled 6. Prevention Measures 7. Disaster Awareness/Training

Figure 2—Disaster planning plot for a potential terrorist attack

ners must assess the probable impact and the likelihood that a disaster may occur. This assessment will focus subsequent planning on those events that have the greatest impact and those most likely to occur. Figure 2 provides an example framework for initial disaster assessment and for thinking through a terrorist threat. Current tools such as HVA have been used widely and are accepted in defining probability and assessing risk, and HVA probability and risk scales may be used to develop graphic representations such as the one shown in Figure 2.[17,21] In the absence of HVA assessments, discussions concerning the factors contributing to impact and factors contributing to occurrence can guide the placement of events.

The two-by-two matrix presented in Figure 2 provides a format for discussing possible disasters. Obviously, for potential events that have a high likelihood of occurrence (such as a hurricane in Florida), preparedness strategies should be developed. However, equally important to consider in preparedness planning, are events with a low likelihood of occurrence, but a high probable impact. Therefore, generally, all events to the right of the right-most arc should receive preparedness attention. Additionally, for discussion purposes, other planning thresholds also may be developed. Commonly:

1. All of the disaster threats that are plotted to the right of the right-most arc should be immediately and explicitly addressed in the strategic preparedness plan;
2. Disasters that are plotted between the middle and right-most arc and have a high likelihood of occurrence should be addressed immediately, while disasters with a low likelihood of occurrence should be addressed over time in the strategic preparedness plan (all of these potential events should be addressed—which is addressed first is a judgment exercised by strategic preparedness planners);
3. Disasters that are plotted between the left-most and middle arc should be addressed over time in the SPP process; and
4. Disasters that are plotted to the left of the left-most arc need not be the subject of review during the SPP process;

Monitoring Disaster Risks

The monitoring function is the tracking of potential disaster events identified in the scanning process. The monitoring function has a much narrower focus than scanning; the

objective is to accumulate a database concerning an identified likely potential disaster. The database will be used to confirm or disconfirm the short-term possibility of an event and to determine the long-term rate of change in risk associated with a potential disaster.

The intensity of monitoring is reflected in management's understanding of the issues. When managers believe they understand the issues well, less monitoring will be done. However, when environmental issues appear ill-structured, vague, or complex, as with most disasters, the issues will require more data to arrive at a plausible conclusion.[23]

Forecasting Disaster Risk

Forecasting disasters is a process of extending the trends, developments, and events that the organization is monitoring. The forecasting function attempts to answer the question, "If these trends continue, or if issues accelerate beyond their present rate, or if this event occurs, what will the disaster "look like" in the future?"

Three processes are involved in the forecasting function:

1. Extending the trends, developments, or occurrences of an event;
2. Identifying the interrelationships among the environment, organization, and potential disasters; and
3. Developing alternative projections.

Assessing Disaster Risks

Strategic issues are often ill-structured, ambiguous, and require interpretation.[23] Information concerning the environment, though abundant, seldom is obvious in its implications. Strategic managers must interpret and intuit the data they receive. After all, facts do not speak for themselves; one has to make sense of the facts, not just get them straight.[24] Assessing the impact of crises and disasters and environmental change is a process that is largely non-quantifiable and, therefore, judgmental.

The assessment process includes evaluation of the significance of the extended (forecasted) disaster scenarios and identification of the issues that must be considered in the strategic preparedness plan. However, the complexity of what is found and the grossness of most of the data collected are not consistent with traditional decision-making methods.[25] There are few procedures for incorporating "fuzzy" issues into the planning process.[26] In addition, even when exposed to identical issues, different managers may interpret their meaning quite differently. Different interpretations are a result of a variety of factors, including perceptions, values, and past experiences.

Unfortunately, no comprehensive conceptual scheme or computer model can be developed to provide a complete assessment of disasters. The assessment process is not an exact science, and sound human judgment and creativity may be bottom-line techniques for a process without much structure. The fundamental challenge is to make sense out of vague, ambiguous, and unconnected data. Analysts must infuse meaning into data; they must make the connections among discordant data such that signals of future events are created. It requires the capacity to suspend beliefs, preconceptions, and judgments that may inhibit connections being made among ambiguous and disconnected data.[18]

Developing Prevention Strategies

First, planning should be directed toward reducing the probability of disaster occurrence. Although planning may reduce or eliminate some threats, total prevention is not a reasonable goal.[9] The probability of nature-initiated disasters may be reduced only by relocation of the hospital. However, relocation may not be possible for some hospitals and would depend upon the prevalence of disaster events. As a result, for many organizations, prevention strategies may focus primarily on containment and damage prevention (i.e., building codes).

Human-initiated disasters may be preventable. In these cases, primary, secondary, and tertiary prevention strategies will reduce the probability and impact of disasters. Primary prevention strategies aim to reduce the occurrence of the disaster by reducing the exposures to causal risk factors of that disaster. In many disaster cases, there are multiple risk factors to minimize. However, through proper training, work designs, and early detection systems, these risk factors can be minimized and even eliminated. For example, cyber or computer system attacks can be greatly minimized and often eliminated if and when the organization develops multi-level security keys and backup and monitoring systems.

Secondary and tertiary prevention strategies aim to reduce the duration and impact of a disaster. Secondary prevention strategies identify and control disasters in development. The goal of secondary strategies is to create policies and procedures to detect early signs of disasters and then act to control the situation. This is often the case in high-reliability organizations. Tertiary prevention strategies are designed to minimize the impact and adverse effects of disasters. Coordination of resources and alliances with supportive organizations are part of tertiary prevention strategies.

Although it is difficult and sometimes impossible to prevent certain types of disasters, the process of strategic preparedness allows organizations to plan, organize, and respond more efficiently and effectively. Epidemiologic research on disease prevention shows that prevention is more cost-effective and efficacious than managing disease and implementing behavioral interventions. These same principles should be used to guide the SPP process:

1. Plan early and be proactive;
2. Target prevention strategies towards high-risk, high-probability events;
3. Develop comprehensive, multi-level policies and procedures to help guide disaster recovery;
4. Train employees and rehearse the plan; and
5. Evaluate the performance of the plan.

Developing Containment and Damage Control Strategies

Containment and damage control strategies are necessary for minimizing the effects of impairment and maximizing recovery efforts. There are three containment levels fundamental to the preparedness planning process. The first level is infrastructure development. Organizations, especially hospitals, must develop containment infrastructures to deal with the loss and damage from an event. Available infrastructure to support initial recovery efforts will reduce the duration and probability of damage escalation.

The second level focuses on developing a clear and concise containment process. Well-defined procedures, the assembly of recovery teams, and the availability of communication systems will ensure an efficient, coordinated, and routine approach to containing and controlling damage. The third containment level strategy focuses on the outcome of the disaster. When a disaster occurs, it is critical for responders to know information about the what, who, where, and how of a disaster. This level of information gathering, processing, and disseminating is vital for accurate and adequate deployment of response resources.

Each containment level, infrastructure, process, and outcome is necessary and essential to include in the strategic preparedness plan. Without a containment strategy, response and recovery efforts become inefficient, ineffective, and costly. There are certain barriers to containment strategies that have to be considered:

1. Hospital culture;
2. Hospital organizational structure (hierarchical or flexible);
3. Resources (financial, physical, operational, personnel); and
4. Preparedness alliances and partnerships.

Developing Organization Response Strategies

Hospitals have a significant response role should disasters occur. In planning for their response role, hospitals must examine potential problems and solutions must be identified prior to an emergency situation. The failure to do so will severely hinder their response and may result in unnecessary casualties. Some of the fundamental issues that affect the preparedness response level of any healthcare system are as follows:[27]

1. The US healthcare delivery system is experiencing an increased patient acuity and utilization of emergency departments for primary and non-urgent care, as well as staff shortages and decreased medical and financial resources. Care must be taken by hospital planners to maximize response capability without taxing the already fragile situation;
2. Hospitals will be the "first receivers" as patients exposed to biological, chemical, radiological, or infectious disease agents seek care in hospital emergency departments as serious symptoms begin to emerge. Because emergency departments already are overcrowded and hospitals operate at capacity on a daily basis, a successful planning initiative must consider surge capacity, or a means to free up patient care areas and resources to care for large numbers of affected individuals;
3. Even a small event with minimal casualties can overload the hospital response system. In addition, integration and coordination of the spectrum of response agencies in the community will enable the combination of existing resources to provide for the optimum outcome;
4. Existing information technologies, such as those that facilitate data transfer, real-time situational analysis, diagnostics, and surveillance must be utilized to manage the flow of information before, during, and after an event to improve coordination, incident management, and response; and
5. Training must be ongoing. Hospital staff members must be familiar with the incident command structure of the facility and all the policies and procedures associated with emergency event response. An emergency response plan must be constantly evaluated through exercises to identify strengths and weaknesses and to keep it current and realistic.

Conclusions

Even though there has been a significant increase in the number and severity of disasters, little preparedness planning has taken place at the community, regional, and national levels, and virtually none has occurred at the level of individual organizations. In this paper, it is argued that SPP is needed by many hospitals. This planning is similar to traditional product/market-oriented strategic planning, but is more focused on organizational risks of disasters, and organizational response roles. Hospitals in particular must consider the importance of strategic preparedness planning.

Many hospitals, because of their mission, technology, and the materials they handle, are at a relatively high risk for disasters. In addition, hospitals have extremely critical response roles when crises and disasters occur and face the challenge to identify the disasters that are likely to occur and plan for the future. Useful tools are available for scanning, monitoring, forecasting, and assessing the external environment in order to identify potential disasters. Those hospitals at high risk for experiencing a disaster must develop prevention strategies where possible, and also formulate strategies for containment and damage control for those crises and disasters that are not preventable.

Healthcare organizations, such as hospitals that will be among the "first receivers" when disasters occur, also must develop organizational response strategies. In planning these strategies, hospitals must anticipate possible problems prior to emergency situations and be prepared to deal with them when they occur. Preparedness places a particular burden on hospitals for training and continuous assessment of emergency response capabilities.

Strategic preparedness planning has become the new imperative for hospitals at high risk for disasters as well as for response roles when these events occur. Strategic preparedness planning goes beyond traditional product/market strategic planning to include the consideration of risks for a particular hospital. Healthcare leaders, in particular, must rise to the challenge of SPP.

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