Supporting Emergency Health Services during a Pandemic: Lessons from the Canadian Red Cross

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ABSTRACT

The COVID-19 pandemic has tested Canada's readiness capacity as emergency health needs continue to exceed some communities' capacity to respond. To address this gap, the Canadian Red Cross (in collaboration with local, provincial, territorial, national, and Indigenous partners) have leveraged international experience in humanitarian response and preparedness, developing innovative new response services, delivery modalities, and protocol through which to mitigate and manage risk. This approach breaks down emergency management into two main streams - health interventions and disaster management - to innovatively and effectively cope with increasingly complex and frequent requests for support. Using internal data from within the Canadian Red Cross, this paper presents and discusses the services, roles and expectations of this two-stream approach which has been designed to (i.) support COVID-19 testing and vaccination, (ii.) support outbreak crisis management, especially through epidemic, prevention, and control interventions, and (iii.) support traditional emergency management responses in the midst of a pandemic. It concludes by reporting on the successes of the two-stream approach to date while scoping further the potential evolutionary track of some of these services, their underpinning methodology, and appetite for recovery operations in the near future. This approach may therefore be of value to other organizations or practitioners coping with emergency management challenges during a pandemic.

Keywords

Pandemic, health, emergency management, Red Cross, COVID-19.

INTRODUCTION

Disasters in Canada are becoming more frequent, more severe, and their human consequences more complex (Database of Canadian Disasters, 2020). As the COVID-19 pandemic has thrust humanity into a face-to-face standoff with human consequences, economic devastation, and mental health challenges - be it through exercises and pandemic modeling or academic historical analysis - Emergency Management systems have been impacted and stretched in many cases beyond their limits of design. Furthermore, the risks posed to Canadian communities are becoming more uneven, which is predicted to increase with underlying phenomenon such as the flu season, seasonal flooding and loneliness. In response, the Canadian Red Cross (CRC) has assessed, designed and implemented a range of services which can more effectively address the provision of humanitarian aid to vulnerable people and communities in both the short and long-term. This relieves pressure on government agencies and provides better support to Canadians by, enhancing capacity, and capitalizing on traditional areas of expertise the CRC hold in both health and emergency management (EM).

The pandemic has laid bare the strengths and shortcomings of traditional response systems aligned to an environment of less risk and hazard and it has become increasingly evident that there is a pressing need for

Canada's wider EM landscape to evolve in response to present and anticipated future risks. This is even more so the case given the country's unique interplay between its geographical anomalies, multi-jurisdictional system and its pocketed population dispersion. Rising levels of urbanization, a demographically diverse population and complex infrastructure dependencies all continue to make clear that disaster and emergency response (whereby an emergency is an unexpected event requiring immediate action and/or help, whereas a disaster is a large-scale phenomenon resulting in damages and mortality) will only continue to increase in complexity alongside public expectations on government bodies and emergency management infrastructure.

To address these gaps in rising expectations, EM may now be in an ideal position to consider more robust, holistic, and tailored approaches to traditional response methodology in order to ensure future risk can be mitigated, planned for, and robustly handled through adequate and more broadly managed targeted response mechanisms. Citizenry in case of disaster (and disruptive events more broadly) or emergency are fundamentally shifting their approach to how they collaborate with support agencies and non-state actors, including the CRC in its unique role as auxiliary to public authorities, augmenting government programming and support at the municipal, provincial, first nation or national level when called upon in the provisioning of certain essential services as they relate to disaster mitigation, preparedness, response, and recovery.

Using internal data from within the CRC, this paper scopes gaps as seen and experienced from the perspective of CRC leadership and staff working closely to respond to pressing requests for support through established government and community partners across Canada and explains the rationale behind steps that the CRC has undertaken to effectively support partners throughout the COVID-19 pandemic. It summarizes the main findings and observations from the CRC's response, which are methods in (i.) supporting COVID testing and vaccination, (ii.) supporting outbreak crisis management and (iii.) supporting EM responses during a pandemic. These may offer valuable knowledge for other organizations in the not-for--profit sector, while emphasizing the importance that non-governmental actors have in this modern EM era; and will continue to have in coming years. It concludes by discussing the importance of supporting roles and knowledge between emergency health interventions and EM, which is becoming increasingly important in a world where both the risk of disasters, and the escalation of health phenomenon, is rising.

BACKGROUND

Over the last decade, natural disasters have killed on average 60,000 people, have exceeded damages in excess of 187 billion USD, and have displaced roughly 24 million individuals annually (Merz et al., 2020; PreventionWeb 2020). Among the global risks, extreme weather events and geophysical phenomena such as damaging earthquakes and tsunamis are perceived as the top first and third risks in terms of likelihood, and as the top third and fifth risks in terms of impact (World Economic Forum, 2019). These remain the predominant hazards that the Canadian landscape is prone to, and ones that are predicted to increase in frequency, severity and complexity in coming years (Agrawal & Cox, 2019). Alongside this, Canada faces floods, wildfires, drought, extreme heat, tropical storms, melting permafrost, and coastal erosion which all contribute to its unique physical riskscape (EM Strategy Canada 2020; Agrawal & Cox, 2019).

Urbanization, population growth and increasing interconnectivity, are expected to further aggravate the risks imposed by hazards also (Huppert & Sparks, 2006; Jongman, 2018), which coincide with Canada's yearly upward 1.4% trend in population (Canadian National Census 2016). Combined, this poses significant risks to communities with many Indigenous communities among the most vulnerable due to their remote and coastal locations, lack of access to Emergency Management (EM) services, and reliance on natural ecosystems (EM Strategy Canada 2020; Donatutu et al., 2014). Climate change, too, is acting as a major driver and amplifier of hazards globally (UNDRR, 2019). While climate change is a global phenomenon, its impacts are often the harshest on the most vulnerable communities (Gidley et al., 2009). Particularly for indigenous populations in Canada, studies such as Downing & Cuerrier (2011) and Newton et al. (2005) argue this may be the largest threat to land use, fishing and cultural ties to the land. Climate change has become - and remains - a major scientific, political, economic, and environmental issue during the last decade that must be accounted for in any kind of disaster management planning and processes development (UN Framework on Climate Change 1992; Kyoto Protocol 2005).

Particularly in 2020, the risks posed by global hazards have significantly increased due to the discovery and subsequent spread of the new novel coronavirus (COVID19) (Cardil & de-Miguel, 2020), which developed into a pandemic as of March 2020 (World Health Organization 2020). This has resulted in the undertaking of substantial and rapid emergency health interventions in most countries world-wide, not only in response to the crisis, but also for the mitigation, preparedness and prevention of future outbreaks (Phillips et al., 2020). It has also had a dramatic effect on emergency response to hazards, driving up the economic cost of deployments, increasing mortality rates, exposing more to additional risks, slowing response times and generating multi-faceted

chaos (UN Habitat 2020; Cardil & de-Miguel, 2020; Hariri-Ardebili, 2020). To meet the challenge of reducing coming natural disaster impacts on human health while minimizing the risk of virus transmission, national and international policies need to address contingency plans aiming to improve prevention, preparedness, mitigation, response and rehabilitation to new emergency events (UN Habitat 2020).

Such contingency plans need to be adapted and implemented by emergency agencies to their specific work environments (Cardil & de-Miguel, 2020). This includes establishing safe work protocols through Epidemic Prevention and Control (EPC) guidance and infection, prevention, and control mitigation strategies to prevent new infections through strict security measures according to international health regulations (Centers for Disease Control and Prevention, 2020; World Health Organization, 2020), identifying possible cascading hazard scenarios (where one hazard may trigger or exacerbate another), risk assessments and re-designing activities considering social distancing (Fearnly & Dixon, 2020). Pre-crisis emergency planning and coordination of all stakeholders, and response management plans for early mobilization of resources are critical (Coombes, 2020). In this sense, agencies need to optimize resources in strategic planning through proportional responses to incidents based on potential consequences, risks and community vulnerability (Fearnly & Dixon, 2020; Coombes, 2020; Winter, 2020).

Given the unprecedented nature of hazards in the current day, new approaches need to be established to respond to disasters and other disruptive events while managing the COVID-19 pandemic (World Health Organization, 2020). These are already beginning to be documented while countries rush to adapt their disaster management protocols (Gersons et al., 2020). In Canada, the Province of Manitoba, the Regional District of Wood Buffalo (Fort McMurray) and Ottawa City responded to flooding caused by a particularly unpredictable 2020 freshet season, while aiming to protect response workers from COVID-19 (Ishiwatari et al., 2020). In Japan, local governments suspended receiving volunteers in February 2020 who had been engaged in rehabilitation works in areas devastated by Typhoon Hagibis in 2019, delaying recovery from the disaster (Sakamoto et al., 2020). In Bangladesh, humanitarian assistance and government organizations prepared for cyclones as well as a COVID-19 outbreak in the densely crowded camps in Cox' Bazar, which shelter some 900,000 Rohingya refugees (Islam & Yunus, 2020). The following section will therefore introduce the unique aspects of the Canadian riskscape, which is the setting for the CRC's COVID and EM responses. This is an important foundational step in understanding, creating and adapting a national strategy.

THE CANADIAN RED CROSS & NATIONAL RISKSCAPE

The CRC has a long history of supporting the needs of Canadian citizens facing the impacts of disasters and world events. Originating back to the society's roots in the late 1800s, health interventions were considered one of the fundamental roles of the Red Cross (Glassford, 2008). This developed throughout both world wars and continued into the 21st century where the organization maintains its peacetime health and risk orientated mandate (Glassford, 2008). The current landscape of the national society has developed into one of the most trusted brands in the eyes of Canadians - a trend also replicated globally (for example Boenigk & Becker, 2016, illustrate that the German Red Cross has by far the highest brand awareness and trust of all non-profit organizations in the country). The CRC remains united by the overarching will to do good, with its foundations notably based upon what it calls "the seven fundamental principles" which include: humanity, impartiality, neutrality, independence, unity, and universality (The IFRC, 2020).

The CRC maintains these principles in their development of tailored EM and health responses to the unique aspects of the country in the present. In 2018 it created and implemented its Indigenous Peoples Framework designed through an inclusionary consultation process at a time where the organization has explicitly endorsed and promoted steps towards reconciliation with First Nations, Métis, and Inuit communities. This remains critical in the Canadian context where racism, discrimination and preconceptions of Indigenous peoples still contribute to heightened vulnerability and risk. In 2020, the society outlined its future goals to continue improving disaster relief particularly adapting to increasing wildfires and flooding (CRC, 2020). Now, the society is able to offer valuable additional resources proven to help with disaster relief - such as emotional and psychosocial support and temporary accommodation for displaced individuals - that goes beyond humanitarian services alone.

Currently, the CRC maintains a roster of over 10,000 trained volunteers across Canada, including over 100 local responders specifically trained to support Indigenous communities and an additional nearly 400 volunteers trained in delivering psychosocial support. Beyond this, the Red Cross has systems in place to recruit and deploy surge volunteers, partners or staff for all its core services across the country, enabling the organization to effectively integrate Canadians who want to contribute with their skills, capacity and time to the CRC mandate. This is complemented by approximately 150 trained and highly skilled emergency management staff, including a team of Rapid Response Managers (RRMs) whose role it is to deploy and provide leadership to emergency operations. These can include augmenting local capacity as reception and information centers are first stood up, emergency

shelters or management of commercial lodging operations are undertaken, outreach and rapid assessment is conducted, and local authorities are generally offered tailored support where they may need surge capacity. Further, the CRC often finds itself— whether formally identified, or informally designated—as a convener agency within the nonprofit community, interested in working alongside local, national, and international partners in an effort to mitigate duplication of services, avoid causing harm, while leveraging and streamlining coordination and collaboration of agencies where complementary organizational missions and resources align. This surging workforce during both medium and large-scale responses provides continued support to those most vulnerable throughout the disaster lifecycle. This remains important as immediate relief services and assistance evolve into sustainable long-term recovery operations that in some devastating disaster cases can span several years.

The CRC remains engaged at many levels responding to urgent relief needs of vulnerable populations as the COVID-19 pandemic continues to evolve in terms of size and scale. People who were already marginalized, or had limited access to services prior to COVID-19, face some of the most significant risks to contagion and survival (Donatutu et al., 2014). Certain groups are seen to be more vulnerable due to their social, legal and/or economic status, such as the elderly, low-income populations, people experiencing homelessness, people without family, wage workers, migrants, people living with disabilities, people deprived of liberty, and Indigenous communities which are at risk due to variances in Indigenous title, rights and sovereignty as well as gaps in the social determinants of health (figure 1 below). Dynamic modelling has shown that despite phased reopening of daily life across Canada, there is a need to adapt the CRC's current and future responses to increase readiness and capacity (shown in figures 2 and 3 below).

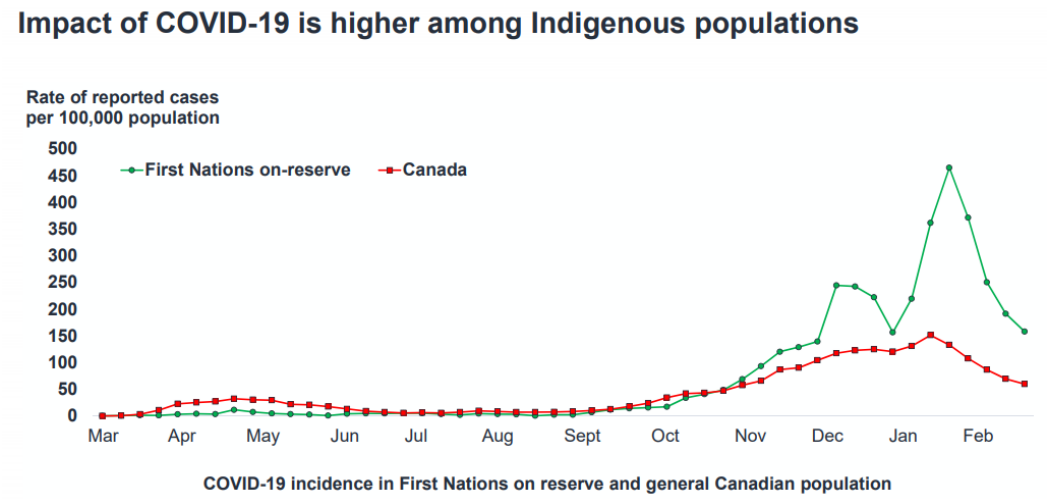

Figure 1. COVID-19 cases recorded in Indigenous communities in comparison to the general population as of February 2021 (Source: Public Health Agency of Canada)

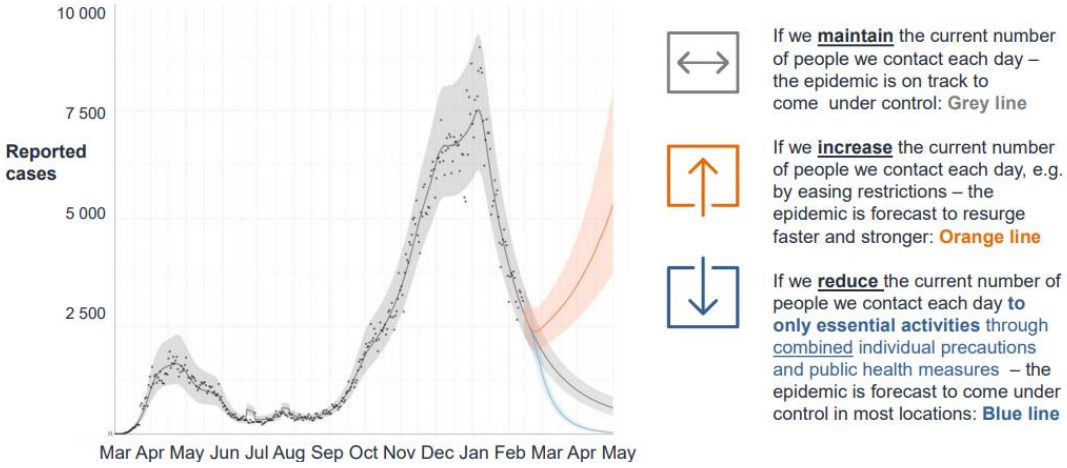

Figure 2. Long-range forecast modelling of Canadian COVID-19 cases as of February 2021 (Source: Public Health Agency of Canada)

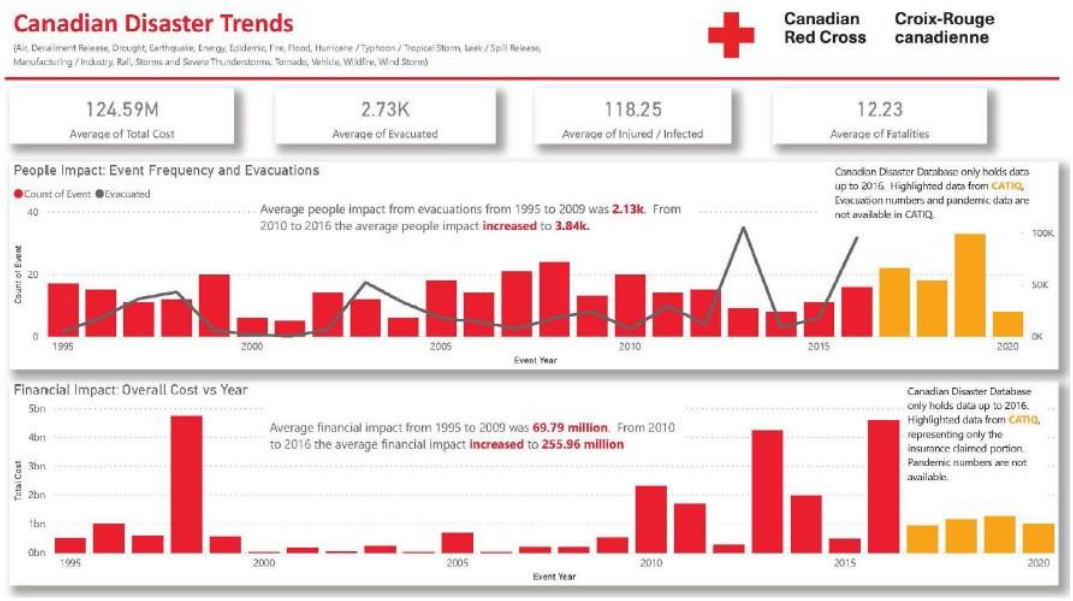

Figure 3. Disaster trends and future modelling of the Canadian riskscape (Source: CRC; Canadian Disaster Database 2021)

Coupled with persistent community spread, the projected impacts and compounding risk factors such as seasonal flooding and an increasing number of pocketed COVID-19 outbreaks, there is a recognized need to continue to build upon and maintain this strengthened national capacity to respond to our heightened risk environment. This will avoid key response actors from having to withstand continuous stand up/stand down cycles, which may limit a collective ability to respond in the context of increasing volume and intensity of events. These capacities will include but not be limited to conducting needs assessments, strengthening and augmenting local health services, strengthening local emergency and relief services, convening partners, supporting especially vulnerable populations such as the elderly through targeted post-pandemic recovery programming, and support coordination efforts, ensuring culturally safe spaces and services across the spectrum of responses. The following section details the method for formulating the CRC's adaptive response strategy, as well as detailing the individual components of the two-stream approach.

METHOD: FORMULATING AN ADAPTIVE RESPONSE

To reduce disaster and all-hazard risk while minimizing the negative impacts of the pandemic, leading world health authorities have postulated that national and international policies need to address contingency plans aiming to improve prevention, preparedness, mitigation, response and rehabilitation to new emergency events (UN Habitat 2020). In the initial stages of the pandemic and the request of national authorities such as the Government of Canada the CRC formulated an adaptive EM plan which aims to address both the COVID-19 pandemic as well as regular EM processes that occur in the country. To do this, first a literature review was conducted in relevant disaster management and pandemic management materials. This was sourced through keyword searches on platforms such as Google Scholar, using a combination of keywords used in conjuncture with one another such as "pandemic" and "adaptive emergency management". Similarly, official international and national advice was sourced through publications, statements and reports produced by credited world body's such as the World Health Organization (WHO). From this, researchers were able to manually analyze emergent themes and best practices which were the most likely to be beneficial to the Canadian riskscape.

Following this analysis, internal expertise from within the CRC was identified and leveraged. Employees with extensive skill profiles predominantly in emergency management (however also from a range of backgrounds for logistical purposes) collaborated to form an adaptive design plan. Employees originated from a variety of regional branches as well as from international and domestic operations teams, bringing in experience from the whole organization. Next, partners of the society were engaged for their own experiences and knowledge, adding another dimension of innovation to the proposed adaptive EM plan. Finally, lessons learned from other responses (such as military deployments into long-term care facilities) were fed back into the strategy and a progressive evolutionary method was used to continually adapt to the rapidly shifting situation. This process formed the two-stream strategy: the first stream targets supporting health surge capacity and pandemic control measures; the second targets surge support for natural disasters and more traditional EM delivered during the pandemic. While these streams have been broadly conceptualized as individual areas for the sake of clarity, it is important to note the relationship between the two is more complex. By this we mean that all health interventions among other relevant services are nested within wider EM. For example, repurposing EPC expertise practiced abroad to safe health procedures within long-term care facilities.

Supporting COVID Testing and Vaccination

The CRC has implemented a coordinated approach to provide immediate and scalable intervention to assist in filling identified gaps in the testing and vaccination programs of local health authorities. CRC teams have and will continue to be deployed to augment public health measures led by local and provincial government response structures. These structures and approach ensure coordination and integration with the site and local authorities. Service delivery is based on capacity to surge a range of services, including reinforcing service delivery in long-term care centers, deploying COVID Testing Assistance Response Teams (CTARTs) or vaccination support teams comprised of various profiles including MD and Registered Nurse clinical specialists, Public Health advisors, Emergency Care Workers, occupational health and safety (OH&S) leads, mental health and psychosocial support (MHPSS) and general leadership within an activation window of 24–72 hours. This model also ensures standardization in recruitment, onboarding and training, EPC protocols (i.e., proper zoning, PPE donning doffing processes), as well as protection of the health and safety of its personnel. Services in this area are;

Community Mobilization and Stakeholder Engagement

In consultation with various local, regional, provincial, territorial, federal and First Nations public health authorities, CRC has assisted (and continues to assist) in the design, coordination and implementation of programs, including the mobilization of community and their participation in response, distribution of information, navigation, and logistics support as required. With local teams and personnel already embedded in most communities across Canada, preexisting established relationships with government and community stakeholders leverage local salient knowledge in finding ideal linkages and audiences for engagement. This team coordinates efforts through a unified National Communications team, liaising through local resources to support enhanced awareness, engagement, and increased access and reach of public health information. These teams can consist of a variety of profiles including: Government or Community Liaisons, Communications Liaisons, Dynamic Media & Content Specialists, Provincial Government Relations Leadership as well as other media specialists as required. The team responds to Provincial EM Operations and Health Leadership.

COVID-19 Testing and Vaccination Site & Mobile Modules Support

The COVID testing assistance response team (CTART) provides both clinical and non-clinical support to manage and/or assist testing and vaccination sites. It also offers testing support at land-border crossing sites and scalability of mobile testing and vaccination efforts. As each region or local site presents unique needs, an advance team is

deployed in order to conduct a rapid assessment of needs inclusive of interviews with the health authorities in order to understand which services to activate, while assessing the location of the potential services, designing the CRC implementation approach and addressing current gaps along with epidemic prevention and control (EPC) recommendations and implementation measures, as well as consultative reviews of health and safety protocol adoption strategies as well as tailored site approaches to managing things like breaches in PPE protocols to ensure effective team safety.

Modules may include the establishment of stand-alone sites with CRC providing both personnel and materials including deployment of assets from its field hospitals augmenting public health care capacity. CRC also offers non-clinical personnel for reception, information, and site support including line-up management. Further, CRC developed vaccination modules with varying sizes and type applications to support ongoing vaccination. A Provincial Disaster Coordination Team (PDCT) provides oversight and support to both Field and Virtual Operations and includes the following profiles: An Emergency Health Director, EM Operations Leads, People Services support Leads, Logistics Leads, Planning Leads, People Services Leads, Risk Advisors, and Mental Health and Psychosocial Support (MHPSS) Leads among other support and administrative functions.

Teams deployed to support on-site operations can be formed from the following profiles: Public Health Advisors, Clinical Health Specialists including Doctors/Nurses/Lab Technicians, Community Liaisons, Site Managers, Generalists Responders (reception, information, distribution), Occupational Health & Safety Advisors, People Services Advisors, Logistics Specialists and other volunteer or auxiliary capacities as needed. Additionally, a Virtual Operations Team (VOT) supports call center operations, data management, support to information delivery, and referrals to ensure service escalations are prioritized based on beneficiary need. Off-site teams consist of the following profiles: Virtual Operations Team Site Managers, Supervisors, and Emergency Responders.

Research, Innovation and Evaluation Programming

The CRC will assist in the design and coordination of program implementation, mobilization of community participation, distribution of information, navigation support, and logistics support as required. As part of this initiative, the CRC also recognized the value in documenting the evolution of strategy throughout the pandemic. Finally, in collaboration with research partners, CRC has implemented information system and research-enabled programs that will allow capture insights in understanding and evaluating vaccination programming including its uptake, tiered release strategies, as well as its direct impact and timing on mitigating the spread of COVID-19. Data linkages between project-specific data collection and regional administrative data examine long term impacts of programs and their adoption rates. The team consists of the following profiles: Readiness planners, Data Analysts, Research Coordinators, and other necessary supporting information roles as required.

Supporting Outbreak Crisis Management

Areas of activation have included potential and full-fledged outbreak settings whereby individuals are in close proximity, including long term care facilities (LTC's) and correctional facilities. The objective has been for the CRC to enhance and maintain capacity to support a variety of urgent requests, such as the operation of isolation sites and quarantine sites for infected individuals, contact tracing follow-up in urban and rural communities alike in support to local health authorities. The deployment of field hospitals supporting existing facilities (e.g., at capacity ICU's, while offering psychosocial support and personal care services has remained an important feature offer to municipalities and provinces/territories. CRC capacity is based on providing support to provincial and territorial operations while maintain capacity to execute federal mandates concurrently as required. These mandates include:

Epidemic Prevention and Control (EPC)

The CRC recognizes a broad need across various institutional clients in Canada, beyond already-targeted groups such as Indigenous organizations, and long-term care facilities for expertise to prevent or contain the spread of COVID-19. CRC EPC teams conduct site evaluations, EPC assessments, and support EPC protocol implementation and compliance, providing technical advice to on-site and service delivery design. Public Health technical advisory services on Epidemic Prevention and Control (EPC) through Infection Prevention and Control (IPC) measures to support at outbreak sites, institutions and living environments like long-term care and correctional facilities. This service supports the safe adaption and implementation of IPC protocols and enhances the development and organization of a safe healthcare environment in the COVID-19 pandemic context. This service includes EPC rapid assessment, EPC enhancement (zoning, cohorting, improvement of donning/doffing, support IPC monitoring) and EPC training as a service. The service can be adapted to LTC, corrections

institutions, seasonal agricultural industrial and other workers setting, indigenous communities and other settings. The service can be focused on preparedness/ prevention and/or containment / mitigation of COVID-19 outbreak
Health Emergency Response Unit (ERU)

CRC maintains modular field hospital(s) that are warehoused and ready to be deployed on short notice to international or domestic emergencies. To date they have filled requests for field hospital modules in four provinces. These are mobilized in several configurations based on identified needs with assets pre-packaged in categorized kits that are dispatched from a central warehouse within 24-48h following a formal request. The team composition is tailored to the service package needed and includes pre-selected medical professionals who work alongside technicians and logistics professionals mobilized to support advanced planning, seamless integration and set up in existing health care settings. Front line service delivery need based and tailored accordingly.

Emergency Care Services in Living Environments

To ensure appropriate care remains in place in living environments such as Long-Term Care facilities, CRC employs a client-centered approach to strengthen the care team in assisting residents with the basic activities of daily living. Through this work, CRC fosters a mutually safe, trusting connection-based rapport approach through collaboration, communication, mutual understanding and respect.

Support to Contact Tracing

In support of federal and provincial tracing infrastructures and in support of local health authorities, CRC supports local and provincial capacities as requested supporting follow-up, investigation directly (in isolated community/facility), and can do so through virtual call center operations. CRC when requested plays a role in patient notification augmenting public health communication and advisement.

Emergency Relief Services for Isolated Canadians (including Financial Assistance)

As part of the relief effort, the CRC provides coordination support for emergency lodging, food, transportation and personal services where there is an identified gap in ensuring basic needs are met, including targeted financial assistance services - reflective of the collective needs of those impacted by the disruptive event.

Mental health and psychosocial support (MHPSS)

Psychosocial Support addresses the psychosocial needs of those affected and contributes to individual and community capacity. MHPSS aims to support those directly and indirectly affected by COVID-19 through enhancing resilience and coping, decreasing isolation, by providing connections and referrals, and direct emotional/psychosocial support, including considerations for gender, diversity and inclusion. The CRC ensures effective referral pathways and non-duplication of services, thereby enhancing efficiency.

Supporting EM Responses and Capacity

This section represents another stream of focus aimed at preparations to support more traditional all-hazards responses through existing and newly augmented disaster management structures keeping COVID-19 protocols in mind from planning through to activation phases – an integral aspect of reducing risk from all types of hazard and one which remains a core component of Red Cross societies globally. With more than 195 major disasters identified in the Canadian Disaster Database between 2008 and 2018, traditional EM similarly remains at the heart of CRC operations. Combined, these disasters have cost tens of billions of dollars in damages and have displaced hundreds of thousands of people.

In contrast to stream one, stream two is more dedicated to enhancing disaster response capacity and coordination, and fostering the development of new capabilities as a priority area of activity to strengthen Canada's overall resilience to disasters, especially in cases where they exceed the capacities of municipalities, provinces, territories, and First Nations communities alone. The CRC maintains disaster agreements with all provinces and 900 municipalities across the country and works in partnership with over 500 communities. Much of this programming can be facilitated remotely through online registration and distribution strategies, supported by Personal Disaster Assistance (PDA) teams or larger Emergency Response teams (ERTs).

During and after emergency events, the CRC provides emergency social services including: emergency lodging; reception and information; registration and mass financial assistance; emergency food; emergency clothing; family reunification; and safety and well-being support. The society maintains the ability to administer programs that provide wrap-around support using a case management approach to assist households, community

organizations and small business owners in their medium and long-term recovery from disasters and emergencies. The COVID-19 pandemic has evidently and significantly increased the complexities of these approaches, forcing the organization to develop a more robust, sustainable, predictable, virtual, and responsive surge capacity to respond to disasters; but it did not start from scratch in 2020. It's recent experience in complex disaster response included:

Disaster Financial Assistance

Following the Alberta fires in 2016, for example, the Canadian Red Cross was tasked with the role of distributing mass assistance through emergency financial transfers (EFTs). One year later during the 2017 British Columbia fires the CRC advanced $10 million in funds to meet immediate needs as the agency participated through partnership with the provincial government in a variety of initiatives early on. In both instances it began fund disbursements without a formalized agreement signed, nor an advance of funds. This underscores the need to invest in response capacities and structures prior to events to support rapid action.

Increasing Volunteer and other emergency Surge Capacities

As the country's largest voluntary sector organization there is an opportunity to build on the momentum and create an enhanced emergency response surge capacity, in many cases capitalizing on specialized and professional workforces, that can be maintained post-COVID for future disasters and crises. For example, at the request of Health Canada and the Province of Quebec, the CRC first operationalized volunteers and other personnel recruited through government programs and campaigns for emergency care work. On a pan-Canadian level, the CRC has built a large humanitarian workforce comprised of health, operational leadership and support experts available to rapidly respond to requests for support from public authorities. The remaining sections of this paper report on the results, conclusions, limitations and future work to date.

RESULTS & CONCLUSIONS

The services and roles that the Canadian Red Cross (CRC) have designed and implemented in partnership with federal, provincial, territorial, local and Indigenous partners, in response to the COVID-19 pandemic, have so far been met with measurable success. In stream one, for vaccination and testing purposes, the CRC has been able to provide timely intervention assistance to local and public health authorities. Furthermore, in a range of provinces and territories the society has become valuable in distributing, information, navigating support, leveraging supply chains, and doing so as a trusted partner, living up to its mission statement, its auxiliary to public authorities role, and fundamental principles within the Canadian riskscape. Deployed CTART teams have enhanced overall public health readiness posture by providing both clinical and non-clinical support to assist testing and vaccination sites along with scale up of mobile testing efforts. This has positively impacted Canadian communities, but particularly those more isolated, such as in First Nations communities. Furthermore, it has consciously invested in documenting and researching cumulative efforts in real-time during the unprecedented response, so as to learn from and adapt to challenges in, while collecting a valuable resource dossier of academic resources that may foster a beneficial dialogue between humanitarian organizations across EM as well as global health response practitioners.

Modules of the Emergency Health Unit (ERU) staff and stock deployed to initially support quarantined travelers, and then later deployed to support Vancouver Coastal Health (VCH) Authority and Health Emergency Management BC (HEMBC) in the installation of a temporary 100-bed Severe Acute Respiratory Infection (SARI) treatment facility to Edmonton intended to provide medical services to COVID-19 patients. ERU deployments continued to rise in number during the second wave of the pandemic in Canada, particularly in the regions of Quebec and Ontario. In these deployments the CRC has therefore had a positive impact in augmenting capacity to established facilities or providing standalone capacity where requested in separate overflow facilities. The CRC have also provided Personal Protective Equipment (PPE) and Preventing Disease Transmission Training in support of front-line staff and volunteers across a variety of facilities including border operations, corrections facilities, and long-term care homes for example. To ensure that local community organizations can continue delivering vital services during this pandemic, the CRC offers an innovative tailored-to-site Preventing Disease Transmission Training program (PDT). This program supports charitable and non-profit organizations undertaking direct service delivery by providing training to volunteers and staff on use of personal protective equipment and infection prevention. Furthermore, protocols on PPE usage devised by the CRC have been distributed to other global Red Cross societies. Currently, the CRC has deployed over 56,000 emergency response stock items and over 66,000 PPE nationally.

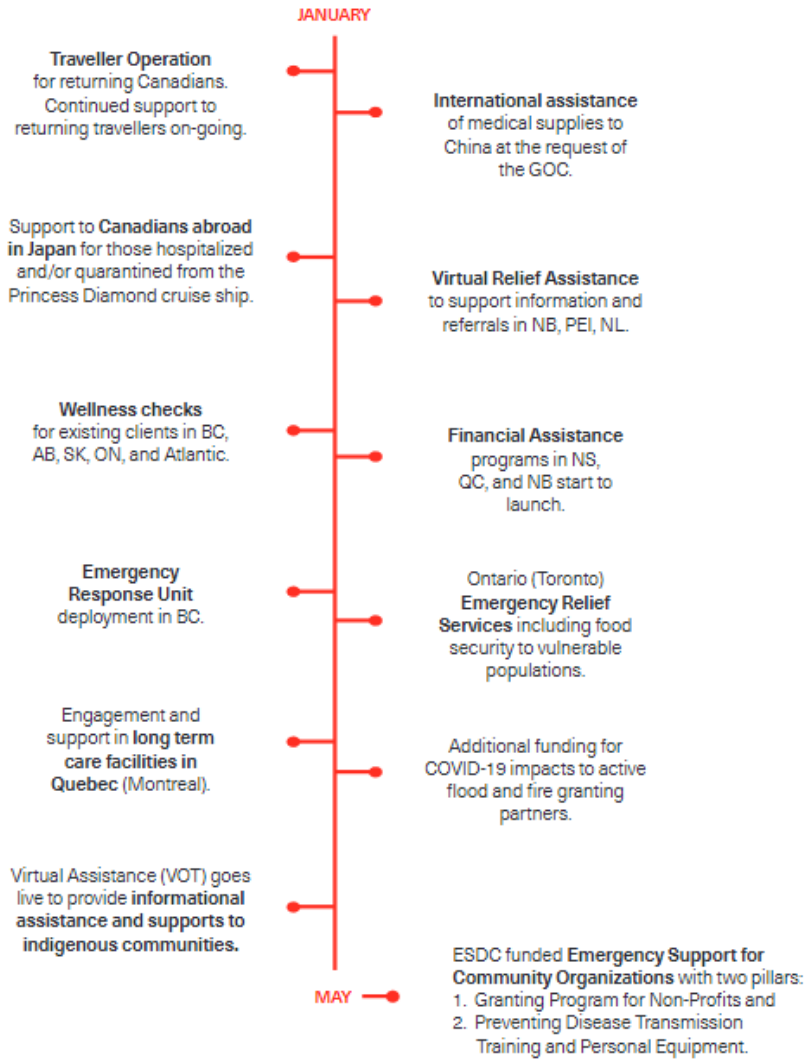

Figure 4. A Timeline of CRC services and roles during the COVID-19 pandemic from Jan-May 2020

In addition to the services and roles explained previously, the CRC have been able to design, implement and/or enhance further service offerings. These have been constructed to support the pandemic-driven services through local and provincial health authorities, in a combined effort to ensure Canadian citizens face lower levels of risk with regards to infection, prevention, and control. Firstly, financial assistance has been made available to individuals to partially alleviate the burden of unplanned additional expenses to address immediate needs as necessitated by the emergency or to contribute to other unexpected costs as a result of the impact. As of September 2020, over 445,000 individuals registered for relief assistance and over 236,0000 households. A further 2242 travelers have also been supported to date. Mass Financial Assistance is typically targeted to individuals and families impacted by isolation and most in need. These funds are also available and tailored to meet specific needs of community based not-for-profits and small businesses facing challenges trying to remain solvent while bearing the costs of adapting and continuing to deliver critical goods or services locally.

The Community Partnerships Program (CPP) is a grant driven program which provides funding to community organizations, enabling them to address community needs while prioritizing building resilience. This is a Pan-Canadian program with a localized approach leveraging the local connectivity of our over 300 branch offices across the country ensuring community needs are met. This program includes an educational component to support more effective recovery. In the context of COVID-19 the CRC supported over 1,000 local agencies amounting to over $56 million of financial assistance provided on behalf of provincial partners to those in need of urgent financial relief as of September 2020. Furthermore, 126 LTC sites have been supported nationally.

Secondly, virtual relief services have been enhanced to host relevant information and referrals to established community resources. In this capacity, CRC acts as a connector between beneficiaries and government & community resources while mitigating the negative consequences related to misinformation and stigmatization.

For beneficiaries calling with urgent unmet needs, an escalation process is initiated to ensure client needs are met through further triaging and referrals to both internal and external appropriate resources. Since September 2020 over 158,000 incoming calls have been received across Red Cross Call Centers. This figure does not include outbound friendly calls in support of those in self-isolation and quarantine. Thirdly, the CRC is able to register individuals requiring assistance by conducting wellness checks through non-medical needs assessments (virtually or in-person, when following IPC protocol), if required, and provide relevant information and/or referrals. This is often the first step in assisting those impacted and enables the provision of services, by targeting, proactive and responsive communication messaging, with impacted populations.

In stream two, the CRC has been able to leverage its experience in humanitarian response and preparedness, at all levels with particular expertise in previous operations supporting Indigenous communities across Canada (for example, refer back to the Indigenous Communities Framework approach. It combines to contribute to collective efforts to reach the ultimate outcome of reducing COVID-19 morbidity and mortality among Indigenous communities in Canada, by ensuring that all COVID-19 response services take into account existing and emerging needs while delivering services in an appropriate, invited, and thoughtful way that addresses commitments to cultural safety and the principal of "Do no harm". The CRC response to the pandemic has been built upon existing relationships and capabilities in order to provide support by addressing three main pillars: (i) risk reduction, (ii) promotion of health services, and (iii) linking community and individuals to virtual support. In conjunction with these initiatives, the CRC has been able to leverage increased volunteer capacity as it has prioritized the standing up of a "Civilian Humanitarian Workforce" program designed to help better surge local capacity with pre-trained and certified expertise. However, due to its complexity, size and substantive rationale this program will be unpacked and discussed in a future paper.

Ultimately, the COVID-19 pandemic has demonstrated that emergency management and health interventions are two areas that are becoming ever more inextricably intertwined. Consequently, an increasing amount of focus needs to be placed on streams one and two, while more importantly making sure that they can complement one another. This approach avoids detrimental tendencies towards duplication of efforts, isolationism, and barriers to collaboration. Following this shift in perspective will reduce future risks both in the Canadian riskscape, but also globally should other organizations, practitioners and humanitarian societies continue to enhance their own emergency and health responses collaboratively. Though organizing through centralized mechanisms allows for efficiency, consistency, and evidence-based quality improvement metrics, it is important that programming development needs still address the nuances of case-by-case applications through all levels. The CRC will continue to promote, adhere to and support international calls from global authorities such as the World Health Organization in its efforts to implement innovative initiatives. Gathering and distributing knowledge among a wide array of government partners and humanitarian actors will ultimately help reduce risk as we face inevitable increases in future hazards and health phenomenon; not only in Canada but around the world.

CHALLENGES AND FUTURE WORK

While this paper has reported on the successes of the CRC, it is important to acknowledge that, given the scale and complexity of the adaptive EM strategy for response during a pandemic, it is natural that there are challenges to overcome and future work to establish. A predominant challenge is that there are few modern day parameters to compare against what has been done in previous examples, such as during SARs or Ebola. This is due to the rarity of the phenomenon, but also the opaqueness of humanitarian organizations detailing their response strategies. Learning from this, the CRC intends to re-evaluate and validate the strategy illustrated in this paper over the coming 6-12 months as vaccination efforts continue to unfold. This will involve conducting an impact assessment of the two-stream approach, in addition to the collection and analysis of staff and collaborator feedback surveys and interviews. Moreover, additional parameters to measure the expansion of the organization - such as the application of theoretical frameworks – will be researched and employed. This may further validate the results of the strategy, highlight other limitations and ensure that the gap in research is sufficiently addressed for future pandemics.

Due to the nature of emergency response, challenges often only become apparent throughout various different stages of their execution. Limitations therefore can be revealed throughout the application of a strategy or in response to new triggers or complications. For example, as a result of participating in some of the first operations supporting expats returning from the Wuhan Province in China, it was clear that many unknowns existed, and that the one thing the CRC could focus on would be to further develop and reinforce initiatives like the approach to Epidemic, Prevention, and Control expertise (EPC). In so doing, they sourced a workforce that was recruited, trained, and onboarded to be ready for deployments across a variety of operations that the organization had not yet fully imagined. It was then clear that having developed a workforce, there remained challenges in their sizing, forecasting, training, payment and scalability. These were overcome through constant re-evaluation of strategy implementation and successive pivots to new services and needs as they emerged. Despite this, the workforce

service offerings were adapted and made transferable, while new specialized applications to domestic operations such as EPC were formulated and remain critical within the Canadian riskscape.

The future of the adaptive strategy appears to be promising. Since its 6-month operational pilot, the CRC has been able to increase its support and service offerings across Canada through generous donations and government funding while continuing with missions abroad (see for example December 2020 ERU deployment for flooding in Honduras). They have also expanded existing data management tools, adopting or enhancing existing use of technology like Zoom, Smartsheet, and Microsoft cloud-based products now ubiquitous in the corporate sphere. The adoption and maintenance of various cloud-based platforms at times lagged in performance when too many users were accessing data-heavy functions simultaneously. As with maintaining any type of similar application, the amount of manual time required from people charged with the tool's oversite (inputting, managing, and updating data to populate for example personnel's status to deployable, "ready", availability surveys, training modules, personal information, etc.) is significant and requires constant resourcing. Unlike newer cloud-based database platforms where users are able to update their own profiles at their leisure, schedule themselves into operations, and quickly access requisite trainings, the organization found its strength only through combining manual inputs with automated processing, where with some upfront manual data manipulation, applications could only then magnify work output exponentially. Working across two different languages requires further refinement of tools and operational considerations (more relevant to the Canadian riskscape considering its dual national languages).

While some of these platforms were initially seen as temporary solutions, their widespread adoption and overall advantages to workflow became visible. Through these iterative large-scale shifts in modes of operation, supporting the rapidly formed specialized workforce (a concept which will be introduced in further papers), became not only an imagined possibility but a reality born out of necessity. Foundational key stones laid over decades of direct engagement with the Canadian public allowed the structural walls of the organization to absorb the ground swell of new personnel without compromising or collapsing the critical infrastructure of ongoing operations. This increased the organization's reach and capabilities, as newly acquired external professionals not only helped staff the initiatives, but also shaped their ultimate delivery models. Moreover, the tools that helped facilitate iterative change were introduced in such a way that they complimented and worked within existing infrastructure; or in some cases supplanted products that were quickly recognized as somewhat inferior in user-experience. Tapping into the strategy's inherent agility has increased expertise in new tools and software that the CRC predicts will be valuable in future developments, and to all actors involved in adaptive responses during the COVID pandemic – as well as future phenomenon.

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