The Changing Landscape of Health Emergency Management

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ABSTRACT

In the 21st century, there are several different factors leading to an increased risk of crises, often with trans-boundary effects: increased population, an aging population, emerging infectious diseases and antibiotic resistance, and increased international travel and mobility. Exacerbated by climate change and urbanization, the mounting intensity, frequency and diversity of natural hazards worldwide has been resulting in significant negative impact on all people’s health globally. Yet, the declining ecosystem health emerges as the greatest risk to our health, in particular for vulnerable populations. It is well documented that global burden of disease is disproportionately higher in low-middle-income-countries (LMICs) than in high-income countries (HICs), but inequities also exist within HICs, where vulnerable populations have significantly worse health outcomes than the larger population. Interactions between the social, economic and political spheres among others shape the social determinants in the urban setting, resulting in unique health outcomes and associated interventions. Without targeted interventions, health inequities are likely to continue to grow both globally and within high-income countries like Canada. Fortunately, health emergency management bolstered by good governance has the potential to help mitigate the detrimental effects of urbanization and globalization. We can start by addressing key factors such as climate-change related challenges, and with the support of social processes, healthier, equitable and sustainable communities can be achieved. Public health plays a critical role in developing and sustaining a broad approach to emergency management, encompassing prevention, mitigation, preparedness, as well as response and recovery services. Through intersectoral and interagency collaboration, health emergency management initiatives can overcome a variety of barriers to reduce current health inequities and prevent further divides.
private sector (Burgess, 2007).

Much of the world’s developing nations have populations largely below the poverty line, with poor infrastructure, minimal disaster surge capacity and weak public health systems; these populations are the most vulnerable to climate change and extreme weather patterns. Therefore, developing cities worldwide are at an especially high risk for deaths, diseases, disabilities and other health impacts that act as barriers to the progress of global health goals (“Emergency Risk”, 2013).

While it is well documented that global burden of disease is disproportionately higher in low-middle-income-countries (LMICs) than in high-income countries (HICs), inequities also exist within HICs, where vulnerable populations have significantly worse health outcomes than the larger population (Patz et al., 2007). Within Canada, these disparities exist between the health of the lower and mid to high socio-economic populations. These differences cannot be attributed to a single factor – across the board people of lower socio-economic status have higher rates of health burden – but some have larger margins. Compounding this, there is also a large body of evidence to demonstrate that disasters particularly affect the poorest and most marginalized people, all the while exacerbating vulnerabilities and inequalities (PreventionWeb, 2015).

Considering the emerging risks and existing inequities, this paper aims to address the changing landscape of health emergency management in Canada and beyond by identifying risk factors associated with specific negative health outcomes linked to emergent events, and the possible implementation of effective and targeted interventions through public health. Ultimately, recognizing that inequitable differences are preventable has a huge effect on policy recommendations; whether these are accepted or instated is another (largely political / economical) issue.

**Principles and Practice**

Crisis involve high levels of uncertainty, and are not managed by a mere increase in support services (Siebold, 2006). They require communication between many different actors and quick delegation of action. As it stands, large-scale disasters often overwhelm response capacities of the health care sector and beyond (Siebold, 2006). The scale of a disaster is a major factor in predicting an effective response: as no two disasters are similar, organizations cannot practically plan for all types of disasters (Siebold, 2006). However, there are common elements to all disasters, and preparing for these can significantly increase preparedness. Several factors that increase preparedness include developing a comprehensive emergency response plan; instating a well-articulated incident management system; supporting collaboration, coordination and open communication among community agencies and all levels of government; and providing education and training initiatives (Siebold, 2006).

On the other hand, traditional models and practices that focus on response and recovery often hinder efforts to implement lessons learnt and good practices. Fears of post-event economic losses and poor political ratings spur market growth, often hastily reconstructing a poor foundation with many fault lines (Siebold, 2006). In fact, the cost of downstream emergency practices are often more costly than upstream approaches, and the presence of disaster loss and damage is often an indicator of failed
development, unsustainable economic and social processes, and of ill-adapted societies (PreventionWeb, 2015). In light of this, the Hyogo Framework and the following Sendai Framework reflect a global shift away from disaster management and toward disaster risk management (PreventionWeb, 2015). Similarly, the focus of health emergency management should continue to be rerouted from response and recovery to prevention by means of resilient infrastructure through sound urban planning and health emergency management initiatives. The ability to understand, analyze and address the emerging risks to populations affected by emergent events is critical to foster health gains rather just mitigate the new concerns.

Risk Management

Disasters are an indicator of development failures, meaning disaster risk is a measure of sustainability of development, which can be affected by several risk drivers, including poverty and health inequities, rapid urbanization, climate change, and environmental degradation (PreventionWeb, 2015). It is important to understand “disaster risk requires us to not only consider the hazard, our exposure and vulnerability but also society's capacity to protect itself from disasters” (PreventionWeb, 2015).

Risk management can incorporate prevention policies and mitigation programs to reduce exposure and vulnerability through economic arguments to invest more in disaster risk reduction, resulting in a net gain of recovery versus response costs (Bosher, 2006). This preventive approach includes protective infrastructure, early warning systems, regulations on land use, and building codes, ultimately creating a resilient framework that equips a system, community or society with the ability to resist, absorb, accommodate and recover from hazards in a timely and efficient manner (Bosher, 2006). Resiliency also entails continuity of services, increasing capacity and reducing losses of production (Bosher, 2006). In this respect, governments play a crucial role in strengthening the resiliency of their communities and critical infrastructure networks. Furthermore, governments must maintain transparent and accountable crisis management all the while providing robust leadership (Bosher, 2006). To foster this development, government policies should support the “exchange of practice and experience to better deliver this fundamental role in an evolving context of trans-boundary risks” (p. 9), especially in the critical hubs of the global economy (Bosher, 2006).

Accordingly, pre-crisis planning is the most important stage of health emergency management. During this time, it is essential to identify resources, develop training plans, foster alliances with stakeholders, and develop and test communication systems (CDC, 2014). Crisis management policies and practices should focus on key public governance issues inclusive of overall crisis governance framework, establishing the role of science and expertise and clear leadership. Such governance would also include the monitoring of networks, and facilitating international cooperation. Importantly, initiatives should aim to establish a network of crisis management to exchange practices and encourage conversation (Baubion, 2013).

Efforts to mitigate the harmful effects associated with emergencies will benefit from a proactive approach that encompasses health promotion, health protection, and personal health services,
increases community and country capacities, and supports resiliency in health systems ("Emergency Risk", 2013). Strategic planning should involve innovative development through comprehensive emergency response plans, prevention measures, incident management systems, and education and training initiatives (Siebold, 2006).

The Role of Evidence

Health emergency management as an emerging field means that effective strategies are not yet standardized and that evidence is somewhat limited (Siebold, 2006). The field itself is evolving to meet the new demands of emergency management, but the inconsistencies in terminology and concepts hinder comprehensive research and evaluation methods (Siebold, 2006). Other barriers to evidence include difficulties quantifying issues and breaking down concepts into workable scientific questions and solutions (Siebold, 2006).

As public health defines its role in health emergency management, identifying best practices is crucial, as is defining the relationships between health care actors and non-health care actors (Lynch & Cox, 2006). By moving away from anecdotal evidence, performance indicators can be identified to compare with benchmarks to develop quality management. With evidence, governance and accountability mechanisms can be developed to ensure the environment is professionally managed (Lynch & Cox, 2006).

A variety of models of emergency management exist internationally, but there is no one system identified as optimal (Lee, Phillips, Challen & Goodacre, 2012). While evidence helps remove uncertainty, ideology, values, and principles affect what is accepted as valid information. Facts and values, personal experiences, and anecdotal evidence interact with information in such a way that affects what is considered credible, and what is implemented in practice. Therefore, the precautionary principle as an overarching concept should be practiced in the meantime - not only for prevention, but to manage and mitigate risk (Martuzzi, 2007).

Key Issues and Challenges

The 21st century has already observed an increasing frequency of damaging and costly shocks, and forecasts continue to show increased risks (Baubion, 2013). Societies are becoming increasingly vulnerable as unprecedented threats have potential to cause amplifier effects. The key macro drivers that reinforce vulnerability extend beyond the obvious risk factors: the infrastructure of globalization is founded on an interdependence of production and delivery systems, with supply chains and vital services networks more exposed to disruption. If one facet of the system is disrupted, it can cause system-wide collapse and subsequent cascading and trans-boundary effects, where an inevitable and sometimes unforeseen chain of events occur due to an act affecting a system (Baubion, 2013).

Rapid urbanization has resulted in a large portion of the world living in a built environment. The most rapid growth of urban areas is in the less wealthy regions of the world (namely, Africa and Asia),
and is projected to increase. A large portion of this is expected to be slums, which lack in essential services such as water, housing, security, and safety (Baubion, 2013). The global marketplace has contributed to this rapid expansion, creating urban dwellings that leave the government scrambling to provide essential infrastructures and services. This results in poorly planned built environments and leaves populations vulnerable to the effects of extreme weather events related to climate change. Subsequently, urbanization and concentration of populations and assets has resulted in vulnerable – and targeted – zones with potential for sizable losses (Baubion, 2013). If these current global patterns of increasing exposure through rapid urban development and environment degradation grow, then “disaster risk may increase to dangerous levels” (PreventionWeb, 2015).

Ethics

The negative health impacts of climate change can largely be associated with globalization, and more increasingly, trade and investment liberalization. Both processes disproportionately benefit larger and wealthier nations, increasing inequities and income gaps between HICs and LMICs (Labonte, 2015, p. 199).

Regions experiencing the greatest increase in climate-related diseases and events are the communities that are the least responsible for the increase in greenhouse gas emissions (GGE). Worst, those most affected (88% of the disease burden) are children under five, outlining an obvious ethical concern. Ultimately, developed countries are disproportionately responsible for GGE, yet the regions receiving the brunt of industrialized nations’ actions, namely developing nations, do not have adequate means for mitigation (Patz et al., 2007).

Patz et al. (2007) argue the ethical considerations of these existing climate change health inequities, highlighting the unequal global distribution of responsibility and health impacts. The authors call for equitable health impact assessments of risks and solutions to effectively quantify the emerging crisis, as well as to ensure future initiatives are ethical and prevent further health inequities. Within this framework, it is argued that GGE should be “based on every person’s equal right the ‘atmospheric commons’” (i.e. common ownership of the deep sea) to protect the well-being of the global population, and draw upon robust quantitative evidence to suggest developed nations are disproportionately responsible for climate related health risks, while the poorest nations who have the least capacity to adapt are the most affected (Patz et al., 2007).

Despite current emissions, developing countries simply have not emitted GGE at a significant rate long enough to attribute responsibility to the natural assimilative capacity of the atmosphere. Currently, developed nations support fossil fuels through $450 billion on tax breaks, subsidies, and policy – but provide only $5 billion of the estimated $150 billion required to help developing nations adapt to climate change, directly caused by this industry (Oxfam, 2015). The WHO attributes 2.4 million premature deaths per annum to air pollution, primarily from combustion sources, demonstrating an unprecedented risk and one of the largest health inequities of this century (2007, p. 402).

While the principal argument is ethical in nature, there are several other compelling facets of
this approach. First, environmental changes have already challenged the health and economy of many nations, and are part of an increasing global trend; second, rural and underserved communities are the most vulnerable to these risks, exacerbating present non-climatic inequities; and third, current regional differences will become less distinct because of globalization (Patz et al., 2007). Efforts to protect vulnerable population groups not only serve ethical purposes, but also facilitate economic growth and development, thereby decreasing regional inequities and supporting the global market (Patz et al., 2007).

**Economic effects**

The emerging types of crises in the era of globalization are unique in that they extend beyond national borders, and cause significant economic effects. The interconnected nature of the global economy has created a new vulnerability to systemic shocks. Secondary, or cascading, effects of these shocks can create barriers to economic recovery, social cohesion, and political stability (Baubion, 2013). Various levels of the government are responsible to mitigate the damage from these cascading effects and prevent economic fall out, but the complex nature of cross-boundary crises often require many actors outside emergency services, requiring effective co-ordination between government bodies, NGOs, and non-profit organizations (Baubion, 2013).

With the increasing rate of climate-related disasters and extreme weather conditions, attention has been brought to the impending financial cost of climate change. Flood losses in the US from the year 2005 are estimated to be US$6 billion. By mid-century, it is estimated that this number will increase to US$52 billion (Hallegatte & Nicholls, 2013). Flooding estimates vary, but even conservative numbers pose many risks, especially to port cities. The startling news means millions more people are at risk of suffering unprecedented damages from flooding caused by future storms.

Of particular concern is the rising sea level. More than half of the US population, consisting of over 285 cities, live less than one meter above the high tide mark. Aside from disruptions to operations, damage to infrastructure can compound threats to the immediate environment (Hallegatte & Nicholls, 2013). Combined with poor public health standards and large at-risk populations, developing cities are at high risk for loss of life and widespread damage. Accordingly, the relationship between industrialization and climate change is risky and proper monitoring should be instated (Prüss-Üstün & Corvalán, 2006).

**Health Emergency Management Infrastructure**

**Environment**

The environment provides us with the ecological determinants of health that essentially determine whether we thrive or fail, making it our ultimate determinant of health. In the last two centuries, public health was born and defined by the myriad of threats to humans from the environment.
With the transformation from agrarian to urban and industrial, through driving forces such as globalization and urbanization, there are increasing threats to the environment – and thereby to us. In combination with climate change, these forces are contributing to an unprecedented frequency and scale of crises, with trans-boundary and cascading effects from natural, biological, technological and societal hazards (Baubion, 2013).

The social determinants of health are influenced at proximal (immediate environmental risk), intermediate (occupational groups at increased risk) and distal (possible underlying environmental risks) levels (Prüss-Üstün & Corvalán, 2006). While urbanization poses many threats, the health of natural ecosystems is the prevailing natural determinant of health. Some populations are more vulnerable to specific determinants than others: the health disparities that are created through this interplay are not homogenous and interact in diverse contexts. What is apparent in the social determinants of health is the interplay on each other - no one determinant stands alone. Within this interaction, the environment plays a major role and stands to be the most influential determinant of health (Prüss-Üstün & Corvalán, 2006).

The environment encompasses the social, natural, cultural and physical surroundings that are external to the human host; the modifiable environment is more acutely the physical, chemical, and biological factors, as well as behaviours related to the environment (Prüss-Üstün & Corvalán, 2006). For the purposes of public health interventions, the WHO has reduced this definition to “those parts of the environment that can be modified by short-term or longer-term interventions, to reduce the health impact of the environment” (Prüss-Üstün & Corvalán, 2006, p.22).

Approximately one quarter of the global disease burden is attributed to modifiable environmental factors. This portion increases to one-third of the disease burden among children. Annually, this accounts for four million environment-caused child deaths per year. This ‘environmentally-mediated’ disease burden is much larger in the developing world, but high rates of non-communicable diseases are observed in developed countries as well (Prüss-Üstün & Corvalán, 2006). Expanding knowledge and awareness of environment-health interactions can support effective preventive and public health strategies to diminish the corresponding risks to health (Prüss-Üstün & Corvalán, 2006). As our knowledge of ecosystem functioning changes, we must augment the global health lens to the health of the environment, especially as these issues becoming increasingly transnational.

The attributable fraction is the “proportion of all health problems or deaths in the community that can be attributed to the risk factor” (Prüss-Üstün & Corvalán, 2006). Disease burden is often the result of environmental, social and behavioural risk factors that can be alleviated or eliminated through different forms of interventions. While people in the affected regions can suffer from short-term and long-term health problems, these problems disproportionately affect lower income and marginalized demographics (Bosher, 2006).

Factors such as the cost-effectiveness of alternative interventions are considered when deciding upon the best approach. Preventing disease before it happens eliminates acute care treatment costs; long-term interventions are more sustainable than immediate medical treatment; and environmental modification is the most equitable option, producing benefits across diverse populations (Prüss-Üstün &
Corvalán, 2006). Transportation networks and health care infrastructure are key elements of a community’s recovery. Consequently, health care professionals should be involved with urban design, planning, construction, operation, and maintenance of critical infrastructure to increase the resiliency of essential lifelines (Bosher, 2006).

Environmental health interventions are cost-effective and produce benefits that extend beyond the health care sector, contributing to an increase in overall well-being of communities. These initiatives support environmental health components of international agencies, including land use patterns, energy use patterns, urban design, action to limit climate change, use of adequate building materials, building codes, and air and water quality (Prüss-Üstün & Corvalán, 2006).

**Roles of the government and emergency management**

The changing landscape of crises and their associated cascading effects has challenged risk management and political leadership globally (Baubion, 2013). Unexpected circumstances such as an unpredictably large scale; new or unprecedented or unusual combination; and a trans-boundary nature that does not observe geographic or policy boundaries often lead to gaps in information sharing (Baubion, 2013). The cascading risks become active threats themselves as they spread across health, climate, social and financial global systems. This non-linear nature has rendered traditional crises management a new risk, as it fails to mitigate further health burdens (Baubion, 2013). Furthermore, substantial public governance issues arise, as crisis management is often coordinated at the centralized government level but exercised at local or municipal levels. These disconnects create various barriers to effective crisis management, and are susceptible to a myriad of strategies that work at cross-purposes with different sets of goals (Baubion, 2013).

Similarly, the wave of privatization and decentralization has reduced overall capacities in governments to take direct action, while citizens’ expectations of government transparency, responsibility and ethics are increasing in the face of new challenges (Bennett, Carney & Bailey, 2012). The role of the federal government is unique to public health emergencies, which require a flexible multi-level framework that allows for the appropriate response arrangement necessary, as well as serving many legal and social purposes (Bennett, Carney & Bailey, 2012).

Local NGOs and civil society organizations are key players in maintaining a culture of preparedness, yet the increasing number of players involved in crisis management requires greater coordination of a variety of stakeholders (Baubion, 2013). Furthermore, the mix of organizations involved in a crisis management may produce contrasting interests, priorities, logistics and values (Baubion, 2013). This global complexity has contributed to the changing landscape for risk management and calls for innovative features of crisis management (Baubion, 2013).
Policy Development Considerations

Human resources

Crises can occur at any time, requiring quick decision making that has substantial health impacts. The 2009 SARS outbreak highlighted many issues for public health responses to infectious diseases. However, five years later, surge capacities were still not where they should be. As the first few cases of Ebola reached North America, Ebola highlighted the gaps in hospitals’ preparedness and response (Burgess, 2007). Hospitals rerouted human resources from other infectious diseases to Ebola awareness, training, and planning; this preparation meant health professionals were overworked and fewer resources were available for infection preventionists, yet Ebola was far less dangerous to the North American population than the Enterovirus D-68 outbreak and flu season (Burgess, 2007). Increasing surge capacities in hospitals for infectious diseases prevention and outbreaks would increase resources and prevent a burnt-out workforce that is more prone to make costly decisions (Burgess, 2007).

Another challenge within the health care system is shift work. Factors that affect a worker’s performance during shift work include age, individual physiology, personal lifestyle, social support, and family responsibilities. A well-rested workforce is optimal for public safety, and as such, an evidence-based approach to scheduling is a major component of a preventive framework (Burgess, 2007). When shift work is not an option, supporting sleep coping mechanisms and creating separate rosters for executive decision makers and supervisors will heighten the ability of public health workers and emergency management officials to positively impact the health and safety of the public (Burgess, 2007). These human resource factors underline the need for a strong health emergency management framework of action that will not be affected by the negative physiological effects of shift work or employee burnout (Burgess, 2007).

Urban planning

The limited interaction between urban and emergency planners leads to vulnerable community development. Global climate change projections and potential extreme weather patterns demand critical infrastructure be brought to the forefront of global public health agendas (Bosher, 2006). Climate change mitigation and adaptation need to work in tandem with efforts to improve urban health equity. Coordinated efforts to support health, environment, and development policies can promote cost-effective development strategies that not only provide global health gains but support social and economic benefits. Addressing the modifiable environmental factors such as physical, chemical, and biological can reduce risk and exposure, generating other co-benefits such as overall well-being. The reaction to climate change has created a paradigm shift towards conserving energy, observed in building code shifts, but there is a need to find a balance of energy conservancy at the same time as promoting health (Bosher, 2006). Community planning and architecture organizes our environments and has the means to create healthy infrastructure (Bosher, 2006).
Legal Ramifications

Emergency powers serve legal and social purposes related to health emergency management, including the non-health care sector. The balance between decentralized and centralized powers is crucial to the coordination and effectiveness of the framework (Bennett et al., 2012). The United States Department of Health and Human Services’ declaration of a public health emergency to the H1N1 pandemic changed the legal landscape of the federal response to an emergency. Global reactions to the Ebola outbreak struck many chords with human rights organizations and public health officials (Bennett et al., 2012).

Legislative arrangements for declaring a public health emergency are essential to respond to public health emergencies that meet both national obligations and public health goals. Furthermore, this framework must fall within constitutional human rights. Also, to be taken into consideration is how the emergency laws will interact with the routine non-emergency laws. Flexibility is required for timely revisions of new diseases and unprecedented cascading effects, as well as to avoid unnecessary restrictions on international traffic and trade (Bennett et al., 2012).

Health Promotion Initiatives

The UN recognizes that the highest attainable standard of health is a fundamental right. This is an inclusive concept and extends beyond disease, encompassing quality of life and overall well-being. The changing landscape of health concepts and the environments in which they are affected by means that there are lots of new opportunities to promote health, but this requires substantial support from governmental bodies, international coalitions, and voluntary and private sectors, to create policy coherence and measurable progress (WHO, 2005).

Health promotion initiatives stand to not only mitigate direct harmful effects of crises, but prevent the range of harmful behaviours that are common during a public health crisis. These behaviours are exhibited on many levels from individuals to global organizations, including organizational disruption, disorganized and disruptive group behaviour, increased drug, alcohol and tobacco use, decreased reporting’s of wellness, unwarranted trade and travel restrictions, decreased levels of organizational trust and agency credibility, increased nepotism, bribery, and fraud, and unnecessary requests for services (CDC, 2014).

Empowering communities

The WHO Ottawa Charter for Health Promotion aims to enable the population to increase control over, and improve their health via the necessary social and personal resources (WHO, 1986). The two main concepts involved with this process are enabling and advocacy. Both concepts need to be equally incorporated into this health promotion approach: to enable those to take control of those things that determine their health; and to advocate for those factors that are beyond the control of the
individual. To help reduce the divide between what we know and what we do, we should invest in networks that encourage dialogue. These networks in turn help transfer knowledge from the institutes and organizations to ground level community partners; commit to partnering between practitioners, policy makers, and diverse community stakeholders; and adopt planning and implementation methods that are used consistently (Best, 2003).

While many actors are involved in emergencies, disasters, and crises, it is important to remember the community who is most directly impacted. The risk of a negative public response is increased when there are poor communication practices. Planning, coordination, research, and training are required to advance communication practices. The public should feel empowered to make informed decisions that will reduce their risk of harm.

Community empowerment has many different influences, encompassing a very broad approach not without its own challenges, including overcoming unequal power relations, fostering individual contributions whilst promoting community health, promoting sustainability, and preventing further divides of these power relations (Wallerstein & Bernstein, 1994). Social media is one method to bridge this gap of power relations, empower individuals and communities, and advance the awareness and action on the determinants of health.

To help prevent harmful emergency behaviours, health promotion initiatives can foster resiliency through health emergency management awareness and literacy, preparedness, and capacity building (CDC, 2014). Health literacy stands to create independence and empowerment in individuals and communities. Through community-based educational outreach programs, health literacy rates can increase in tandem with health education (CDC, 2014). Community development is another way of working to build resiliency in communities. It involves a transfer of power and control from the government to communities and organizations, thereby strengthening social capital and fostering social cohesion and participation (CDC, 2014). This practice builds individual skills, strengthens community action, and empowers organizations to promote sustainable health behaviour and support healthy environments through intersectoral collaboration (CDC, 2014).

**Cultural safety**

Culture is a very complex facet of health emergency management. Promoting cultural safety and cultural education can foster effective communication before, during, and after a crisis. Cultural diversity affects communication through language, perception of risk, beliefs about institutions, credibility of information, coping mechanisms, and group versus individual mentalities (CDC, 2014). These factors highlight the importance of understanding the needs, cultural background, community history, location, and values of a community in effective communication. Cultural education allows organizations to communicate messages in a language and on a platform, that will be understood by the population (CDC, 2014).

A crisis has the potential to deteriorate population health purely based on cultural categorizations, without any change in the individuals’ identity. The shift in attitude towards cultural
categorization is often unfounded, and can result in changes to social and economic integration, discrimination based on stigma, and overall lower reporting of well-being. Fortunately, cultural education has proven to be an effective tool in changing practice. This training requires a process of consultation, developing partnerships, and encouraging engagement from all levels of stakeholders (Durey, 2010). Education also brings about a conscious awareness of personal bias that may have otherwise affected services provided (Durey, 2010).

**Technology and communication**

The American Centres for Disease Control and Prevention (CDC) acknowledges the public’s need for instant and credible communication during the time of a crisis. The crisis and emergency risk communication (CERC) approach allows public health officials to provide credible and pertinent information, preventing further damage and harm to the population. The approach opens lines of communication with stakeholders and the public, embracing principles of time-sensitivity, accuracy, honesty and truthfulness, empathy, action, and respect (CDC, 2014).

On the other hand, barriers to technology and communication can hinder public health efforts. Further investments to improve low-tech information delivery and develop systems for faster adaptation are required to build capacity of the emergency management system. This encompasses E-health, including its ability to increase literacy, as well as help remove barriers, transferring knowledge at a much quicker rate (CDC, 2014). It allows individuals to access information that was once only available through a physical visit, removing barriers to knowledge (CDC, 2014). At the same time, there are possibilities it will increase inequities as those who require the most help cannot always afford technology. Initiatives to create wider accessibility to technology can reduce this gap.

**Conclusion**

Considering this changing landscape of crises, international agencies are taking on the necessary tasks of discussing and assessing current practices and approaches, and most importantly, identifying good practices. Health promotion initiatives for resilient communities are aided by legislation, as the role of the government becomes the critical factor when capacities are disrupted. Mitigation and adaptation techniques need to work in tandem with efforts to improve urban health equity. Without targeted interventions, health inequities are likely to continue to grow both globally and within Canada. Most OECD governments have accounted for the changing nature of risks and crises, but as crisis continue to evolve, even the most resilient systems will face challenges.
References


