

# **Lessons Learned from Canada: The Imperative to Build a Culture of Preparedness for Health Care Providers as First Responders<sup>1</sup>**

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## **Summary of the project**

The lessons learned from the 2003 SARS outbreaks in Canada were examined with respect to the future preparedness of front line health care providers. It is only in recent

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<sup>1</sup> This report is a condensed version of a more comprehensive project report available at <http://www.cprn.org>.

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years that health care providers have been identified as important stakeholders in disaster response planning and policy development. The research study examined the response to SARS as a proxy for infectious disease events through literature reviews, focus groups and a survey of emergency and critical care nurses, and policy review.

**Keywords:** Severe Acute Respiratory Syndrome (SARS), Public health emergencies, Emergency preparedness planning, Pre-hospital disaster mediation, Infectious diseases

## Introduction

Over the last decade, the global proliferation of new infectious diseases and the possible threat of Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) terrorist events have spurred countries to examine their capacity to respond to a large scale public health crisis. Governments and health care organizations are preparing response mechanisms. The Canadian government has stockpiled emergency supplies, such as antiviral medications and personal protective equipment, and developed mobile hospital emergency response teams. It has funded research and development, security and intelligence measures, public awareness campaigns, and other emergency preparedness and risk management plans. However, little attention has been given to the human resources dimension of public health risk mitigation.

Health care workers (HCW), including nurses, physicians, allied health professionals and personal care workers are involved in the response to a public health emergency, and without them, investment in physical resources is of limited use. Large-scale public health emergencies can strain health care systems beyond capacity. When this occurs, the physical and psychosocial impacts extend throughout the community, affecting vulnerable subgroups, such as children and the elderly. In order to protect the public, the health and resilience of the health care workers should be protected first.

The SARS virus was contained in Canada not by genomics or advanced pharmaceuticals, but by 'old fashioned' infection control measures including hand washing, isolation and tracing of cases, and quarantine. (Naylor et al., 2003). Recent federally commissioned reports by Naylor and Kirby examining the public health response to SARS articulate the need to improve Canada's health infrastructure, training, integration, emergency responsiveness, particularly in quarantine situations (Kirby, 2003; Naylor et al., 2003). The SARS epidemic demonstrated the need to amend support mechanisms such as coordinated communications from authorities, core infection control curriculum for frontline responders, training and public education for containing infectious diseases in quarantine conditions. However, the needs of health care first responders and first receivers<sup>3</sup> extend beyond enhanced training, risk communication and stockpiles of personal protective equipment.

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<sup>3</sup> "First receivers" is a recently coined term that is gaining favour among professionals working in the emergency preparedness and response fields. It serves to differentiate health care professionals who "receive" and treat casualties in emergency care facilities from traditional first responders such as police and paramedics who work in the field.

## Methods and Techniques

In order to mitigate the impact of future infectious disease outbreaks and CBRNE threats, the 2003 SARS outbreak and other public health emergencies were examined for psychosocial effects on health care workers and their families. The multi-year, multi-method project consisted of the following phases:

1. Comprehensive literature review on support mechanisms for health care workers as first responders.
2. A series of five focus groups conducted in Ottawa, Toronto, Vancouver and Halifax between November 2005 and February 2006. Participants included Canadian registered nurses, registered practical nurses, nursing managers working in emergency or critical care, as well as infection control workers, hospital-based nurse educators and union representatives. Using an interview matrix format, participants discussed their experiences of SARS or other emergencies, identified gaps in supports, and explored preparedness.
3. A national web-based survey (April to August 2006) conducted with emergency and critical care nurses (n=1543) three years after the SARS outbreak.<sup>4</sup> Questions were asked about psychosocial, family and health impacts resulting from outbreaks of infectious biological agents.
4. A qualitative content analysis of emergency plans for pandemic influenza preparedness and response of nine jurisdictions at federal, provincial, municipal and institutional levels. The plans were analyzed for policies designed to support health human resources.
5. A sex and gender based analysis of personnel policy and support mechanisms for public health care workers. Biological sex and the social construct of gender were integrated into an existing population health risk management framework by a panel of interdisciplinary scientists with expertise in risk assessment and risk management, psychosocial stress, occupational health and safety, gender and women's health.
6. The dissemination of the findings to policy audiences. A national policy forum was held in December 2007, with representatives from federal, provincial and municipal health and labour departments, nursing and health care non-governmental organizations, and frontline nurses who worked during the SARS outbreak in 2003.

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<sup>4</sup> Based on power calculations, 1,500 nurses who worked in emergency and critical care during the past three years were surveyed. As 12% of the Canadian nursing population work in these specialties, 15,000 nurses were invited by national and provincial/territorial associations, online posting, and advertising. Invitations to participate were sent in proportion to the size of each provincial nursing population. In comparison to the 2005 Registered Nurses Database, the resulting sample is similar to province of residence (CIHI, n.d.) and rural/urban distributions (CIHI, 2006) of the registered nursing profession in general. Specific to critical and emergency nursing, the sex breakdown is similar, while the sample tends to have a higher proportion of RNs with bachelor or more advanced degrees, and slightly fewer practitioners employed by hospitals (Department of Public Policy, Canadian Nurses Association, 2006). Age related demographic characteristics are not comparable due to differences in survey categories, though the trend is similar to these aforementioned sources.

## *Resiliency and Health Care Workers*

The concept of resiliency, which emerged from ecology<sup>5</sup>, is useful in examining the strength of the public health care system and its workers when exposed to the stress of a large-scale outbreak. A resilient health care system is one that can adapt rapidly to increased demand for essential medical treatment and services. In the context of this paper, resiliency is defined as the capacity of health care workers to fulfill their emergency response functions. Health care worker resiliency depends on the cumulative effects of biological, environmental, and social health determinants and the interactions among them.

Although individual health and resiliency are highly variable, health care workers share several health determinants. Since the vast majority of Canada's health care workers are women, (CIHI, 2007) the biological and social determinants of sex and gender are relevant. Recent research indicates these strongly influence many aspects of health disasters, including differences in physiological susceptibility, risk perception and reaction to disasters (Krewski et al., 2006; World Health Organization, 2002).

The work environment is another determinant that affects health care worker resiliency. In a crisis, work may be more hazardous, with a greater risk of exposure to infectious agents, the requirement to wear and restrictive personal protective equipment, increased workload, longer shifts, and mandatory quarantine protocols. Additionally, pre-existing conflicts between professional and family responsibilities, reported by women health care workers in downsized/restructured health care organizations (Burke & Greenglass, 1999) typical in Canada can be greatly exacerbated during public health emergencies.

### *Informational, Emotional and Instrumental Supports*

Support mechanisms for health care workers can be divided into three categories: informational, emotional, and instrumental (House (1981) *cited in* Heaney & Israel (2002); O'Sullivan et al., 2007). Informational support refers to all forms of communication, including occupational training and skill development and exchanges between frontline health care workers and public health, supervisors, management, occupational health and safety, unions, etc. Emotional support relates to any type of intervention intended to alleviate the negative emotional impacts of the work environment on health care workers, such as debriefing sessions and access to counselling services. Instrumental supports refer to all other organizational programs, protocols and interventions that assist health care workers in performing their occupational roles, including material supports such as personal protective equipment and vaccines, creative human resource mobilization strategies and visible leadership during crisis events.

## **Findings**

The nurses identified three challenges to the health care system to respond during a crisis. *Surge capacity* depends upon having a healthy, willing, supported and prepared

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<sup>5</sup> A resilient system, when acted upon by a stressor, is able to continue to fulfill essential functions (Resilience Alliance: A basis for sustainability, 2007). Resilience in psychology and sociology refers to the capacity of individuals to withstand and cope with stressors (Earvolino-Ramirez, 2007).

health care workforce. *Infection control* is critical to containment of infectious disease outbreaks; some current management practices and discrepancies in benefits threaten the system's ability for infection control. *Risk communication* provides information through credible sources at the right time; nurses' experiences with SARS highlight weaknesses in existing risk communication strategies. These challenges are interconnected and influence each other, but are presented individually.

## **1. Surge Capacity**

During an infectious disease outbreak, the health of frontline health care workers is important and must be protected. Not only will there be an increase in demand for treatment, but also a significant decrease in the size of the health care workforce. Heavy workload, overtime hours, and high stress levels can make health care providers vulnerable to chronic fatigue and burnout, which can lead to illness, refusal to work, and eventually, withdrawal from the profession. The data indicates that surge capacity will be influenced by the size of the health human resources (HHR) and the preparedness of individual nurses.

### *1.1 Ensuring Adequate Staffing*

Nurses involved in the study and participants at the policy forum agreed that the health care system is already working at maximum capacity. One policy forum participant summarized: *"the terrible secret is that there is no surge [capacity]"*. As stated by one nurse in a focus group, *"Hospitals are already understaffed; a crisis would compromise patient care."* Policy forum participants emphasized that a system that is stretched to its limit in regular operation cannot be resilient. Both nurses and policy forum participants stated the need to be proactive in staffing issues.

Redeployment of staff and students is a potential solution noted in some emergency plans to handle the surge. However, sending workers into high risk situations without adequate training may spread the infection, jeopardizing coworkers as well as patients. From the study, it was evident that unfamiliar environments and procedures, lack of confidence in one's training, and high pressure working conditions would be stressful for redeployed workers. Policy forum participants emphasized the need for early task identification that can be delegated to less specialised or skilled HHR resources to reduce the workload for those with expertise in emergency. According to participants, those redeployed should be kept out of harm's way, and given additional training, supervision and material.

### *1.2 Addressing Willingness and Ability to Work*

There are discrepancies in the remuneration of nurses who put themselves at risk during public health disasters. Occupational health and safety legislation limits the rights to refuse dangerous work for those employed in health care institutions. However, policy forum participants noted that nurses who are self-employed, work for an agency, or who have 'casual status' can always refuse work. Additionally, the variations in employment status influence the benefits available to those who do fall ill or need to care for ill family members, putting significant strain on those who are main or sole breadwinners for their

families with dependent children (a situation applicable to 23% of the survey respondents).

Nurses encounter difficulties balancing family responsibilities with a career in health care. Many nurses are responsible for the care of dependent children and/or aging parents. During focus group discussions, health care workers described being caught in an ethical dilemma between duty to care and personal/family safety.

Anti-virals, vaccination, and prophylactic treatment, are strategies that participants identified as supporting them in remaining at work. According to the Canadian Pandemic Influenza Plan (Public Health Agency of Canada, 2006) frontline health care workers, public health responders, and health decision-makers are seen as having a critical role in disaster response efforts, thus are granted first priority status for vaccination. However, the existing guidelines mention vaccination for the children, spouses, or dependent parents of health care workers, but conclude, "...singling out these individuals would not be logistically feasible or ethically justifiable" (Public Health Agency of Canada, 2006: Annex D, p. 4).

### *1.3 Managing Point of Care Issues*

Point of care challenges for critical care nurses involve both the provision of care while wearing personal protective equipment, and the emotional demands of caring for dying patients. Nurses indicated that when dealing with infectious diseases, tasks are made more difficult by the restrictive personal protective equipment such as double gloves, double gowns, respirators, goggles and face shields. An outbreak of pandemic disease, terrorist attack, or natural disaster may flood hospitals with hundreds or thousands of these patients, and health care providers' capacity to cope will be challenged. Infectious disease outbreaks, such as SARS, are likely to claim a disproportionate number of health care providers. The psychological impact of having to care for coworkers infected on the job can be emotionally devastating.

### *1.4 Preparing the Nursing Workforce*

Most of the nurse respondents perceive they are a little and somewhat prepared (professionally) for another infectious disease outbreak or natural disaster, while less than 10% reported that they were 'very much' prepared. In contrast, most nurses said that they were not at all prepared at any level for CBRN emergencies.

#### a) Training in Infectious Control

In the focus groups, many participants noted the lack of financial support available for health care workers to obtain training in infection control and preparedness. While interested, many were not able to afford the tuition or take the time off without pay.

Emergency drills are useful ways to prepare individuals to function effectively in high risk, high stress, and unpredictable situations (Bartley, Stella, & Walsh, 2006). However, over 90% of survey respondents reported they had *not* participated in a mock emergency scenario in their place of employment.

## b) Ensuring Fit of Personal Protective Equipment

Of the three emergency plans examined, not one outlined a requirement for regular fit-testing of masks and physical barrier type equipment such as gloves, gowns, and face shields. During focus group discussions, one nurse commented “*Most people [...] have been fit tested for N95 mask - but testing certificate expired 6 months ago.*”

## 2. Infection Control

### 2.1 Addressing Job Insecurity

Participants in focus groups noted that casual and part time health care workers often work at several different institutions in a single week in order to earn a full time salary. This practice is more common among nurses than in the general population (Shields & Wilkins, 2006) and can spread infectious disease.

### 2.2 Laundering Contaminated Uniforms

In most hospitals, physicians are provided with ‘scrubs’ but nurses and other staff are expected to provide and maintain their own uniforms. However, during infectious disease outbreaks, wearing uniforms out of the hospital and bringing them home to be laundered poses a significant risk to the public and to the worker’s family.

### 2.3 Supporting Quarantined Workers

Under work quarantine, employees continue to work, but are restricted to their homes. Fully quarantined workers are restricted either to the home or hospital, depending on the level of exposure and whether or not they are displaying signs of illness, resulting in significant disruptions to lives of health workers as well as their families. The SARS outbreak necessitated the quarantine of hundreds of hospital employees, and the lack of a support system was quickly apparent.

During focus group discussions, nurses repeatedly commented on the difficulties meeting the most basic needs of daily life during quarantine. For quarantined workers who are single or without the support of another adult family member, the delivery of food, medications, and masks or other personal protective equipment was often difficult. In addition, nurses under work quarantine were prohibited from public transportation, but they were not provided with free parking, a considerable expense at many hospitals. Often workers without access to a car were not provided with alternatives, nor were they offered reimbursement for taxi service (which itself might break quarantine restrictions).

## 3. Risk Communication

Uncertainty regarding the nature and magnitude of health threats has been shown to increase the perceived danger and stress levels (Krewski et al., 2006). SARS was known to be quickly and easily transmissible by close contact with infected individuals, most likely by respiratory secretions (Shaw, 2006), and had a high fatality rate (~10% in Canada). Nurses were expected to treat SARS patients, and were told that with the

proper personal protective equipment, it was safe<sup>6</sup>. Much of the information about SARS was, at the time, uncertain. Nurses described high levels of uncertainty, inconsistent risk communication messages, changing infection control protocols, and inconsistent compliance with those protocols. The situation fostered conflict between nurses and administrators, as well as social exclusion.

### *3.1 Accessing Trustworthy Information*

Of the nurses who had worked during an infectious disease outbreak within the last three years, approximately 1/3 reported that they had been given conflicting orders by staff members. During SARS, many of the quarantined nurses reported that they were sent home, but were not given specific instructions.

Nurses who had been quarantined reported feeling cut off from reliable information sources. Already fearful about becoming infected or infecting their families, conflicting media reports exacerbated the anxiety and sense of isolation. Others who had been trapped in the hospital during natural disasters such as Hurricane Juan (September 2003) expressed similar experiences.

### *3.2 Improving Credibility of Leadership*

Nurses reported that management was not always visible during SARS, and in some cases, managers worked from home or offices off-site. Many of the managers who remained on-site kept their distance from infected patients, suspected cases, and the health care workers who treated them. Several nurses described the anger, demoralization and sense of abandonment they experienced by the refusal of certain managers to enter the patient wards. According to the nurses, strong leadership during a crisis involves not just being present, but being accessible, and willing to work face-to-face with staff. Several policy forum participants noted that the lack of leadership fostered suspicion, and stressed that these issues persist. Credibility was further exacerbated by the lack of an infection control specialist in many of the hospital administrative teams.

All the hospital pandemic plans reviewed by the research team specified the inclusion of an infectious disease expert in the disaster management team. One recommended the creation of a technical advisory group including an infectious disease specialist, while the others planned to work in conjunction with provincial agencies and include them in decision making processes. However, only one of the hospital pandemic plans provided a detailed account of the emergency chain of command.

Over half of nurses surveyed were unaware or uncertain of a formal emergency plan, suggesting a disjuncture between planning activities and organizational communication. In addition, policy forum participants emphasized that nurses and other health care first responders are a valuable source of information, particularly when epidemiologic data is limited. Communications need to be bidirectional between management and frontline first responders and receivers.

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<sup>6</sup> There were 44 deaths, including 3 health care workers during the SARS outbreak. Total number of confirmed cases was 251.



## 4. Moving forward

Policy forum participants emphasized that the resilience of the health care system is challenged by the lack of trust and the 'leanness' of the system.<sup>7</sup> The lack of trust between frontline nurses and institutional management manifests itself in suspicion of communications from management. Participants stated that the leanness of the health care system has multiple manifestations, but the important ones are the challenges for surge capacity and infection control.

### 4.1 Existing Federal and National Initiatives

- The Public Health Agency of Canada has developed and continues to refine and implement a national pandemic response plan, including surveillance and early detection networks, scientific research, and public awareness campaigns.
- The development of the national Health Emergency Response Teams (HERT), with a wide range of skills for establishing a mobile response (e.g. from electricians to health care workers to decontamination specialists) are dispersed across the country with the capacity to respond to any type of emergency or disaster within 24 hours of a request.
- The Public Health Agency of Canada has developed an online course for spring 2008 for frontline health care workers, family physicians, emergency department physicians, and nurse practitioners. At the time of writing, the Agency had not confirmed whether or not this course would be available to other nurses.
- The Public Health Agency of Canada is currently developing a personal family preparedness guide.
- The Department of National Defence (DND) has systems in place and experience with multiple strategies to support their military and civilian staff and their families in a crisis or in advance of deployment. Additionally, the DND has expertise in prevention and treatment of post traumatic stress disorder.
- The Canadian Federation of Nurses Unions is a lead partner on multiple pilot projects aimed to improve recruitment and retention of nurses across the nation through the development of healthy workplaces.
- Canadian Council on Health Services Accreditation (CCHSA) documents exceptional practices observed during accreditation visits and posts information on their website.

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<sup>7</sup> The 'leanness' alluded to is a reference to the substantial organizational restructuring, downsizing and merging common in the Canadian health care system since 1992, described succinctly by Burke & Greenglass (1999). The system now relies upon fewer health care professionals to handle similar or increased patient volumes.

## **4.2 Provincial/Territorial Initiatives**

- In 2006, the Quebec government collaborated with provincial health care licensure bodies in a survey of health care professionals to proactively determine their skill sets and willingness to respond in a pandemic influenza.
- In Ontario, the Worker Safety Insurance Board and six Ontario medical colleges collaborate to ensure occupational health curriculum is included.
- The Ontario Health Plan for Pandemic Influenza (Ontario Ministry of Health and Long-Term Care, 2007) describes engineering controls, administrative and work practices, personal protective equipment, and infection prevention and control measures for employers. The benefits for employees of varying employment status are also mentioned.

## **4.3 Institution and Community-based Initiatives**

Health care institutions and local community settings are where most of the problems occurred. These problems are influenced heavily by external factors such as financial resources given to health care organizations, availability of HHR, and government priorities. However, some promising practices were identified:

- Every hospital has a joint occupational health and safety committee. This committee was thought to be a good vehicle for implementing improvements.
- All three hospital emergency plans reviewed made provisions for increased staffing demands during an emergency such as re-prioritization of health services, and diversion of staff from non-essential or elective services.
- In SARS hospitals, Employee Assistance Programs provided counselling and related services 24 hours/day, 7 days/week during the outbreak.
- During the 2003 heat wave, the City of Ottawa used 'bottom up' communication to implement cooling stations for the elderly. Seniors were asked directly what services would increase the usage of the stations. As a result, the cooling stations offered films and transportation.

## **5. Opportunities for Change**

### *5.1 Federal and National*

Policy forum participants, many of whom work for the federal government and health related non-governmental organizations, stated the need for a federal vision for emergency preparedness to ensure consistency of expectations and equitable, adequate distribution of resources allotted to health care system preparedness across provinces and territories.

- The federal government can develop a more comprehensive toolbox for preparedness planning for multiple levels of decision makers. Pilot projects were seen as a useful strategy to assist the development of the 'toolbox'. The Expert Group on Emergency Preparedness and Response (of the Pan-Canadian Public Health Network) and Council of Health Emergency Management Directors are both

federal/provincial/territorial working groups that would be in a position to move this forward. The Canadian Council on Health Services Accreditation could expand their accreditation standards to include documentation of risk communication skill development, proactive communication with employees, and disaster practice drills.

- Pan-Canadian union organizations and occupational organizations (e.g. the Canadian Federation of Nurses Unions and the Canadian Nurses Association) are positioned to communicate with members about the occupational health and safety legislation that limits their right to refuse dangerous work.

### *5.2 Provincial/Territorial*

Participants noted the need for more discussion with partners from federal, provincial and territorial governments.

- Mechanisms already in place, such as the Federal/Provincial/Territorial Expert Group on Emergency Preparedness and Response, and the Council of Health Emergency Management Directors, can take a lead in the HHR side of emergency preparedness. This would include improving real-time communication and information retrieval systems, access to antiviral and equipment stockpiles, cross-jurisdictional professional regulations, and linking best practices<sup>8</sup>.
- Provincial professional regulatory bodies often mandate specific certification (e.g. CPR) for licensure. In some cases, they provide free access to online education to support attainment of the qualification. The existing curriculum designed by the Public Health Agency of Canada might be used as a framework.
- Universities have the ability to prepare these future workers. Skill development in Infectious disease, natural disasters and CBRNE response need to be included in Canadian nursing, medical and health professional schools.

### *5.3 Institutional and Community issues*

A checklist, compiled for this study, assessed existing emergency plans, based on a literature review and focus group findings. Practice with unfamiliar procedures is more valuable for health care workers than emergency plans (Bartley, Stella, & Walsh, 2006). Nurses do not perceive they are prepared to manage potential disasters, of accidental, natural or intentional origins. The redeployment strategies of hospitals emergency plans are encouraging, but neglect to mention the training needs of those being redeployed. A combination of education and skill development and institutional level practice is needed.

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<sup>8</sup> A policy forum participant suggested that some of the concerns regarding limited right to refuse dangerous work, applicable to those employed by health care institutions could be clarified through similar mechanisms utilized to address concerns about HIV in the past. With the emergence of HIV in the 1980s, many health care employers were accused of not providing safe work environments. Lack of and misinformation was central to these accusations. Educational initiatives, rolled out through appropriate programs and specific to provincial legislation, successfully addressed these issues.

Emergency drills allow not only the practice of core skills, but also the identification of strengths and gaps in competencies and planning. In the DND's experience, table top drills<sup>9</sup> are a first step in testing plans and leadership; once leaders are ready, larger-scale disaster drills create opportunities to further assess the strengths and weaknesses of the existing plan. Evaluation of drills can inform decisions on all aspects of preparedness (Bartley, Stella, & Walsh, 2006). By making periodic drills routine in emergency preparedness, hospital leadership can identify potential issues, develop contingency plans, and improve disaster response.

## Conclusion

Mitigation of public health disasters is a complex task that requires the cooperation of multiple governments, jurisdictions, regulatory bodies, and organizations. Not all situations are preventable, thus systems need to be prepared to minimize the impacts and damage caused by both intentional and unintentional disasters. Stakeholders in emergency response include law enforcement, the armed forces, all levels of government, health care workers and their organizations, academic researchers and many others.

In this project, traditional gender roles and work-life conflict emerged as significant and often overlooked determinants in health care worker resiliency. The weaknesses and gaps in critical human resource support mechanisms identified during this study revealed persistent threats to the resilience of the health care system during outbreaks and other crises. Some promising practices have emerged at federal, provincial/territorial, and institutional levels, but gaps persist that weaken the health care system's ability to effectively manage surge capacity, infection control, and risk communication.

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<sup>9</sup> Table top drills are a facilitated group exercise where decision makers and representatives from various departments within an organization, or across the spectrum of emergency response organizations, work through a hypothetical emergency situation. Such drills test existing operational plans, identify problems, and start a problem solving process.

## Limitations of the project

1. According to CIHI (2007), women make up over 90% of the nursing workforce, but only 30% of the physician workforce. Hence, the findings of our study that highlight the need for supports that respond to women's traditional gender roles within families may not be transferable across all occupational groups.
2. Not all governmental departments (e.g. Public Safety Canada) or non-governmental organizations working in this field (e.g. Canadian Healthcare Association) participated in the policy forum. Representatives from these sectors were invited, but declined to participate. Thus, our promising practices and opportunities for change are not inclusive of all potential
3. While the survey included a small number of male nurses as well as nurses in the military, we believe that these are populations deserving of additional research.

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