

Code Red: Towards Transformational Leadership of Emergency Management Systems

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Abstract

The 21st century events will undoubtedly require attention to the leadership challenges of emergency management systems. Based on a grounded theory approach, this qualitative study reports on key informant analysis of the perspectives of leading professionals in emergency management across Canada. The emerging model points to the importance of eight specific attributes of transformational leadership in the context of emergency management and suggests that contextualization of health leadership is of particular import.

Introduction

In the 21st Century emergency management systems will require transformational leadership of an order not yet fully potentiated in Canada. The extant literature is replete with cases analyses of leadership challenges in a wide range of critical events that include emergencies, disasters and catastrophes.¹⁻¹⁹ These events are integrated along a magnitudinal continuum from emergencies that are small-scale, common and manageable with regional resources; disasters that typically involve more than ten deaths and/or 100 injuries requiring multi-regional response collaboration; and catastrophes that exact total destruction of critical community infrastructures necessitating national and international interventions. The extant literature underscores the need for effective emergency leadership in prevention; emergency preparedness; emergency response and medical care; social recovery and rehabilitation; and adaptive learning- all of which are crucial in saving lives, mitigating injuries and maintaining communal integrity.²⁰⁻³⁷ The 21st century brings a sense of great urgency in recognizing and addressing diverse emergency management challenges through transformational leadership.

Methods

This qualitative study explores the phenomenology of emergency management leadership, using grounded theory methodology.³⁸⁻³⁹ The study sought to elicit the individual perceptions and perspectives of emergency, governance, health and technological professionals through key informant analysis.⁴⁰⁻⁴⁵ As with qualitative studies of human subjects, the study objectives, protocol and research instrument required prior review and approval of an institutional research ethics board. Purposive selective and chain referral sampling were deployed to elicit relevant key informant responses within a six-week response time limit. Professional bodies, including the Canadian Association of Fire Chiefs, the Canadian Association of Social Workers, the Canadian College of Health Leaders and the Canadian Information Processing Society, were points of entry that consented to issue a general invitation to their membership to participate in the study. The key informant recruitment strategy was totally voluntary and confidential, as were the responses. Upon affirming their willingness to participate directly, experienced professionals in emergency management were sent a link to a confidential semi-structured questionnaire in a secured database under the researcher's name with a reputable online cloud-based company. The privacy and confidentiality standards were detailed and required that each respondent sign an explicit consent statement. Only then were they given the option to either complete the questionnaire online, or request to have the exact same instrument completed through a teleconference with the researcher. Once they stated their preference, the key informants had access to and could proceed with the completion of 26 semi-structured questions that focused on their perceptions of emergency experiences, system performance, threats, emergency preparedness, technological developments, private sector partnerships and leadership. Given the open-ended nature of the questionnaire, these professionals responded with and elaborated on textual data descriptions of perceived systemic challenges. Evoked responses were meaningful and particularly salient to each key informant producing an array of results that was rich, explanatory and sometimes unanticipated. A total of 103 key informants were sent invitations to participate and complete the research instrument online or, as in seven cases, through a teleconference with the researcher within the six week limit. Seventeen online questionnaires had negligible responses and were dropped from the study. The response rate was 83.5 percent with 86 key informants, representing 76 organizations as in Table 1. Of the total respondents, 89 percent were senior professionals with 10 or more years of experience. Moreover there were 28 health professionals, 15 government officials, 14 fire and rescue officers, 11 care providers; 10 military officers; 4 social workers and 4 information system professionals—all with relevant emergency management experience. Consonant with the grounded theory methodology, qualitative data was collected and repetitive concepts and elements were tagged through a process of substantive coding. Theoretical memoing and comparative analysis of the textual data of key informants followed. What emerged was a central thematic model of transformational leadership, around which evoked concepts matched with textual data in ways that were relevant and reflective of the substantive views of key informants. Moreover, eight specific attributes of such leadership were validated in the context of this domain through this qualitative study.

PLACE TABLE 1 HERE

Key Findings

In the process of theoretical memoing, three interrelated significant constructs emerged from key informant analysis.

1. Experiential and perceived emergency threats and performance

Table 2 summarizes five categories of threats that constitute potentially significant emergencies; highlights the experiences of 46 respondents and identifies the perceived future threats. Seventy-eight percent of respondents reported that business continuity, emergency preparedness and/ or disaster recovery plans were in place in their organizations. Twenty-two percent reported had none. Performance management is predicated on emergency efficiency (response, transport and discharge rates) and effectiveness (mortality, morbidity, recovery, professional burnout and patient/family satisfaction rates). Key informants reported that the emergency care response systems were largely efficient, even if there were no survivors due to the catastrophic nature of the event. Two key informants noted that despite excellent emergency response and care provided, care providers suffered from burnout and post-traumatic stress disorder, for which there was little recognition of nor support for.

PLACE TABLE 2 HERE

2. Perceived technological innovations and diffusion

The key informants underscored the need for technological innovations and deployment in emergency management. Advanced transportation and information technologies, such as drones and driverless vehicles, autonomic computers, nanotechnology, robotics, tele-medicine and ubiquitous sensor technologies, were deemed as having great potential to save lives and decrease injuries in the future. This optimism was tempered with the realization that the deployment of innovations in emergency management would be diffuse and inexorably slow in the light of sociopolitical and financial realities in Canada. The lagging progress towards common systems interoperability standards was one a case in point that underscored that sociopolitical issues at hand. Nor were any key informants hopeful that partnerships with the private information technological sector would be instrumental in the diffusion of innovative technologies. Respondents maintained that entrenched differences in mission, perceptions and values between the private and public sectors militated against any possibility of long-term cogent and stable partnerships. However, they did think that proactive engagement and collaboration of private sector stakeholders was critical in three areas: supply chain management networks; regional and national emergency preparedness coordination; and marketing of technological innovations.

3. Perceived transformational leadership

Key informants emphasized the importance and need of effective leadership in emergency management systems. They stressed such leadership included relevant expertise and knowledge within legal and sociopolitical contexts; cognitive abilities, such as systems thinking, proclivity to innovation and analytical skills in complex and uncertain conditions; personality traits; political skills that would facilitate inter-professional network building, negotiation, perspicacity and conflict resolution; social competencies that inspire trust and respect, motivation and professionalism; and value attributes such as service ethics, empathy and personal integrity) –all confirming the extant literature on leadership.⁴⁶⁻⁴⁹ Moreover, respondents emphasized the need for decisiveness under conditions of extreme stress and uncertainty, adaptability, courage, equanimity and tenacity. Situational and self-awareness of personal limitations and the ability to delegate authority were deemed important. Notably key informants consistently underscored the need for Federal governance authorities to assume accountability and due responsibility for performance outcomes; promoting cogent and proactive dialogue and positive actions and, in so doing, exercise leadership in emergency management systems.

Transformational Leadership Attributes in Emergency Management

Transformational leaders engage and motivate professionals and communities to integrate their vital efforts leading to improved systemic improvements in emergency management. The key findings of this qualitative study point to eight attributes of transformational leadership that are contextual and specific to emergency management systems.

1. Strategic cognition. Transformational leaders must be able to think the “unthinkable”. Emergencies incubate silently and mask dangerous warning signals, latent problems and potential failures. Denial of red flags of smoldering crises continues to be one of the greatest emergency leadership challenges and remains political and psychological by nature. The consequences are manifold and include shock, disbelief, paralysis, panic, disregard, inappropriate and delayed responses and chaos that often prove disastrous for individuals, organizations and communities. Emergency events challenge set beliefs, expectations and sensory perceptions of reality and alter the normalized view of ordered entities of reality, convoluting them into the “unthinkable”. To be effective transformational leaders require strategic cognition aptitudes to withstand shock, as well as sensory and information overload in critical events.

2. Environmental perception. Transformational leaders must remain astute and constantly vigilant to a dynamic set of threats, risks and vulnerabilities that trigger emergency events. Such leaders also recognize that threats often compound and escalate into new risks and threats. Environmental scanning and monitoring, situational awareness, risk assessment and resource analysis must be continuous. Mitigating risks through the strengthening of public safety legislation and regulations; judicious land zone planning; closing socio-economic gaps; health promotion; emergency preparedness; well-resourced medical response, care and recovery systems; community resilience and strengthening of critical emergency infrastructures are important outcomes of effective environmental perception.

3. Strategic potentiation. Transformational leaders must forge dynamic collaborative networks between diverse professional communities in emergency management. The survivability of individuals and viability of organizations and communities ultimately depend on the diversity, strength and vitality of stakeholder engagement. Emergency first-responders, public safety professionals, care providers, governance authorities, community groups, the defence sector, non-governmental organizations and the private sector must all be proactively involved in the evolution of emergency management systems. Synergistic collaborative networks built through positive dialogue, understanding and trust enhance community resilience and system performance. This happens when transformational leaders potentiate, motivate and coalesce the diversity of stakeholders towards the singular mission of emergency management.

4. Social value engagement. Transformational leaders must engage individuals, organizations and communities in emergency preparedness and service to others as a recognized social value and responsibility. This remains the vital core of planning and the praxis of emergency management. Without effective business continuity, emergency response and recovery plans, individuals, organizations, and communities are far less able to respond to, cope with and fully recover from emergency events. Emergency preparedness is not just the domain of the trained emergency professionals and governance bodies, but central to the mission and integrity of all organizations and communities. Engaging and creating social consciousness and motivation to serve others enhances community resilience. Emergency system performance depends on the integration of emergency preparedness and the ethos of service to others as a social value in the body politic. Transformational leaders have a responsibility to articulate, inspire and engage others in this social mission.

5. Strategic engineering. Transformational leaders must strive to create high reliability systems through systems engineering in the emergency management domain. Adaptive learning and commitment to continuous systems improvement are the hallmarks of high-reliability organizations. Moreover, such organizations are forged through effective critical telecommunications infrastructures built on universality and commonality in system standards, policies and operations. Systems interoperability remains the sine qua non of information, knowledge and resource sharing in the emergency management domain. Systems engineering techniques, such as benchmarking, Kaizen (continuous improvement) techniques, lean

methodologies, root cause analysis, simulations and total quality management are germane to high-reliability organizations and form an important knowledge base and skill set for transformational leaders.

6. Logistical strategizing. Transformational leaders must strategize logistically to assure access to effective supply chain networks regionally, nationally and internationally before emergency events occur. Deploying vital emergency personnel, resources and supplies in situ efficiently and effectively to emergency events is of paramount importance, yet remains the Achilles heel of in many emergency situations. Forging cogent supply linkages with suppliers in the private sector, the defence sector, communities, governance, and non-governmental agencies are as vital, as are maintaining secure critical communication and transportation infrastructures.

7. Innovative transformation. Transformational leaders must advocate, create roadmaps and lead transformative changes associated with innovative technology deployments. The potential of technological innovations to revolutionize emergency management practices is massive. Such innovations include global satellite tracking systems, autonomic and intelligent systems, big-data systems, cloud-computing, driverless vehicles, drone technology, holography, intelligent grid technologies, nanotechnology, robotics, simulation systems, telemedicine, tele-surgery, and virtual incident command centers. Leaders must be astute to the need for and power of technological innovations and have capabilities in change management to effect positive outcomes in emergency management systems.

8. Intuitive foresight. Foresight with a compelling vision that inspires and motivates others are hallmarks of transformational leaders. Leaders must have an intuitive understanding of the interrelatedness of environments, emergency events and responses and possess powerful insights into complex human and socio-political behaviour in the face of seemingly insurmountable challenges. Empathy and compassion must inform and drive that vision. With the humility to recognize that the forces at work may at times be beyond comprehension and control, leaders must still persevere in that vision and inspire others in the continuous struggle of “the human condition”.⁵⁰

Conclusion

The contextualization of transformational leadership is potent area of leadership research.⁵¹ Mass emergencies, disasters and catastrophes will undoubtedly increase during the 21st century in the face of burgeoning populations in regions exposed to growing threats in vulnerable environments. The results of this qualitative study with its grounded theory approach underscore the importance for transformational leadership and identify eight specific attributes that are contextual in the emergency management domain. Transformational leadership requires high-order skill sets that include strategic cognition, environmental perception, strategic potentiation, social value engagement, strategic engineering, logistical strategizing, innovative transformation and intuitive foresight. Moreover, this study underscores the relevance of contextualization as a means to isolate specific leadership attributes, thus opening the door to other such qualitative leadership studies in diverse public health domains, including chronic and infectious diseases and mental health. Potential action plans for effective transformational leadership in the emergency management domain point to a panoply of possibilities, including knowledge diffusion, where universities and professional colleges deliver emergency management studies, focused training, workshops and self-learning programs for emergency leadership in Canada and internationally. Professional mentoring of potential leaders is another. Identifying, encouraging and mentoring future leaders early in their professional careers. Sectors such as those in the academic, defence, governance and technology worlds have responsibilities to innovate and diffuse appropriate technological innovations in this domain. Federal governance leadership is also indicated to foster productive dialogue and proactive action plans in light of highly-probable mass emergencies, disasters and catastrophes that threaten lives and communities in Canada. One nexus of possible national action is the potential need for effective civil defence systems, comparable to those in Denmark, France, Sweden and Switzerland, given the emerging realities of global 21st Century. Moreover, the Federal Government is in a prime strategic position to foster emergency coalitions, mutual aid agreements and harmonization of emergency management infrastructures with NAFTA and NATO nations. Furthermore, as part of its global humanitarian responsibilities, Canada is morally bound to assist the international community in the construction of effective emergency critical infrastructures, particularly those in nations with significant vulnerabilities. All of these proposed actions require the exercise of transformational leadership. Finally, this qualitative study also suggests that transformational leadership may be triggered through experiential catalysts and shocks that compel the exercise of that leadership in specific contexts. The actualization and contextualization of such leadership remains a titanic and promising area for future research.

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Table 1: Summary of key informants and their organizations

*Aboriginal Affairs and Northern Development Canada
Alberta Health Services, Edmonton, Alberta
Alberta Investment Management Company, Edmonton, Alberta
Ambulance New Brunswick, Moncton, New Brunswick
AMITA Corporation, Ottawa, Ontario
*Arnprior and District Memorial Hospital, Arnprior, Ontario
BC Cancer Agency, Vancouver, British Columbia
Bell Canada, Ottawa, Ontario
Brant County Fire Department, Paris, Ontario
Businesstech Consulting , London, Ontario
Calgary Fire Department, Calgary Alberta
Canadian Association of Fire Chiefs, Ottawa, Ontario
Canadian Blood Services, Ottawa, Ontario
Canadian Coast Guard, Gatineau, Quebec
Canadian College of Health Leaders, Ottawa, Ontario
Canadian Forces Health Services Centre, Cold Lake, Alberta
Canadian Forces Health Services Group, Ottawa , Ontario
Canadian Forces Military Police, Ottawa, Ontario
Central Ambulance Communications Centre, London, Ontario
Central West Local Health Integration Network (LHIN), Brampton, Ontario
Centre for Emergency Preparedness and Response, Ottawa, Ontario
CGI, Ottawa, Ontario
Children's Hospital of Eastern Ontario, Ottawa, Ontario
City of Calgary
City of Ottawa
Collingwood Fire Department, Collingwood, Ontario
Corner Brook Fire Department, Corner Brook, Newfoundland and Labrador
Department of Fisheries and Oceans, Ottawa, Ontario
Emergency Health Services, London, Ontario
Emergency Management and Public Safety Institute (formerly Canadian Centre for Emergency Preparedness),Toronto, Ontario
Emergency Management Ontario, Toronto, Ontario
e-Privacy Management Systems Inc., Lakefield, Ontario
Florida Department of Management Services, Tallahassee, Florida
*Foresight Canada
Fort Erie Fire Services, Fort Erie, Ontario
Fraser Health Authority, Surrey, British Columbia
Grey Bruce Health Services, Owen Sound, Ontario
Heart and Stroke Foundation of Canada, Ottawa, Ontario
Highlander Counselling and Mediation, Edmonton, Alberta
Humber Institute of Advanced Learning and Technology, Toronto, Ontario
*IBM (Oracle), Ottawa, Ontario
IBM, Oakville, Ontario
Industry Canada, Ottawa, Ontario
*International Association of Emergency Managers
J. Garrow & Associates, Ottawa, Ontario
KPMG, Toronto, Ontario
Lakeview Manor, Durham Ontario
Lansdowne Children's Centre, Brantford, Ontario
London Health Sciences Centre, London, Ontario
McGill Health Network, Montreal, Quebec
Ministry of Community Safety and Correctional Services, Toronto, Ontario
*Office of the Chief Coroner, Ministry of Community Safety and Correctional Services, Toronto, Ontario
National Defence and the Canadian Armed Forces, Ottawa ,Ontario
National Office of Health Emergency Response, Public Health Agency of Canada, Ottawa, Ontario
North York General Hospital, Toronto, Ontario
Nova Scotia Department of Community Services, Halifax, Nova Scotia
Office of Emergency Management, Plano, Texas
Ontario College of Family Physicians, Toronto, Ontario
Ontario Ministry of Health and Long Term Care, Toronto, Ontario
Pacific Region, Canadian Coast Guard, Victoria, British Columbia
Princess Margaret Hospital, Toronto, Ontario
Public Health Agency of Canada, Ottawa, Ontario
*Public Safety Canada, Ottawa, Ontario
Quinte Health Care, Belleville, Ontario
R. Scott Rowand & Associates Inc., Toronto, Ontario
Regina Fire and Protective Services, Regina, Saskatchewan
Richmond Fire and Rescue, Richmond, British Columbia

Royal Canadian Air Force, Kingston, Ontario
Sarnia Fire and Rescue Services, Sarnia, Ontario
Southeast Local Health Integration Network (LHIN), Belleville, Ontario
St. Michael's Hospital, Toronto, Ontario
Sudbury Regional Hospital, Sudbury, Ontario
Surrey Fire Service, Surrey, British Columbia
Thunder Bay Fire and Rescue, Thunder Bay, Ontario
Trillium Health Centre, Mississauga, Ontario
Vancouver Coastal Health, Vancouver, British Columbia
Vancouver Health Services Authority, Vancouver, British Columbia
Vancouver Island Health Authority, Victoria, British Columbia
Verras Canada Ltd., Toronto, Ontario
VHA Home Health Care, Toronto, Ontario
Waterloo-Wellington Local Health Integration Network (LHIN), Kitchener, Ontario

** Questionnaire administered through teleconference at key informant request.*

Table 2: Summary of key informant emergency experiences and perceptions of threats

Threat categories	Threat examples	Key informant emergency experiences	Key informant perceived threats (%)
Biological	<ul style="list-style-type: none"> Biological agents and attacks Cardiovascular emergencies Epidemics and pandemics Food and/or water contamination Food and/or water shortages Immunity to antibiotics Infectious diseases Pandemic Psychiatric disorders Sports injuries and falls Suicidal ideation and behaviors 	<ul style="list-style-type: none"> ➤ Cardiovascular emergencies. ➤ Suicidal crisis intervention. ➤ H1N1 epidemic. ➤ Public venue suicide. ➤ SARS outbreak. ➤ Sudden deaths on public venues. 	26%
Meteorological	<ul style="list-style-type: none"> Blizzards Heat emergencies Hurricanes Ice storms Tornados Wind storms 	<ul style="list-style-type: none"> ➤ Hurricane Katrina restoration. ➤ Tornados touchdown points in rural Ontario. 	15%
Sociogenic	<ul style="list-style-type: none"> Border emergencies and shutdowns Collapse of public health and safety systems Criminal violence Cyberattacks Explosive devices Homicides Gang and tribal conflicts International conflicts Infrastructural damage, disruption and failure Mass violence Terrorist violence Social unrest and anarchy 	<ul style="list-style-type: none"> ➤ 911 command center operation in Manitoba. ➤ G8 and G10 emergency operations. ➤ Crisis intervention of a person with suicide ideation. ➤ Family homicidal incident. ➤ Suicide bomber in hospital emergency unit ➤ Olympics 2010 emergency preparation. ➤ War injuries and casualties in Afghanistan. ➤ Public venue suicide. 	18%

Technological	<p>Airline accidents Bleves, conflagrations and firestorms Chemical and gas explosions Electrical grid failures Environmental accidents Facility and plant fires Hazards materials (HAZMAT) accidents Home and farm accidents Industrial and workplace accidents Infrastructure collapse Loss of energy, power and water resources Marine accidents and disasters Motor vehicle accidents (MVA) Nuclear accidents Oil and toxic spills Pedestrian accidents Rail accidents Space accidents Recreational/sports accidents Structural accidents Transportation accidents</p>	<ul style="list-style-type: none"> ➤ Abandoned plant fire and toxic fumes plume ➤ Bicycle/MVA collision ➤ Bus accident with pediatric emergencies. ➤ Bus/semi-tractor trailer collision ➤ CBRNe team response to ammonia leak ➤ Chemical explosion and conflagration. ➤ Chemical recycling plant explosion and conflagration. ➤ Collapse of a safety rail at public event in Ontario. ➤ Commercial building fire. ➤ Ferry boat sinking in British Columbia. ➤ Hospital fires. ➤ Motorcycle collisions. ➤ Multi-automobile collisions. ➤ Oil refinery explosion and conflagration ➤ Pedestrian/automobile collision. ➤ Pediatric MVA ➤ Rail transport with hazardous chemicals/MVA collision. ➤ Recreational burn accident. ➤ Residential complex fire. ➤ Residential house fires. ➤ Rural All-Terrain Vehicle (ATV) accident. ➤ Small aircraft crash Ontario. ➤ Swiss Air 111 tragedy. ➤ Train/pediatric accident. ➤ Transport truck tumbles off a bridge into a dry river bed. 	29%
Topological	<p>Droughts and water shortages Earthquakes Catastrophic floods Forest and grassland fires Landslides and sinkholes Sinkholes Space weather (solar flares) Tsunamis</p>	<ul style="list-style-type: none"> ➤ Catastrophic flooding in Manitoba. ➤ Earthquake disaster Haiti. ➤ Forest wildfires of British Columbia. ➤ Hurricane Katrina. ➤ Tornado in rural Ontario. 	12%