Best Practices of Hospital Security Planning For Patient Surge

A Comparative Analysis of Three National Systems

Executive Summary

This paper examines three international healthcare security systems as they relate to patient surge in Canada, Israel, and the United States. Its purpose is to compare the systems, to highlight unique characteristics that define those systems, and to initiate the development of best practices that transcend national boundaries.

Several significant national characteristics of demographics, healthcare systems, and political climate, among others, present challenges to translating best practices among these three countries. However, we have found that best practice strategies exist in areas of communications, coordination, building design, space adaptability, and patient routing (both from the community to the hospital, as well as within the hospital) that can be shared and incorporated into the healthcare preparedness efforts in all three countries.

The intended audience is hospital administrators, emergency planners, and security professionals of healthcare facilities that are interested in strengthening their own systems by learning from best practice research strategies.

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Introduction

Areas that experience disasters more frequently take planning for disasters more seriously. Healthcare workers need only experience a single disaster or catastrophic incident before credence is given to having robust security plans and systems in place. Healthcare security professionals, already sold on the value of maintaining order during incidents, have understood this for decades. Systems planners at provincial, state, and national levels that have experienced a disaster or catastrophic incident will also attest to the association between in-place healthcare security systems, preservation of healthcare operational capacity during and after an incident, and ultimately the impact of failure in these areas on the public's confidence in the healthcare system's ability to respond.

Background

The overarching goal of security and safety in healthcare is to provide a secure environment for the patients, their visitors, and the caregivers of the facility. It is a commonly accepted premise that during an emergency or disaster situation, the resources needed to maintain a secure environment will stress existing systems. The motivation of this paper is to compare systems, to highlight unique characteristics that define those systems, and to initiate the development of best practices that transcend national boundaries. United States researchers traveled to Israel where they were hosted by multiple national emergency preparedness and response entities[1] with the specific intent to discuss the application of security measures to the healthcare environment.

Presentations and discussion periods were provided for all site visits and included tours of the healthcare facilities. Four of the six United States guests performed key operational roles in Louisiana during the response to the 2005 catastrophic impacts of Hurricanes Katrina and Rita, and also presented U.S. regionalization strategies specific to patient surge planning in hospitals to officers of the Israel Defense Forces (IDF).

The personal experience of the researchers, additional research conducted through personal interviews, and an extensive literature review provided comparable perspectives among the three healthcare security systems. The primary researchers observed that systems for managing patient surge and the accompanying security challenges have been, among the three countries studied, most effectively developed in Israel. The approach to provide applicable best practices that can be effectively translated from Israel to other countries of the world stemmed from this observation.

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[1] Israeli Ministry of Health Emergency Division, Magen David Adom (main ambulance entity, Rambam Medical Center, Kiryat Shmona City Hall and Shelter, the Community Stress Prevention Center, the Israeli Home Front Command Medical Division, Hadassah Medical Center [Level I Trauma Center], and Shaare Zedek Medical Center ([Decontamination Center]).

Demographics

National demographic characteristics have an undeniable influence on the variations of how healthcare security systems have developed in each country. While Canada and the United States share similar landmasses of approximately 10,000,000 km^2 the population density in each country is very different; Canada's population is approximately 33 million^2 and the United States population is approximately 308 million^3. By contrast, the landmass of Israel is about 21,000 km^2 with a population of approximately 7 million[4]. This fact alone suggests that national planning and preparedness initiatives may be more easily accomplished in Israel with its smaller landmass and population. National demographics are summarized in Table 1.

Table 1: National Demographics[5]

Canada	Israel	United States
Location: North America	Location: Middle East	Location: North America
Capital City: Ottawa	Capital City: Jerusalem (Yerushalayim)	Capital City: Washington, D.C.
Main Cities: Toronto, Montréal, and Vancouver	Main Cities: Tel Aviv-Yafo and Haifa	Main Cities: New York, Los Angeles, Chicago, and San Francisco
Population: 33,212,000	Population: 6,800,000	Population: 307,858,480
Area: 9,976,140 km^2	Area: 20,770 km^2	Area: 9,372,610 km^2
Languages: English, French, and Inuktitut	Languages: Hebrew and Arabic	Languages: English, Spanish, and over 30 others
Religions[6]: Christian (70%), Muslim (2%), Other (12%), and None (16%)	Religions[7]: Jewish (77%), Muslim (16%), Christian (2%), Druze (2%); and Unspecified (3%)	Religions[8]: Christian (76%); Mormon (2%); Jewish (1%); Muslim (1%); Other (10%); and None (10%)

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[2] http://www.cnn.com/2009/TECH/science/08/12/world.population/index.html?iref=mpstoryview. Retrieved November 4, 2009.

[3] U.S. POPClock Projection. 2009-01-10. http://www.census.gov/population/www/popclockus.html. Retrieved November 3, 2009.

[4] Israel in Figures 2007, Israeli Central Bureau of Statistics, 2009.

[5] Recognition is also given to the many additional religious beliefs for each country that are may not be listed, given limited space.

[6] Religion data comes from NationMaster.com http://www.nationmaster.com/index.php. Retrieved Nov. 4, 2009.

[7] Ibid.

[8] Ibid.

Political Climates

The political climate of each country also bears consideration as it most certainly impacts the development of emergency preparedness and security systems for each nation. The level to which citizens are actively engaged in emergency preparedness and security measures in their daily lives impacts how accepting they are of such measures in a healthcare facility.

The frequency of war and terrorism in Israel undeniably influenced the development of a robust national emergency preparedness system; with the stringent security measures it imposes on the general citizenry and the nation's subsequent culture of preparedness. The mandatory national military service within the Israel Defense Forces for any non-Arab or Druze (men) Israeli citizen over the age of 18 (men serve three years and women serve two), a reflection of their ongoing political conflict, also fosters their culture of preparedness. This level of national awareness and preparedness establishes an expectation among the public for pro-active security measures, even in the healthcare setting.

By comparison, acts of terrorism within Canada and the United States have been rare and a degree of complacency regarding preparedness exists among their general citizenries, which can impede the development of robust security practices that restrict or control access.

Canadian and American national systems emphasize increasing preparedness at the local level[9,10]; however, for both countries, a culture prevails that does not give as high a credence to developing a level of sophistication that the Israeli system has in place and, as such, security systems are less robust in the healthcare environment. The political and cultural climates have an undeniable influence, however. For example, in the United States, partly due to the level of competition among healthcare facilities, hospital administrations may be resistant to imposing stricter access controls, screenings and surveillance for fear of losing customers to facilities deemed more open and service-oriented. Some hospital administrators in the United States argue that such security measures not commonly seen in the United States, may lead to the public perception that significant security issues exist at the hospital, resulting in potential patients seeking care in another facility they perceive to be safer.

A distinguishing characteristic of Canadian healthcare is the use of a single-payer system through which citizens have universal access to a range of physician and hospital services at public expense[11]. As a public, open-access system, without the historical or risk-driven realities of either Israel or the United States, the culture may be more adverse to a heavy security presence at public and/or private institutions.

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[9] Including, but not limited to: Government of Canada. Responding to Chemical Biological, Radiological, and Nuclear (CBRN) Threats: A Federal Perspective. February 2003.

[10] Including, but not limited to: US Homeland Security Presidential Directive (HSPD) 5 and subsequent bioterrorism defense measures.

[11] Downie, Jocelyn; Caulfield, Timothy; Flood, Colleen; *Canadian Health Law and Policy: Third Edition*. (LexisNexis Canada Inc, 2007).

In Israel where medical services are provided by five national health management organizations, priorities are placed on safety and security over individual inconveniences in regard to physically accessing a hospital. In fact, during emergencies, all hospitals fall under the direction of the National Health and Hospitalization Authority (NHHA), which is responsible for planning and preparedness and the operation of Israel's health system during emergencies. During emergencies, the NHHA delegates central operational control of all general hospitals to the Chief Medical Officer of Home Front Command[12], further imbedding security and military processes into hospital operations. Further, medical units of the Israel Defense Forces can be mobilized in emergencies to support the civilian population and hospitals, if necessary. In the case of a terrorist attack, all hospitals go into temporary but pre-established "War Time" emergency mode and cease regular operations.[13]

Hospitals in the United States and Canada also have pre-established emergency processes that are triggered by prescribed events. However, the unique component in Israel is the level of integration that exists among the hospitals, the government, and the military, regarding planning and preparedness.

The presence of this type of military involvement during emergencies or facility checkpoint and screening operations commonly found in Israel on a daily basis are rarely seen in Canada or the United States except on military grounds where hospitals exist or in high-crime areas.

All-Hazards Planning

While each of these countries has a unique approach to security and emergency response, they all apply an all-hazards approach to emergency planning. All-hazards planning does not imply preparedness for any and all hazards that may occur; rather, it recognizes that there are commonalities in disasters that will require similar response activities that apply to a spectrum of emergency or disaster incidents. All-hazards planning strengthens a healthcare facility's resilience to respond to a range of emergencies or disasters and ultimately protect its operational capacity so patient care capabilities will be minimally interrupted.[14]

Incident Management Systems – National Requirements

The foundation of any all-hazards plan and response effort is effective command and control. This exists to avoid chaos, duplication of efforts, poor communication, and lack of coordination. With this fact in mind, Israel long ago developed a full Incident Command System (ICS) and in August of 2005 issued Amendment of Police Law No.

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[12] Home Front Command: a civil defense organization that is part of the Israeli Defense Forces (IDF) and under the command of the IDF chief of staff."

[13] McGlown, K. J. (Ed.) (2004). Terrorism and Disaster Management: Preparing Healthcare Leaders for the New Reality. Chicago, IL: Health Administration Press.

[14] Waugh, Jr., William L.; Terrorism and the All-Hazards Model. Presented on the IDS Emergency Management On-Line Conference, June 28 through July 16, 2004.

19: Paragraph 90-D(a), which established that in a mass casualty event, the Israeli Police Force would be responsible for the command and control of the event and serve as Incident Commander (IC). It is also consistent practice in Israel for Emergency Medical Services (EMS) to command the medical response under the direction of the IC.

In the United States, ICS was officially adopted by all government agencies and hospitals in 2007[15]. Since then, training and exercising using ICS has increased. The United States ICS practices determine the Incident Commander by the nature and the location of the incident. Canadian ICS practices are common in many provinces and territories; however, the system itself is still under development, and the Canadian National Framework for Health Emergency Management recognizes the benefits of ICS and recommends its adoption in healthcare institutions. When comparing preparedness levels among each country, it might be argued that the maturity of Israel's incident command process has been a significant factor in the successful implementation of other response processes.

Perimeter Security

Effective all-hazards planning recognizes that good perimeter security is essential to providing a safe and secure environment. It is commonplace in Israel to anticipate security checkpoints on the perimeter of the facility grounds that screen vehicular traffic prior to allowing parking lot access. Ambulances arriving to the facility grounds, regardless of the stated criticality of the patient, are subject to additional checkpoints to ensure the validity of the ambulance unit, paramedics and patients, and the legitimacy of the ambulance gaining facility access. Pedestrian checkpoints are deployed as an additional layer of access control; every individual seeking to enter a facility must complete the screening process, which includes passing through metal detectors and bag inspections. Israel's history of war and terrorism is a reality that validates the need for vigilant security precautions and has conditioned its population to be accepting—even expecting—of such precautions.

In comparison, both Canada and the United States have experienced fewer acts of war or terrorism within their national boundaries and, despite a growing realization for vigilance regarding the possibility of such acts, their citizenry would likely be disagreeable to healthcare perimeter control measures similar to those practiced in Israel. Scarce literature exists that suggests Canadian and United States healthcare facilities routinely deploy restrictive screening or access control on their grounds or entrances; although, most now address the issue in emergency plans. For the majority of Canadian and United States citizens, the only place they likely encounter such screening processes or checkpoints is the airport.

Additional all-hazards elements that all three countries employ are internal access control to provide pedestrian control inside the facility and closed circuit television (CCTV) to provide surveillance of entrances, driveways, and staging and other strategic areas. These two elements have been widely and effectively implemented in all three countries.

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[15] Federal Emergency Management Agency (FEMA) FY 2007 National Incident Management System Compliance Metrics Guide for Tribal Nations and Local Governments. April 2007.

Communications

Emergency communications is an all-hazards planning element that addresses establishing redundant forms of communication that use a variety of mechanisms to ensure uninterrupted communication with essential agencies and response partners. Throughout the United States and Canada, response agencies, hospitals, and healthcare systems have worked to build redundant systems that include satellite, telephone, two-way radios, e-mail, text, or pager "blast" messaging among other communication modes. Effective communication during an event or incident remains one of the most cited deficiencies in healthcare After-Action and Lessons Learned Reports from drills and actual incidents, however, the U.S. Healthcare Preparedness Program [HPP] has put forth extreme funding efforts to improve this issue[16].

Israel has developed a unique and effective communications mechanism that simultaneously communicates a written message from the Ministry of Health to all hospitals and EMS via electronic light emitting diode (LED) boards strategically located in emergency departments and/or communication centers in hospitals, EMS, and other agencies. This system utilizes a telecast notification board to provide fast, consistent, and effective communication to all personnel simultaneously on an extremely reliable network. Over the years and through multiple mass casualty incidents and declared wars, this system has remained operational despite some direct damage to facilities. Electronic communication boards are strategically placed that provide visual access to real-time emergency activities. This form of communication allows necessary personnel to receive information efficiently (i.e., while they are monitoring other forms of communication devices or performing other tasks).

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[16] The U.S. National Healthcare Preparedness Program (formerly Hospital Preparedness Program) has administered over $3.38 billion to healthcare systems that have includes establishing emergency communications as a preparedness focus area.

Table 2: All Hazards Planning

Nation	ICS and National Emergency Response Requirements	Perimeter Screening	Communication
Canada	• Standards built into accreditation process • National standards on emergency management and business continuity[17] • Provincial regulations require a plan • Widespread use of Incident Management Systems in provinces and territories (including health) • National Incident Management System under development	• Not common to have continuous screening at perimeter of grounds or buildings	• Commonly cited deficiency or failure in event and drill after-action reviews • Voluntary standards to coordinate communication activities with key stakeholders in accordance with incident management requirements • Recommendation for interoperable communication
Israel	• Driven by Ministry of Health (MOH) with doctrines distributed to all hospitals • 100% voluntary participation • Full ICS in use • Police always Incident Commander • EMS commands medical response under IC	• Vehicle checkpoints at perimeter of the facility grounds • Pedestrian screening at building entrances • Screening EMS units located at the Emergency Department (ED) entrance	• Unique system using strategically placed electronic LED, telecast notification boards to communicate real-time information across the healthcare sector
United States	• Accreditation standards and state regulations require a plan • Grant deliverables require National Incident Management System (NIMS) compliance • ICS adopted by all government agencies and hospitals • Incident Commander determined by incident	• Not common to have continuous screening at perimeter of grounds or buildings	• Commonly cited deficiency or failure in event and drill after-action reviews • Current federal mandates for interoperability

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[17] Canadian Standards Association, Z1600; Emergency Management and Business Continuity Programs.

Planning for Patient Surge Incidents

Patient Movement

Patient surge incidents, whether they require decontamination or are the result of natural or man-made incidents, necessitate the ability to absorb a large number of patients in a short period of time. The ability to maintain the desired safe and secure environment is impacted by the triage process of patients at the incident scene and as they arrive at the facility. This is an area where the Israeli healthcare system has many refined best practices. Under the direction of NHHA, the Chief Medical Officer for Home Front Command works with civilian emergency and rescue organizations, as well as all hospitals and clinics, on an ongoing basis to plan and prepare for emergencies. Planning efforts include the coordination of patient movement from the incident scene to the pre-identified hospitals; thereby improving the likelihood those patients will be routed to a facility with the appropriate resources to provide the necessary level of care. This not only significantly improves patient outcomes but also assures appropriate distribution of patients, and reduces burden on facilities, wait times for patients and their visitors, and the inevitable security issues that can result.

Variations of this concept are currently being practiced in areas of the United States and Canada (e.g., trauma networks initiatives have established call centers that coordinate the movement of trauma victims/patients within a defined geographic area). Currently, such trauma networks are designed to handle small-scale incidents involving minimal numbers of patients; however, credence is increasingly given in both countries to expand these efforts to include the management of patient movement during mass casualty incidents. As mass casualty systems mature and patient movement processes are developed, planners must incorporate strategies that recognize that patients moved via the EMS system will only represent a percentage of the patient surge that presents to the emergency departments.[18]

Individuals with minor injuries, or those commonly known as the "worried well," will arrive at the hospital by means other than EMS in numbers that can quickly overwhelm an unprepared or underequipped facility. This phenomenon has been repeatedly documented as it relates to terrorism incidents such as the London bombings[19,20] and the Tokyo subway sarin gas attack[21], as well as more recent events, such as H1N1 outbreaks.

Inefficient processes that hinder access to the facility can contribute to the anxiety of and is a factor of the "worried well" seeking medical attention. The common practice in Israeli hospitals of a two-level triage of patients upon arrival expedites this access. Simply defined, two-level triage separates patients as either non-ambulatory or

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[18] Quarantelli, E. L. (1989). How individuals and groups react during a disaster: planning and managing implications for EMS delivery. Denver, CO: National Disaster Medical System.

[19] Redhead, J. W., Ward, P., & Batrick, N. (2005). Prehospital and hospital care. *New England Journal of Medicine*, *353*, 546-547.

[20] Ryan, J. M. & Montgomery, H. (2005). Terrorism and the Medical Response. *New England Journal of Medicine, 353(6)*, 543-5.

[21] Ishimatsu, S., Takasu, N., (1995) The Tokyo Subway Sarin Incident: Emergency.

ambulatory, as they are directed to the emergency department or to an alternate area of the facility. At these locations, further screening is conducted and patients are rerouted, as necessary. Two important factors contribute to the successful implementation of this two-level triage system: on-site lower physician-to-patient ratios and architecturally built-in surge capacity.

A significant factor in Israel's success with this is that the majority of physician offices are located within the hospitals. This allows for immediate availability of doctors during disasters. Physicians who are already on-site present to the emergency department upon notification of an incident that may create a patient surge. This allows a medical team, composed of a doctor and a nurse, to be assigned to each critical patient. The team moves with the patient from the emergency department to diagnostic testing areas and continues through the system until the patient is ultimately admitted or discharged. If it is necessary to wait a significant amount of time for test results before deciding to admit or discharge the patient, the waiting occurs outside of the emergency department and under the supervision of medical personnel. This is one-way directional flow for the patient. The patient is not returned to the ED, which subsequently increases the rate of patient throughput during surge conditions. It should be noted that to successfully complete the two-level triage process, the hospital must be able to manage the surge of patients that are triaged as ambulatory in another area that is properly equipped for this level of patient care.

Throughout Canada and the United States, the traditional four-level triage system remains in use for patients that present to the hospital. This practice assigns a single doctor and a few supporting nurses/aides responsibility for several patients simultaneously in each of the four defined treatment areas. Further, patients initially triaged to the emergency department will be routed to diagnostic testing and returned to the emergency department, creating two-directional patient movement within the emergency department. This process can take longer, require more staff and space, may slow the throughput of patients through the emergency department, can increase wait times for the critically injured, and may increase the anxiety level of patient's family and friends.

Long wait times, crowded waiting areas, and high anxiety are all factors that can lead to increased security incidents on any day and especially during disaster situations. Strategically planning for patient movement during a surge event to ensure adequate space and staff will minimize resources needed to address potential security concerns.

Space Adaptability and Flexibility

Effective management of patient surge requires adequate and appropriate space to provide the necessary treatment. Historically it has not been common practice throughout Canada and the United States to "build in" surge capacity when designing healthcare facilities. Many see it as impractical for hospitals to architecturally design space for patient surge that otherwise go unused during non-surge incidents (although in the United

States, this situation is increasingly a gray area[22]). Increasing attention, however, is being directed toward applying creative, cost effective approaches to built-in space adaptability and flexibility. In the United States, the Department of Health and Human Services, Joint Advisory Work Group, has recommended that collaboration occur with standards bodies to develop guidelines for "dual purpose" construction[23]. They further suggested that the placement of medical gases and power in areas that could be used to accommodate patient surge, such as hallways, lobbies, dining rooms, etc., be considered for new hospital construction, expansions, or renovations. The security benefit is to quickly manage patient surge and movement, including their visitors, to the point-of-care by reducing traffic congestion, anxiety, and the "mob" mentality that often exists where crowds gather. These issues, if not addressed, can lead to increased security incidents and a less secure environment.

Israeli hospitals have long faced significant patient surge incidents resulting from their history of war and terrorism. In 1976, the NHHA established a professional committee to address hospital preparedness regarding chemical weapons threats. The committee then mandated several actions, including preparing for large numbers of casualties. Today, it is common practice to build surge capability into the structures and/or create dual-use spaces. During Israeli wartime, all hospitals can increase their capacity by 30% to 40%[24]. Some examples of how they accomplish this include:

1) Walls or ceiling of a cafeteria or large lobby are equipped with medical gases strategically placed behind easily removable panels that allow for the space to be quickly converted into a functioning patient ward.

2) Hallways in patient care areas are equipped with medical gas connections allowing for inpatient surge capacity.

In Canada and the United States, existing fire code requirements prohibit piping of oxygen into hospital hallways and, thereby, do not allow for the surging of patients within the hallways. Although this issue is a legitimate safety concern, this prohibition creates an unintended patient care constraint during a patient surge situation.

Emergency room patient surge capacity can be achieved through careful design of treatment rooms that provide easy access to diagnostic equipment, built-in equipment, and that can allow additional stretchers to be placed in patient bays, next to more permanently placed beds so two or more patients can be treated in an area that may typically treat one. These best practices commonly seen in Israel contribute significantly

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[22] Barbera, J. A., Macintyre, A. G., & DeAtley, C. A. (October 2001). Ambulances to nowhere: America's critical shortfall in medical preparedness for catastrophic terrorism. BCSIA Discussion Paper 2001-15. Executive session on domestic preparedness (ESDP) Discussion paper 2001-07. Boston: John F. Kennedy School of Government, Harvard University.

[23] Department of Health and Human Services, Joint Advisory Work Group for Research and Development/Modeling, Simulation and Analysis, Healthcare and Public Sector Operational Sustainability Priority Sub-group recommendation to The United States Department of Health and Human Services, Office of the Secretary, Office of the Assistant Secretary for Preparedness and Response. October 2009.

[24] McGlown, K. J. (Ed.) (2004). Terrorism and Disaster Management: Preparing Healthcare Leaders for the New Reality. Chicago, IL: Health Administration Press.

to the ability to maintain a safe and secure environment by increasing throughput of patients, minimizing the anxiety and associated security concerns that come with long wait times, and problems accessing care during an emergency.

Facility design strategies also influence the level of safety felt by staff. Their reluctance to work in an unsafe environment will affect the healthcare facility's ability to provide care. Healthcare facilities cannot risk that staff will not be at-hand due to concern for their own safety during a patient surge incident. This underscores the importance of considering safety when planning for patient surge incidents. It is optimal to incorporate security features into building design when planning for new space or renovating existing space to accommodate patient surge.

Many security technologies can serve a dual purpose of providing a level of security on a daily basis and contribute to the ability to manage the influx of people (e.g., patients, visitors, volunteers, and staff) during a patient surge incident. For example, access control technology that is used on a daily basis (e.g., labs, pharmacies, areas housing dangerous chemicals, and/or agents of opportunity) can also be used to restrict access to additional areas of concern during a patient surge incident when human security resources may not be available to control access. Access control devices can manage the spread of infection, prevent contamination, or provide just-in-time quarantine capability by limiting access to specific areas of the facility without having to rely upon security personnel as heavily, at a time when their responsibilities will be extraordinarily high. Video surveillance can also serve a dual role of providing daily security and helping to manage patient surge incidents. This technology can monitor behavior in multiple areas simultaneously and aid in the early detection of suspicious activity.

While a careful balance between reliance upon technology and its replacement of human security resources must be managed both daily and during patient surge incidents, these technologies may allow for human resources to be more effective in other important areas of securing a healthcare facility.

Table 3: Surge Planning Summary

Nation	Current Situational Awareness	Patient Movement in a Mass Casualty	Space Adaptability and Flexibility
Canada	• Operates over 100% capacity • Little built-in physical surge capacity • No universally accepted surge goal • Some areas use alert systems; staff respond to news reports and "tune-in" information on badges	• Hospitals represented in Incident Command and route patients according to bed availability • 4-level triage • Limited Medical Doctors (MDs) • Two-way EDs • Regular discharge process	• Many hospitals face challenges with ability to flex space for added surge capacity • Many large facilities very old and not flexible
Israel	• Surge capability generally built into architectural design • Ample staff • Staff respond spontaneously to news reports; abundance of MDs and RNs	• Predetermined routing to few hospitals • 2-level triage • 1 physician and nurse with each patient for severe cases • One-way ED • Recheck at discharge	• Inherent in design is the ability to convert spaces for surge capacity use • Open architecture in most facilities allows for flexibility in space usage • 30% to 40% surge capacity built into hospitals
United States	• Operates near 100% capacity • Little built in physical surge capacity • 500 million regional surge goals[4] • Nursing shortage • Alert systems and staff respond spontaneously; current shortage of health professionals makes staffing for surge difficult	• Many regions still struggle with how to route patients-some networks in operation • 4-level triage • 1 physician in each area • Two-way ED • Regular discharge process	• Many hospitals face challenges with ability to flex space for added surge capacity • Many large facilities are old and not flexible

Discussion

The evolution of national emergency management systems is undoubtedly influenced by its nation's size, its experiences with war, terrorism, and disasters, and its political leadership's effectiveness at implementing preparedness strategies. Countries such as Israel have a more advanced national system of readiness that has evolved to become an integral part of their overall sophistication of local and national preparedness. While the healthcare community in United States and, to some extent, Canada is now aggressively working toward regionalization of planning and response within the healthcare community as a whole, Israel has developed a coordinated response plan that includes the Ministry of Health, The Home Front Command, Magen David Adom (Israel's national EMS entity), the hospitals, and community volunteers. Although country demographics and subsequent jurisdictional aspects of Canada and the United States present challenges to developing a single, nation-wide system that includes emergency management approaches specific to security and safety, there are lessons to be learned from Israel's best practices.

Healthcare security and emergency management professionals must endeavor to educate healthcare facility administrators on the linkages between security elements and effective emergency response. Without the understanding of how vital and vulnerable a healthcare facility can be during a time of disaster, it is unlikely that administrators will support the necessary financial investment in the building's design.

A critical step in emergency planning for healthcare facilities should be to conduct a comprehensive Hazard Vulnerability Analysis (HVA). Consideration of how the facility's physical infrastructure might impact or be impacted by each of the hazards analyzed should be included. Action plans should be developed to address the priorities identified in the HVA. Because financial limitations can often limit mitigation efforts recommended in the action plans, healthcare facilities should take advantage of new construction or renovation projects to build surge capacity and security features into the building's design.

All healthcare facilities should participate in community emergency response planning. For those facilities just getting started, the local jurisdiction's emergency planning authority is an excellent resource to find out how to get involved in community planning.

Regionalization

Several concepts in the Israeli system can be replicated into the larger jurisdictional parameters of Canada and the United States, such as the concept of regionalization. In the United States, the application of in-state regionalization exists (albeit in different degrees of development among the states). Regionalization is more solidly in place in Louisiana where hurricane preparedness has played a significant role in shaping the state's overall planning and response efforts. This organizational approach to preparedness has not only served to facilitate effective planning, but it has been repeatedly used in effective response.

Under the Hospital Preparedness Program (HPP)[25] and prior to Hurricanes Katrina and Rita in 2005, Louisiana began to develop a regional infrastructure for over 200 hospitals that included full service, specialty, veteran healthcare administration, private and public, for profit, and not-for-profit hospitals. This coordinated infrastructure supported the efforts that transported and sheltered thousands of hospital patients and community members during the flooding caused by Hurricane Katrina (in the New Orleans region) and by Hurricane Rita in (the Lake Charles region[26]). These regionalization efforts were examined in detail, and a strong association was found between the HPP funding recipients and leadership at the local level. In this study local emergency managers identified security planning for disasters as high a priority as establishing community relations, having evacuation policies, and supplies of oxygen and water (both drinkable and non)[27]. The HPP funding efforts indirectly resulted from the 9/11 terrorist attacks and prompted the United States to initiate development preparedness strategies. A parallel funding stream in Canada is not currently in place.

Communities as a whole tend to believe that natural disasters and global acts of terrorism are increasing. However, the perspective prevails that while an incident will occur somewhere, it will not occur in their locale. The experience of a disaster or catastrophic incident, and the subsequent short-and long-term impacts, is generally necessary before communities and nations are prompted to implement preparedness measures. Though not to the same degree, terrorism incidents have occurred in Canada[28,29] and the United States[30], that have led to additional value being placed on developing preparedness strategies, however, without an actual disaster incident, momentum of these programs sometimes suffer.

For areas that experience greater frequency of incidents, opportunities exist to further develop and enhance their preparedness systems. The United States demonstrated an increased preparedness level from its 2005 catastrophic hurricane season to its 2008 impacts of Hurricanes Gustav and Ike. For example within this period, the development of the Medical Institution Evacuation Plan occurred and was successfully used to

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[25] The original name of the program was the National Bioterrorism Hospital Preparedness Program (NBHPP). Hospital Preparedness Program Grant Guidance of 2002. The HPP was originally administered by HHS Health Resources and Services Administration (HRSA), but was moved to HHS Office of the Assistant Secretary for Preparedness and Response (ASPR), where it now resides, pursuant to the December 2006 Pandemic and All-Hazards Preparedness Act (PAHPA).

[26] Louisiana Hospital Emergency Preparedness and Response Plan; Designated Regional Coordinators Emergency Operations Plan.

[27] Downey, E, Beyt, G, Rice J, The Relationship of Transformational Leadership to Organizational Performance of Hospital-Based Disaster Coordinators using the Multifactor Leadership Questionnaire. Doctoral Dissertation. Tulane University, School of Public Health and Tropical Medicine, November 2006.

[28] The Halifax Relief Commission was established to help the injured, the bereaved, and those made homeless after the 1917 Halifax, Nova Scotia port disaster until l976. Retrieved, November 15, 2009, from http://www.thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=A1ARTA0003537.

[29] SARS and Public Health: Renewal of Public Health Education. Retrieved November 15, 2009, from http://www.phac-aspc.gc.ca/publicat/sars-sras/pdf/chapter1-e.pdf.

[30] U.S. Presidential Decision Directive 5, *Management of Domestic Incidents*. The White House, Washington, D.C., February 28, 2003.

evacuate hospitals in South Louisiana and Texas as part of the largest evacuation in United States history.[31]

Israel continues to demonstrate the importance of realizing preparedness vulnerabilities, applying strategies for lessons learned, and quickly incorporating those strategies for the next event. For example, during the rocket attacks in the 2007 Lebanese War, one study revealed that a majority of injuries were broken bones incurred while attempting to reach bomb shelters and not injuries directly from rocket blasts. Such findings led to the implementation of a policy to develop in-home shelters, group shelters in tenet buildings, and more community buildings that are equipped to double as shelters.

Conclusion

Regardless of international characteristics, the most effective emergency response planning activities take into consideration two important factors: population behaviors during an incident and the development of robust security plans that are incorporated into daily practice that can be quickly expanded when necessary. Past global incidents have demonstrated that mass casualty incidents will bring not only the injured to the healthcare facility, but also the "worried well", friends and family of the victims, additional staff, and others. When security considerations for managing this type of patient surge event have been incorporated into the building's physical infrastructure and design, and into daily processes, the effectiveness of emergency response efforts may be improved.

As the world prepares for the next catastrophe (e.g., natural disasters, terrorism, or a pandemic), it is crucial that healthcare communities seek out best practice strategies to manage the critical healthcare resources while maintaining a safe and secure environment for those seeking care. Israel's example of coordinated planning across the healthcare spectrum, as well as all response entities is a best practice strategy that is increasingly implemented in other areas of the world. This inclusive approach provides insight not only into the role of enhancing healthcare system preparedness, but in recognizing the role of healthcare systems as a critical infrastructure to functioning communities.

Examples of dual use technology and space adaptability commonly seen in Israel are now being studied and explored in Canada and the United States. Many government, private, and public groups are devoting time and resources to studying the challenges of managing patient surge events. It is imperative that healthcare security professionals continue to be included in this ongoing debate.

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[31] Hurricane Gustav and Ike, Louisiana Emergency Support Function-8 (ESF-8), Health and Medical Response After-Action Report; Louisiana Department of Health and Hospitals; November 5, 2008.

International Healthcare Security and Safety Foundation

The International Healthcare Security and Safety Foundation (IHSSF) is a not-for-profit educational entity dedicated to the professional advancement of healthcare security, safety, and risk management administrators. IHSSF administers a scholarship program and a grant program designed to encourage professional advancement in the field of healthcare safety and security. For more information, please visit: http://www.iahss.org/Foundation/Default.asp.

International Association for Healthcare Security and Safety

IHSSF is affiliated with the International Association for Healthcare Security and Safety (IAHSS), which is the only organization solely dedicated to professionals involved in managing and directing security and safety programs in healthcare institutions. IAHSS offers its members an opportunity to network; address changes in how institutions, their patients, and healthcare providers could better promote care in a safe environment; and develop innovative strategies both nationally and internationally. IAHSS was formed in 1968 by a forward-looking group of professionals in healthcare security and from this initial cadre came ethical standards and educational programs that extend beyond the boundaries of any one nation. For more information, please visit: http://www.iahss.org/About/Default.asp.

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Appendix A: Acronyms and Abbreviations

CCTV	Closed Circuit Television
CHPA	Certified Healthcare Protection Administrator
Col.	Colonel
CPP	Certified Protection Professional
ED	Emergency Department
EMS	Emergency Medical Services
HPP	U.S. Healthcare Preparedness Program
HVA	Hazard Vulnerability Assessment
IAHSS	International Association for Healthcare Security and Safety
IC	Incident Commander
ICS	Incident Command System
IDF	Israel Defense Force
IHSSF	International Healthcare Security and Safety Foundation
LED	Light Emitting Diode
MD	Medical Doctor
MOH	Ministry of Health
NHHA	National Health and Hospitalization Authority
ret.	Retired
RN	Registered Nurse