

Definition

Whilst the Emergency Management (EM) framework defines Normal/Incident, Emergency and Disaster as separate entities, for the purposes of clarity and health care focus in this paper the term “disaster” will refer to any situation in which the demand placed on the health system to provide care has outstripped the system’s ability to deliver said care.

Background

Hurricane Katrina arrived in New Orleans in 2005 killing over 1,800 people. Many of those deaths occurred well after the hurricane passed and after the flooding of the city. The system in New Orleans failed not because of front line clinical issues but because of broader infrastructure and organization deficiencies.

15 years later, should a disaster of similar magnitude impact Canada we might find ourselves in the same position as New Orleans because, while the health care providers understand the medical issues, the front line organizational infrastructure – specifically front-line Nurse and Physician education, training and experience in disaster medicine - has been neglected and remains disconnected from overall health system response.

Any discussion about the preparedness of the medical community in Canada for a disaster must acknowledge certain facts;

1. Disasters are not rare but are episodic with an unpredictable and immeasurable periodicity.
2. While the specifics of an individual disaster may be unpredictable the response to disasters is not.
3. There is a lack of clarity around who bears the responsibility for ensuring that the health response to disasters occurs in a way that the best health care possible is delivered to the greatest number of people possible, even in an environment with diverse jurisdictional boundaries.
4. Coordination and planning are essential, particularly for vulnerable segments of the population such as children, the elderly and those with special needs.
5. The needs of the medical community in preparing for and responding to a health disaster are varied, not always understood by professional disaster managers (Federally, Provincially or at the hospital level) or by other non-clinical responders.
6. Canada faces a specific constitutional (political) challenge to National Health Emergency Management strategy because direct Federal leadership in this arena is contrary to the statutory division of responsibility in the Constitution Act.

Disaster as disease

Disasters can be considered diseases in the sense that they occur periodically, affect the health of communities and individuals, have a broadly predictable pattern of behavior and pathology, and can be planned, for and mitigated against. That said, disasters are the only disease entity where there is no established standard of care. The argument for this has always been that disasters are very diverse and unpredictable. That said, while the details of a specific disaster may be unpredictable the details of the healthcare response is not. It is predictable that;

1. disasters will occur,
2. there will be a surge in demand on the healthcare system,
3. certain patterns of illness and injury will occur over specific time frames,
4. specific resources of the healthcare system will be required in specific time frames,
5. the skill set required in responding to a healthcare disaster is different from the skill required to deliver day-to-day care,
6. Interdisciplinary groups (EMS, emergency medicine, surgical services, critical care, and other clinical services) will be required to have complimentary, coordinated responses that are focused on providing the right care to the right patient at the right time and in the right place;
7. Providing optimal clinical care requires properly coordinated and executed clinical support: labs, blood bank, pharmacy, diagnostic imaging, psychological first aid, patient attendants, equipment (beds, wheelchairs, ventilators, tents and buses, patient identification and tracking, family information and support, among others;
8. specific predictable problems will obstruct the delivery of healthcare in a disaster and
9. while all healthcare disasters will have an impact on the health and well-being of the population, that impact can be minimized by proactively and systematically engaging all professional, nonprofessional and community groups and methodically going through the steps leading to preparedness.

Since more is predictable about a healthcare disaster than is unknown and since the response to disaster in the healthcare environment differs dramatically from routine function, it is not reasonable to assume that we will be adequately prepared by adapting our everyday skills and practices. Disaster response requires a different (quicker) process for problem identification, objective setting, responding with planned tasks, reassessment of the response impact, repetition of the planning cycle in a structured fashion and executive commitment for administration and financial implications.

Who is in charge?

The lack of clarity over who is responsible for what, in preparing for and responding to a health disaster is an impediment to solving this problem.

There is a discontinuity between the Federal and Provincial authorities. Emergency Management has become, in practice, a provincial responsibility. Healthcare has always been within the scope of the provincial governments. However, the Supreme Court of Canada recognized that (notwithstanding Section 91 and 92 of the constitution act) the federal government may infringe on provincial authority as long as the measures are temporary in nature and have a national scope (Laskin, Judson, Spence, & Dickson, 1976). This has resulted in a cooperative relationship where provincial and federal governments have a shared interest. For Example, there is federal legislation that allows for the declaration of a National or geographically specific (usually multi-jurisdictional) "Public Welfare Emergency" (emergencies act 1988, section 5 Part 1 - Public Welfare Emergency) by the government of Canada.

Specifically insofar as public health is concerned, since SARS and the creation of the Public Health Agency of Canada, there is leadership, clinical guidance provided for Public Health Emergencies. This is, however, only one aspect of the scope of disasters and not the most frequent. Other disasters such as wildfires, building fires, evacuations, flooding and other natural hazards or human-induced events are more frequent and can involve more people. Furthermore, by virtue of this being a common occurrence in medicine, the health care system has more familiarity with infectious disease and is better prepared to deal with transmissible illness than other disaster types.

As mentioned, the provinces and territories (P/T) have primary responsibility for the actual delivery of health care and have individual health care provision structures that vary by jurisdiction. Furthermore, within each province and territory, responsibility for funding and coordinating acute care delivery is usually further delegated to regional health authorities, districts, or boards, each of which has considerable control over planning and preparedness. As we have seen clearly during the SARS outbreak in 2003 and the 2009 influenza pandemic, there are many barriers to exchanging of critical data and personnel between jurisdictions both at the P/T level and federally even during a disaster that affects more than one jurisdiction. In addition, the federal and P/T level all are disconnected from the clinical provision of care during a disaster.

In Canada, overall disaster preparedness and response from a federal government perspective is generally assigned to Public Safety Canada (PSC) an organization that is both knowledgeable and with a culture that is focused on disaster readiness. That said, they lack expertise and experience in health care delivery. As such PSC are limited in their ability to direct and support the health care system to prepare for and mitigate disasters.

The converse occurs in the federal health portfolio (Health Canada and the Public Health Agency of Canada) where the organization is extremely knowledgeable in health issues but is not imbued with a culture of disaster preparedness.

A consistent national disaster response is key to minimizing the impact of disasters on the health of Canadians regardless of where they live and key to this is coordinated leadership at the federal as well as P/T level. PHAC and Health Canada along with PSC are uniquely positioned to provide broad standards in health response and cross-jurisdictional cooperation and communication. Specifically, in light of the Federal government's unique position to be able to fill this role, we strongly believe the delegation of health care delivery to the provinces in no way absolves Ottawa of its responsibility to coordinate a national health disaster response.

Federal involvement in disaster response does not in any way impinge on provincial authority in the health care field. Instead it addresses the paramount issue of consistency among responders and shares resources across the country both at a healthcare facility level and at a healthcare professional level [such as the professional organizations for physicians nurses etc.].

Preparing the health care system to respond.

There is an important difference between the delivery of medical care during a disaster, and the general preparedness for and response to disasters by the health sector. The healthcare system's expertise lies in the former and not the latter. As the threat of natural and man-made disasters continues to grow, health care institutions are expected to have the capacity and expertise to receive injured, infected, contaminated and psychologically traumatized patients. This requires a disaster plan that includes:

- A hazard and risk assessment
- Mitigation, Planning, Response and Recovery phases
- Incident Management system for command and control
- The ability to deploy an Emergency Operating Centre in keeping with the scale of the event
- Initial role description checklists A.K.A "job action sheets"
- A structured planning cycle that assesses the impact of interventions and current needs then plans the next step in response
- Structured and rehearsed plans for hazards that are most common (emergency codes)
- A general all-hazard plan that provides a framework for specific responses beyond the standardized emergency codes
- A process for recovery assessment.

Note that while the term "disaster plan" implies one document, it would be more correct to consider it one process that can generate tens of plans (Emergency Codes, a concept of Emergency Operations, business continuity, medical surge, etc.) through a unified and coordinated command.

Health care organizations are aware of the need for a disaster plan but have not been provided practical guidelines or tools that are consistent across the country to prepare one, let alone prepare a standardized plan with all the key components required that would interface well with other regional authorities and healthcare facilities.

In addition, there is no ownership for the teaching of disaster preparedness in the Canadian healthcare system. While healthcare is accredited through a voluntary accreditation process that is national (Accreditation Canada) the emergency preparedness standards are rudimentary and do not reflect the need for an individual facility or agency to connect to the broader health system. In addition, Accreditation Canada does not have any evidence-based tools to help it assess hospitals disaster preparedness or for facilities or agencies to use in developing preparedness programs. Both the Defense Research and Development Canada – Centre for Security Science (DRDC CSS) and the Canadian Standards Association have attempted to develop standards for healthcare facilities and disasters. Neither of these is a clinical organization and to date, neither has any evidence-based tools for the task. The CSA is trying to develop these from scratch while the DRDC paper is based on US documents that are outdated and not always applicable in the unique Canadian context.

Where training has occurred – for example for CBRN preparedness in Ontario in 2005 and during the Olympics in British Columbia’s Lower Mainland in 2010 - there were no resources dedicated to the maintenance of competence. This is a significant issue because of the large turnover of individuals working within the healthcare system.

The result is a system with a series of gaps and redundancies, incompatible plans, and uncoordinated resources. It is a system without standards or an effective uniform interface within the broader national disaster response infrastructure.

This lack of preparedness is not only due to the lack of tools for individual facilities or agencies but rather a lack of commitment to cohesive programs that foster connectivity at many levels. Traditionally, disasters have been conceptualized as having pre-impact, impact, post-impact and recovery phases.^{10, 11} The Canadian National Framework for Health Emergency Management similarly uses the terms pre-event, event and post-event.⁷ Pre-event activities include risk assessments, mitigation and preparedness. Some tools have been developed to aid health care facilities in conducting their own risk and readiness assessments.¹² But despite the existence of a Canadian made tool for Health Care Facility Risk Assessment, there has been no standardized risk assessment performed for hospitals across the country.

A national “all hazards” health response plan could prove to be a valuable resource because it could be adapted by individual health care organizations and used as an organizational template to ensure efficient communication with stakeholders from every sector, including other local medical centres, relevant local/regional and provincial agencies municipal agencies, public health local first responders (EMS, Fire, Police), rehabilitation facilities, and resource suppliers.

As clinicians who interact daily with Canadians in need of health services, emergency physicians are acutely aware of the trust that they put in us as individuals and in the broader system of interconnected and interrelated agencies and institutions within which we work. When it comes to disasters, however, there is a disconnect between health care providers and that system. The absence of federal government leadership and guidance has resulted in a lack of standardized operating procedures or expectations, unclear lines of authority and uncertainty regarding key functional roles and responsibilities that must be executed during a disaster response.

Since most emergencies begin locally with a response that typically develops from the bottom-up, it is critical that top-level planners can coordinate well with frontline responders. Frontline caregivers have identified deficiencies in multiple peer-reviewed research papers¹³⁻¹⁶. Neither Federal nor Provincial/Territorial authorities have addressed these difficulties. More so, in the planning stages, front line healthcare organizations have often been excluded from many federal, provincial and municipal preparedness initiatives, leaving them to plan for disasters in isolation. Minimal emergency preparedness standardization has created institutional variability among government and health care organizations, which will make hospital and multi-agency coordination difficult, if not impossible, during a crisis situation.

Not everything is dysfunctional. As mentioned earlier there is leadership, clinical guidance provided for Public Health Emergencies. As a result, the health care system is better prepared to deal with transmissible illness than other disaster types. If we use the Ebola response as an example, local health authorities received WHO, PHAC, and provincial situation reports daily until the WHO declared the event over. They also receive weekly flu-like/respiratory illness reports from the PHAC and provincial surveillance reports. There is also a willingness by the PHAC to deploy teams to support an RHA or province (depending on the type of outbreak) should there be an outbreak that has cross jurisdictional implications. There is also a standard process for sharing information among the provincial Medical Officers of Health. Outside of the realm of infectious disease there are active cross-jurisdictional MOU's on Healthcare worker Mutual Aid Agreement that have been exercised nationally and activated during the Alberta Fires in 2016¹⁸.

Unfortunately, despite repeated calls in the literature, the availability and prominence of health disaster education and training continues to be limited in this country. Critical gaps continue to exist between clinical medicine, public health and emergency management professionals.

Recommendations

The committee comprised of members of a variety of organizations (see Committee Membership) believes that, when the next major healthcare emergency impacts Canada, the medical response will be limited by gaps that are well known and avoidable, including deficient national planning and training support and limited to no performance expectations. It is the opinion of the committee that any program designed to improve disaster preparedness among Canadian health care facilities and health care providers' will lead to increased emergency response confidence and effectiveness.

The authors of this position paper believe there is a great need to have a coordinated Canada-wide program of health disaster preparedness so as to ensure the delivery of timely high-quality health services to Canadian citizens in the event of a disaster. This should include ongoing disaster training and skill maintenance of all health care providers in Canada, whether they will be involved at the site of an event, a community setting, in transit, a receiving facility, or at a facility dedicated to long term care.

It is the opinion of this committee that the Federal and Provincial/Territorial Governments must do more to promote health disaster preparedness across Canada, including providing the opportunity for health care providers, disaster responders and administrators to train and develop plans together, breaking down planning "silos" and leading to improved cooperation between them.

Finally, there exists a need to cultivate new and support existing health-champions in disaster management in Canada – in line with what has been achieved in other countries. It will be these champions who will become the invaluable leaders within their professions as well as provide the necessary linkages to the multiple agencies that comprise community-based and academic disaster management.

In order to achieve these goals the committee makes the following specific recommendations. It is the opinion of (the committee) that:

1. All healthcare facilities (including hospitals, long-term care homes,) and agencies, (including public health, pre-hospital, patient transport, community healthcare,) must have some degree of competency in disaster preparedness.
2. This competency must include (but need not be limited to):
 - a. incident command,
 - b. triage,
 - c. mass casualty events/mass gatherings,
 - d. hazardous materials as well as a
 - e. common terminology (including basic knowledge and procedures related to biological, chemical, radiological and nuclear events).
3. The planning needs to be high concept and must include an all-hazards approach
4. The planning must be integrated at all levels of the health system.
5. At the institutional level the ideal model for Emergency Management is a dyad model comprising of an upper level administrator with formal training and experience in Emergency Management and a dedicated Physician in the Medical Director role.
6. In addition to the above institutions and agencies must prepare plans that:
 - a. are uniform in format and structure allowing for mutual aid between local facilities and agencies as well as across and between regions and provinces/territories
 - b. are coordinated with Provincial/Territorial & Federal initiatives and support
 - c. have a defined command and control structure based on IMS principles and supported by an emergency operations centre.
 - d. are simple and easy to review rapidly
 - e. include role description checklists A.K.A “job action sheets” that allow for a quick understanding of staffs immediate tasks while activating the next level in response
 - f. are based on best practices,
 - g. are tested and exercised.
 - h. follow a standardized format and include key components so as to allow uniform and interoperable plans that cross Provincial borders. Facilitating this process will require support and guidance from the Federal government within the parameters of the Canada Health Act.
7. Education and training in disaster preparedness should have dedicated annual funding so as to both achieve and maintain said competency.
8. Said competency should be validated through structured cyclical auditing that where applicable should be integrated as a critical factor into the existing evaluation processes of the organization.
9. Disaster response must be a Required Organizational Practice (ROP) without which health care facilities cannot be accredited. Specifically, accredited health care facilities

and agencies must make disaster preparedness an accreditation requirement which is assessed using specific, measurable, and scientifically driven standards.

10. Facility training must include periodic exercises that involve all components of the disaster response and that are objectively assessed for purposes of quality improvement.
11. Any educational program must promote coordination of services and alignment of disaster plans between the various health care providers and health system components within a community such as first responders, fire, police and relevant government and local agencies involved in health emergencies in order to ensure ongoing health care to all citizens.
12. All planning must take into consideration vulnerable segments of the population such as children, the elderly and patients with special needs.
13. In each jurisdiction the relevant professional colleges must support the development and delivery of professional education in disaster preparedness to trainees and to practicing professionals.
14. All training and education across Canada – whether delivered by Federal, Provincial or Territorial authorities, should share:
 - a. common resources for risk assessment, readiness assessment, planning and reporting
 - b. common guidelines upon which they can base their planning, with the resultant uniformity in disaster preparedness.
 - c. common structure/ education models for maintenance of disaster preparedness competence for all responders/ care providers
 - d. clarification of the division of authority between health care facilities, regional authorities, the Ministries of Health, the Public Health Agency of Canada and other Federal and Provincial/Territorial agencies
 - e. common reporting, command and communications methodology between health care facilities, regional authorities, the Ministries of Health, the Public Health Agency of Canada and other Federal and Provincial/Territorial agencies
15. In order to ensure interoperability between regions and all levels of healthcare, the Federal government in cooperation with the Provinces & Territories must provide the uniform planning tools and resources to achieve the previous point. Ideally, a federal health emergency response plan should include:
 - a. a core set of concepts, principles, terminology, and technologies covering the incident command system;
 - b. a multi-agency coordination systems;
 - c. a unified command protocol;
 - d. a training strategy;
 - e. identification and management of resources;
 - f. a process for defining qualifications and certification;
 - g. and tactics that support the collection, tracking, and reporting of incident information and incident resources¹⁹
16. While the training at the federal and provincial/territorial level should assist organizations in breaking down their inter-organizational silos, all training should also

emphasize the breaking down planning and communication silos within healthcare facilities

17. A national database of unidentified patients, ideally with trackable location identifiers, should be created and be available to all health care centres in order to ensure effective identification and reunification of patients and families.

Summary

In summary, despite evidence to the contrary, most authorities in Canada perceive our healthcare disaster readiness to be far more advanced than it is while in fact we remain dangerously unprepared. We believe that our own 'Hurricane Katrina' moment is inevitable unless all levels of government acknowledge these gaps and begin to actively engage front line clinical care groups (including national associations as well as P/T level clinical organizations) in remedying this. The committee has identified the areas of improvement and made 17 recommendations to remedy the existing gaps.

The drafting committee is comprised of members of:

The British Columbia Centre for Disease Control (BC CDC)
The Canadian Association of Emergency Physicians, (CAEP)
The Centre for Excellence in Emergency Preparedness (CEEP)
The National Emergency Nurses Affiliation (NENA)
Public Health Ontario (PHO)
National Association of EMS Physicians (NAEMSP)
Canadian College of Family Physicians (CCFP)
World Association of Disaster & Emergency Medicine (WADEM)
Society of Rural Physicians of Canada
International Association of Emergency Managers (IAEM)

The committee was multidisciplinary (including both health care and non-health care experts), academically and politically independent and members have, in the past, provided consultation, education, research and resources in both Canada and abroad. None of the committee members declared a conflict of interest.

The Committee Members (in alphabetical order) are:

Dr. Joshua Bezanson	Emergency Physician Firefighter/EMT, Canmore Fire-Rescue Planning and Technical Info Specialist, Canada Task Force 2 HUSAR
Shawn Carby	Executive Director, Emergency Management Unit, BC Ministry of Health

Sharf Chowdhury	Emergency Management Coordinator Horizon Health Network New Brunswick, Canada
Robert Davidson	Commander/Special Operations, Ottawa Paramedic Service
Dr. Graham Dodd	Emergency Physician Associate, Department of Emergency Medicine, Royal Inland Hospital, Kamloops, BC Board member, Thompson Region Division of Family Practice Member, World Association of Disaster and Emergency Medicine
Dr. Vered Gazit	Staff Physician and Disaster Management Liaison Associate Professor, Emergency Department, Dalhousie University Division of Pediatric Emergency Medicine IWK Health Centre, Halifax, NS
Adrien Hansen-Taugher	Manager, Emergency Preparedness & Health Hazard, KFL&A Public Health

Max Hayman	Emergency Management Consultant, ICU Liaison, and First Responder Toronto, Ontario
Dr. Bonnie Henry	Medical Director, CD Prevention and Control Services and Public Health Emergency Services BC Centre for Disease Control and Associate Professor, School of Population and Public Health, University of British Columbia
Dr. Carl Jarvis	Emergency Physician, QEII HSC in Halifax, NS; Medical Director for Emergency Preparedness, EHS
Dr. Elene Khalil	Pediatrician, McGill University
Dr. Daniel Kollek	Emergency Physician and past Emergency Department Chief Associate Professor, McMaster University Honorary Senior Lecturer, Queen Mary University of London Chair, Disaster Committee, Can. Association of Emergency Physicians Director, Centre for Excellence in Emergency Preparedness Member DMSIG, IFEM
Sharron Lyons	President NENA Inc. RN, BC Children's Hospital
Troy McQuinn	Manager, Emergency Preparedness Ambulance New Brunswick
Dr. Brian Schwartz	Director of Emergency Management Support for the Ontario Agency for Health Protection and Promotion; Emergency Physician at Sunnybrook HSC; Senior Director of the Sunnybrook-Osler Centre for Prehospital Care; Co- the Base Hospital Program in regions of Peel, Halton, Simcoe, and District Muskoka, Toronto

Dr. Michelle Welsford	Associate Professor, Division of Emergency Medicine, Department of Medicine Chair of the Ontario Base Hospital Group Medical Advisory Committee Medical Director, Hamilton Health Sciences Centre for Paramedic Education & Research Staff Emergency Physician, Hamilton Health Sciences
Dr. Andrew Willmore	Emergency Physician Medical Director, Emergency Management, The Ottawa Hospital Associate Medical Director, Regional Paramedic Program for Eastern Ontario

References

- 1) Nuttall S, Tyler S. The crisis of September 11: the emergency response of Ontario hospitals and other health system partners. *Hosp Q* 2001;5:42-50.
- 2) Christian MD, Poutanen SM, Loutfy MR, Muller MP, Low DE. Severe acute respiratory syndrome. *Clin Infect Dis* 2004;38:1420-7.
- 3) A Canadian agency for public health: if not now, when? [editorial]. *CMAJ* 2003;169(8):741.
- 4) Berman MA, Lazar EJ. Hospital emergency preparedness -- lessons learned since Northridge. *N Engl J Med* 2003;348:1307-8.
- 5) Bevan D. SARS 3: Are we ready? [editorial]. *Clin Invest Med* 2003;26:273-4.
- 6) Schultz CH, Mothershead JL, Field M. Bioterrorism preparedness. I: The emergency department and hospital. *Emerg Med Clin North Am* 2002;20:437-55.
- 7) Federal/Provincial/Territorial Network on Emergency Preparedness and Response. National Framework for Health Emergency Management.
- 8) Christen H, Maniscalco P, Vickery A, Winslow F. An overview of incident management systems. Perspectives on Preparedness Series. Belfer Center for Science and International Affairs, Harvard University; 2001. Available: www.innovations.harvard.edu/showdoc.html?id=4915 (accessed 2005 Aug 5).
- 9) US Federal Emergency Management Agency (FEMA). National Incident Management System Training Manual. 2004. Available: www.fema.gov/nims/nims_training.shtm (accessed 2005 Aug 9).
- 10) Aghababian RV, Teuscher J. Infectious diseases following major disasters. *Ann Emerg Med* 1992;21:362-7.
- 11) Binder S, Sanderson LM. The role of the epidemiologist in natural disasters. *Ann Emerg Med* 1987;16:1081-4.
- 12) Public Health Preparedness and Response Capacity Inventory. US Centers for Disease Control and Prevention, Public Health Practice Program Office (PHPPPO). 2004. Available: www.bt.cdc.gov/planning/ (accessed 2005 Aug 16).
- 13) "Canadian ED preparedness for a nuclear, biological or chemical event" *CJEM*, January 2003, Vol 5 No 1 pps 18-26
- 14) "Chemical, biological, radiological and nuclear preparedness training for emergency medical providers" Kollek D, Welsford M, Wanger K, *CJEM* July 2009 Vol:11 No:4
- 15) "Hospital Emergency Readiness Overview (HERO) Study" (abstract) Kollek D, Cwinn A.A. *Prehospital & Disaster Medicine* 2009;24:2.s50.
- 16) "Canadian Prehospital Readiness for a Tactical Violence Event" Kollek D, Wanger K. Welsford M. *Prehospital & Disaster Medicine* 2010;25(2):
- 17) Dodd, G.A.A. (2010), Master's Dissertation, Master's of Arts, Disaster & Emergency Management, Royal Roads University. "Exploring the Role of Physicians in Disaster and Emergency Management: What the H1N1 Has Taught Us".
- 18) Personal communications Emergency Management Coordinator - Horizon Health Network, New Brunswick, Canada
- 19) Sauer, Lauren M., McCarthy, Melissa L., Knebel, Ann, Brewster, Peter, Major "Influences on Hospital Emergency Management and Disaster Preparedness" *Disaster Medicine And Public Health Preparedness* 2009 3: S68-73