LESSONS FROM NORTHERN ONTARIO:

Rural-proofing emergency management in Canada

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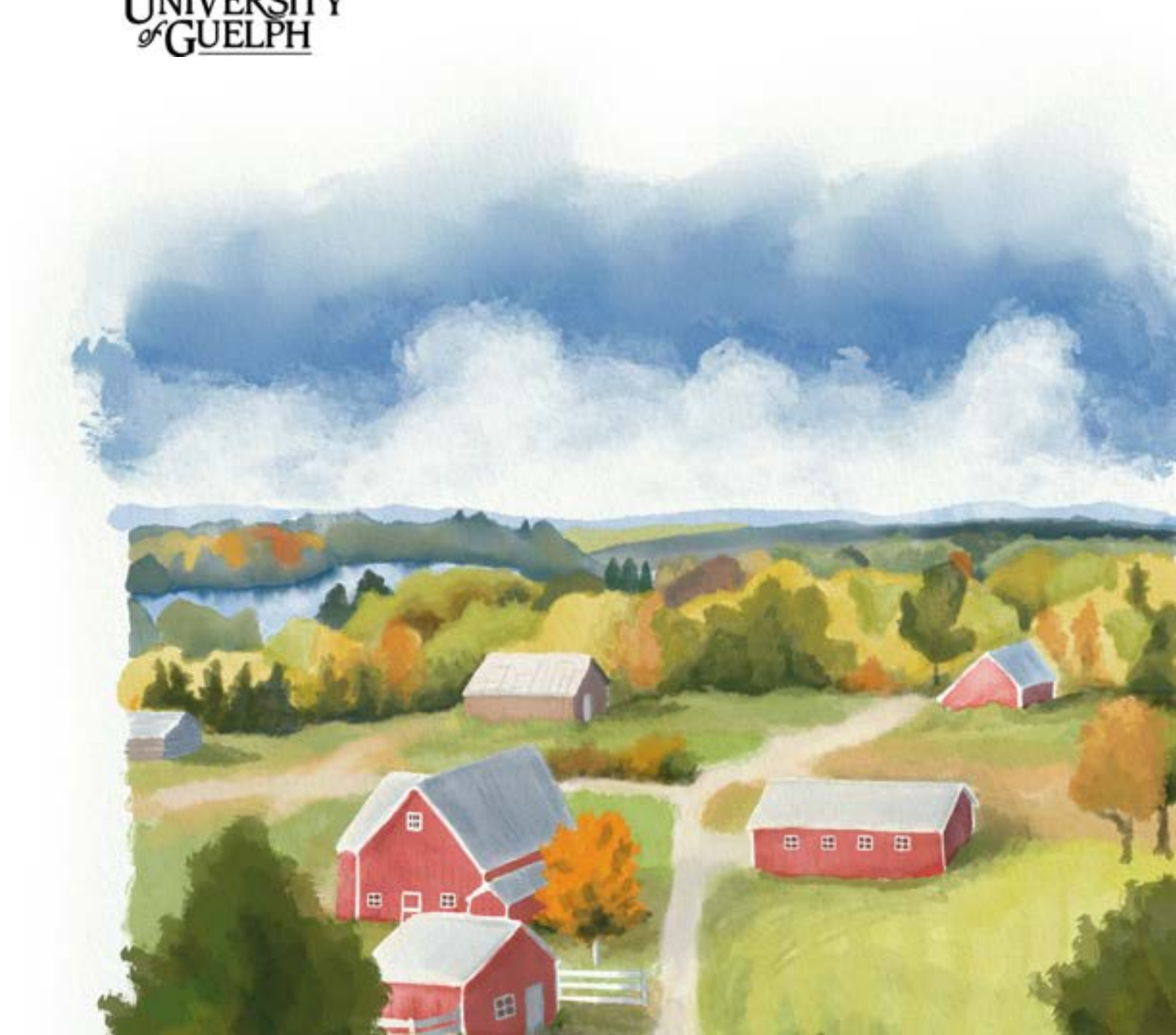

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Much of the knowledge on which this project is based excluded Indigenous and other important perspectives. The structures and systems in which this project is situated are themselves legacies and supporters of colonialism, and through this project we commit to identifying and seeking transformation of these systems.

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Township of Black River-Matheson
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PREFACE

This report was written during the summer of 2024, in rural Northern Ontario, amid various disruptions: a global Internet outage affected local hospitals, Toronto experienced severe flooding, several extreme heat events occurred, local events were cancelled due to extreme weather, and the country mourned the devastating fire damage in the rural community of Jasper, Alberta.

These disruptions are now the norm, making this report feel long overdue. Our report reiterates what many others have written: the need to integrate health promotion into emergency management, recognize the prevalence of social emergencies, and focus more on reducing risks and vulnerabilities.

We hope this report adds new voices to the calls for change and provides insights useful to rural Canada, which is greatly affected by disruption yet often sidelined in national discourse.

This report emphasizes accepting change as a regular, even desirable, aspect of life. Ulrick Beck theorizes about an essential global metamorphosis driven by today's dire realities. The arts project Dear Climate calls us to befriend these changes to better understand and appreciate our best path forward. Rural communities, rich in complex history and ever-changing, captivate with their beauty, inventiveness, peace, industrialism, art, resilience, and ruggedness. Though they may seem isolated, rural places are deeply connected to global forces. By accepting disruption as inherent to daily life, we can better embrace the changes needed to navigate it.

This report examines the COVID-19 pandemic's massive disruption and learns from rural Northern Ontario's experience—what it gave, what it took, how we responded, and how we grew. It is a small part of our collective recovery and aims to scale in, to then scale out: to explore deeply what happened, to then consider how we can all incorporate these lessons into our ongoing journey through change.

INTRODUCTION

Emergencies are happening more frequently and with increasing impact.[1,2,3,4] Hazards that affect communities across Canada related to viruses, economics, extreme weather, and social emergencies affect rural communities differently that their urban counterparts, and in addition, rural Canadian communities often face "natural hazards" (e.g., forest fires, landslides, and floods) more often.[5]

Early COVID-19 pandemic research highlighted the insufficiency of Ontario's emergency preparedness for such events.[6] Although the response prevented the health system's collapse and virus-related deaths, it also resulted in significant health, social, and economic consequences for individuals, families, and communities.[7,8] The COVID-19 virus led to a synergistic epidemic, or syndemic, where pre-existing health, social, and environmental inequities proliferated alongside infectious diseases.[9,10] More broadly, we are now in a poly-crisis, with intertwined global crises of economic, peace, health, and climate considerations.[11] These overlapping emergencies strain resources and physical and mental health, making prevention and minimization of emergencies crucial for fostering overall health.

Our current emergency management approach is insufficient. Had we been better prepared for the pandemic many impacts could have been avoided. A new approach is needed that emphasizes health and wellbeing, acknowledging disruption is inevitable in our social and governance systems.[3] The response resulted in business closures, an exodus from the health workforce, and lasting population impacts.[12,13,14] Despite these impacts, society seems to have moved as quickly as possible to its pre-pandemic way of being. A different approach is needed, one that widens the lens. In this project, we consider disruption an inevitable phenomenon that requires accommodation within our governance and social systems and zoom out from emergencies themselves, to set our sights on health and wellbeing.

There is widespread encouragement to adopt place-based approaches in Canadian rural policy[15,16,17], including calls to leverage rural assets and strengths.[18,19] Rural proofing, which applies a rural perspective to policy, works best when it encourages collaboration across government levels and departments.[20]

A growing and diverse body of research has examined the pandemic and its effects (e.g., [6,8,21,22,23,24]). In her 2021 report *A Vision to Transform Canada's Public Health System*, Canada's Chief Public Health Officer drew attention to the health and social consequences of the pandemic and identified four priority action areas for public health renewal in Canada related to workforce, tools, governance models, and funding.[25] The following year, in *Mobilizing Public Health Action on Climate Change in Canada*, she drew attention to the systems change needed to respond to this global problem.[26] In 2023, *Creating the Conditions for Resilient Communities: A Public Health Approach to Emergencies* highlighted opportunities for health promotion to contribute throughout the emergency management cycle.[27] This report validates and responds to these priorities through place-based research in rural Canada.

This project used the COVID-19 pandemic as a case study to reflect on and envision changes in our approach, specifically for rural Canada. It presents findings from a two-year qualitative research study in rural Northern Ontario, Canada, including an overview, discussion of implications, and recommendations for action. Although conducted in rural Northern Ontario, this project aims to provide insights applicable to rural communities across Canada.

EXECUTIVE SUMMARY

This two-year research project aimed to learn from the COVID-19 pandemic experiences of public and non-profit sector actors in rural Northern Ontario communities to strengthen resilience and minimize the impact of future disruption. The report, informed by a literature review on governance for health and wellbeing, document reviews, interviews with municipal elected leaders and staff, local public health agencies, and other organizations, and a participatory workshop, provides recommendations to enhance rural communities' responses to future disruption.

Rural communities have unique governance realities, social and ecological conditions, and experiences with hazards, necessitating rural-specific approaches for effective emergency management. Additionally, decisions and engagement in emergency management are often influenced by the knowledge and beliefs of individuals involved. These individual factors are crucial to consider in the context of high stress and rapid decision-making. The research showed that, even in rural Northern Ontario, information, ecological, and economic systems are influenced globally, and by national and provincial government decisions. It revealed a gap between research literature, federal and global governance priorities in emergency management, and local implementation. This research found inconsistent understanding of the emergency management cycle and uneven participation across its phases, with a focus on preparedness and response over prevention, mitigation, and recovery. It also revealed a mismatch between the tools used in emergency management and the actual needs of prolonged emergency response.

These findings suggest four areas for intervention: understanding emergency management, helping rural communities thrive, encouraging full participation in emergency management, and addressing the mismatch in emergency management tools to the characteristics of current emergencies. Recommendations to address the research findings are based on those made by participants at an in-person workshop in Sudbury, Ontario, in May 2024, complemented with recommendations made throughout project interviews and informed by a review of the literature. The following are recommended to strengthen rural communities' ability to respond to future disruption:

1. Clarify Emergency Management Framework

- **Review and standardize documents:** Review and standardize emergency management documents to ensure clear definitions and consistency for each phase.
- **Integrate social emergencies:** Include social emergencies in the existing emergency management framework.
- **Define roles clearly:** Clearly outline the roles and responsibilities of everyone involved, including local public health agencies, municipal governments, and non-profit organizations.

2. Increase System Capacity for Emergency Management

- **Continuous training:** Regularly update and deliver training on the entire emergency management cycle, focusing on decision-making, risk communication, healthy public policy, and health inequities. Improve health and social media literacy.
- **Centralized support for rural communities:** Provide centralized resources, expertise, and a deployable team to assist rural communities during crises. Strengthen policy support for municipalities.
- **Reform funding:** Redesign funding models to encourage collaboration, reduce barriers for small communities, recognize higher costs in rural areas, and allow flexible access to loans. Ensure ongoing funding for rural emergency management, including dedicated roles, infrastructure, and investments across all emergency management phases.
- **Whole-of-society approach:** Engage civil society as active participants in emergency management.
- **Strategic communications:** Standardize communication tools and language, build trust in spokespeople, use diverse channels, and ensure consistent messaging. Provide accurate, locally relevant emergency information to the public.
- **Legislative support:** Strengthen local public health initiatives, expand the Emergency Management and Civil Protection Act to incorporate additional partners and phases, and ensure compliance with the Ontario building code regarding fire and safety standards.

3. Enhance Understanding of Rural Emergency Management

- **Specialized training for rural contexts:** Develop training programs that address the unique challenges of rural emergency management. Ensure that regional and provincial actors understand these specific issues.
- **Promote regional collaboration:** Create a regional emergency management community of practice to share skills, experience, and knowledge. Conduct joint exercises and use shared Community Emergency Management Coordinators, taking a multi-community approach.
- **Strengthen networking and communication:** Foster regular networking and information exchange among organizations to build relationships, understand rural needs and strengths, and improve emergency management effectiveness.

4. Modernize Emergency Management Strategies

- **Integrate asset-based approaches:** Use asset-based and strengths-based methods throughout the emergency management cycle.
- **Include an Indigenous lens:** Support local Indigenous organizations, consider the impact of hazards and emergencies on Indigenous people and on the land.
- **Prevention:** Invest in factors that reduce vulnerability, such as transportation, housing, healthcare, and Internet access. Promote healthy environments and support local efforts on issues like climate change. Encourage communities to identify risks and prioritize prevention in Community Safety and Well-Being plans.

- **Mitigation:** Include social risks and vulnerabilities in risk assessments, considering impacts on individuals, communities, societies, and ecosystems. Ensure mitigation efforts address these risks at all levels.
- **Preparedness:** Plan for community-specific needs during emergencies, like transportation and healthcare, and anticipate supply chain challenges. Engage vulnerable populations in planning and share plans with the community. Regularly conduct exercises with diverse partners, focusing on complex scenarios, and practice using response tools like the Incident Management System.
- **Response:** Adapt regional or provincial strategies to rural community characteristics. Update tools to: address complex emergencies, facilitate diverse perspectives, identify and mitigate short- and long-term consequences of response measures, support learning and reflection, adapt to varying levels of participation and knowledge among participants, and address power dynamics and equity issues.
- **Recovery:** Require debriefing sessions and thorough documentation of lessons learned. Conduct collective debriefs across organizations or regions to promote shared learning and improvement.

This report presents findings from a place-specific case study in rural Northern Ontario, that may resonate with other parts of rural Canda. Findings point to opportunities to strengthen community resilience through conceptual clarity, resource development, and pragmatic action. While derived from a place-specific case study, the recommendations presented here are likely to be compatible with the experiences of rural communities elsewhere in Canada and helpful in building a broader rural-proofed Canadian policy agenda.

KEY CONCEPTS

Rural: For this study, rural communities were those with fewer than 10,000 people. However, definitions vary. Rurality generally includes social and geographical dimensions like population density and distance from a city.[18,20,28,29,30,31,32] Rural communities are also often characterized by complex connections between humans and ecosystems.[33]

Change/Disruption: Systems are always in flux, and rural communities are systems. Change can happen gradually or suddenly, sometimes causing a disaster. Health theory assumes change,[34] as do Indigenous knowledge systems.[35]

Emergency: "A present or imminent event that requires prompt coordination of actions concerning persons or property to protect the health, safety or welfare of people, or to limit damage to property or the environment."[36(p21)]

Syndemic: Synergistic epidemic, where pre-existing health, social and environmental inequities proliferated alongside infectious diseases.[10]

Poly-Crisis: Entanglement of globally occurring crises related to, e.g., economy, society, health, climate.[11] Impacts of the poly-crisis are felt at the local level.

Hazard: "A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation."[36(p22)]

Risk: Risk is the combination of the likelihood and the consequence of a specified hazard being realized; it refers to vulnerability, proximity or exposure to hazards, which affects the likelihood of adverse impact.[36] Risks today are complex, unpredictable, and transcend borders, and how we understand risks impacts how we address them.[37] Despite this, we often shift responsibility to individuals, which not only prevents us from properly addressing these risks but leads some people to adjust differently to the risk which then worsens health inequities.[38]

Resilience: Community resilience is the idea of bouncing back after disruption.[39-41]

Adaptation: Incremental change in response to changes happening elsewhere within a system.[39]

Transformation: Deep, structural change in response to changes happening elsewhere within a system—often, change into something different.[39]

Health Promotion: "The process of enabling people to increase control over, and to improve, their health."[42(p1)] Health promotion recognizes fundamental conditions for health: peace, shelter, education, food, income, a stable eco-system, sustainable resources, social justice, and equity, and has three core functions: to advocate for conditions that support health, enable people to reach their health potential, and mediate among actors across society to support health. Five strategies are used: strengthen community action, develop personal skills, create supportive environments, reorient health services, and build healthy public policy. The concept has evolved with emphasis on, e.g., international cooperation in health promotion,[43] equity,[44] and planetary health.[45]

Asset-Based Approaches: The asset-based approach is positively framed. [46,47] It highlights individual strengths as well as organizational and environmental resources necessary for promoting physical, mental, and social health, employment security, housing, political democracy, and social justice.[47,48] The asset-based approach focuses on how health can be "co-created rather than how it can be fixed."[47(p9)]

Emergency Management: A framework used in Canada to describe the phases of preventing, mitigating, preparing for, responding to, and recovering from emergency. The emergency management cycle has up to 5 phases:

- **Prevention:** stopping an emergency from happening (Ontario); preventing or reducing the impacts of disasters (Canada)
- **Mitigation:** reducing the impacts of an emergency that cannot be prevented
- **Preparedness:** ensure the ability to prevent, mitigate, respond to, and recover from an emergency (Ontario); efforts taken prior to an emergency to help support response, help reduce impact of events and identify opportunities for future prevention and mitigation (Canada)
- **Response:** managing the consequences of an emergency immediately before, during and after the emergency has occurred
- **Recovery:** the work of restoring to pre-disaster or higher level of functioning

Disaster Risk Reduction is an approach to the prevention and mitigation phases of emergency management, " a systematic, whole-of-society approach to identifying, assessing and analyzing the causal effects of disasters and reducing the risks and impacts of disaster based on risk assessments."[49]

Social ecological model identifies levels at which health is shaped: individual, family, institutional, community, society, and ecosystem. Promoting health in a community involves addressing factors at each of these levels.[50]

Social-Ecological Model

Adapted from McLeroy, Bibeau, Steckler, & Glanz, 1988

Power: Power is important to foreground in emergency management. For example, expertise or best practices help inform many decisions, but these can have built in biases because of the type of knowledge they incorporate and the fact that many people don't have access to the resources to contribute to that knowledge.[51,52] People with power will tend to use their influence to protect their interests. Emergencies are often accompanied by power-influenced issues of disaster capitalism and corruption.[41]

Systems thinking: Thinking analytically to better understand how systems work, predict what they will do, and make changes to get the results we want, or to study patterns in large complex systems to anticipate and design for changes that we want.[53,54,38]

Conceptual Model

This research is based on a model that brings together several ideas about how communities govern for health and wellbeing.[55]

The model shows that health governance happens at different levels—local, provincial/territorial, federal, and Indigenous—within the social-ecological system.

It highlights how factors like power, risk, accountability, and deliberation shape health decisions. It also stresses the need to prioritize equity, the common good, and principles of truth and reconciliation.

The framework sees disruption as a natural part of rural governance and aims to build resilience, adaptability, and transformation when needed.

Lastly, it values creativity, collaboration, and continuous capacity building in rural health governance.

Conceptual Framework for Governance of Health and Wellbeing in Rural Communities

Adapted from Mongeon, Deacon, & Mulligan, 2023

CONTEXT

Northern Ontario

- 88% of the province's land mass with 6% of the population[56]
- Population: 789,519[56]
- Land mass: 787,308 km^2 [56]
- Lifespan average 2.5 years lower than in Southern Ontario[57]
- 12% Low income in Northern Ontario vs 10% Ontario[56]
- Fewer doctors per capita than in Southern Ontario[57]
- Lives are shaped by issues of weather, infrastructure, and location[57]
- Digital disparities: 73% of Northern Ontario households have quality broadband vs 93% in Ontario; Excluding the 5 largest cities, only 52% have access[58]
- 17% Indigenous population[56]
- 14% francophone population[56]
- 7% mother tongue other than English or French[56]
- 6% immigrants to Canada since 1980[56]
- 64% with high school diploma or equivalent vs 69% for Ontario[56]
- Municipalities >10,000 =7 (largest is City of Greater Sudbury (170,000)[56] Municipalities <10,000=137 (smallest is Cockburn Island (16)[56]
- All single tier municipalities
- Public health is managed regionally, with local governance representation and local service and program delivery

COVID-19 in Rural Northern Ontario

The first case of COVID-19 was reported on January 25, 2020, with Northern Ontario's first case confirmed on March 7. By the end of March 2020, each Northern Ontario health unit had reported a case, all linked to international travel. Ontario declared a state of emergency and put province-wide protection measures in place in March 2020. These evolved to a mix of provincial, federal, and regional measures over two years and six pandemic waves.[59]

During the first wave of the pandemic, protection measures were province-wide but shifted to a regional approach, determined by public health unit areas, as waves receded. From the second wave in fall 2020, responses mixed province-wide and regional measures, with local Medical Officers of Health having the authority to override provincial measures under the Health Protection and Promotion Act.[60] The Northern Policy Institute's report, *The Impact of COVID-19 on the Economy of Northern Ontario*,[61] provides further detail on public health measure variations in Northern Ontario. For a detailed overview of interventions during this period, see the *Canadian COVID-19 Intervention Timeline*.[59]

With control measures rooted in the authority of local Medical Officers of Health, local public health units managed incident command for their regions, which included both rural and urban populations. For example, Northwestern and Timiskaming Health Unit areas have highly dispersed populations (Northwestern's largest municipality: 14,967; Timiskaming's: 9,634)[56]. Other Northern health unit areas feature one larger centre each: Sault Ste. Marie (72,051), Timmins (41,145), Greater Sudbury (166,004), Thunder Bay (108,843), and North Bay (52,662)[56], all relatively small compared to their Southern counterparts.

The timing and severity of the pandemic waves varied in Northern Ontario compared to the South, with a lower fatality rate in the North. There was also regional variation within the North, with some health units experiencing significantly more cases than others.[61]

Key emergency management documents and legislation in Ontario, Canada, and beyond

Global:

- Sendai Framework for Disaster Risk Reduction 2015-2030 (2015)[62]
  - Canada is a signatory
  - Aims to reduce disaster risk and associated loss
  - Recognizes shared role of governments, private sector and others

Canada:

- Emergency Management Strategy for Canada: Toward a Resilient 2030 (2019)[63]
  - Developed by federal, provincial, and territorial emergency management leaders
  - Translates Canada's commitment to the Sendai Framework into guidance for use across Canada
  - Endorses as Disaster Risk Reduction (DRR) approach
- An Emergency Management Framework for Canada Third Edition (2017)[36]
  - Presents emergency management in 4 phases, combining prevention and mitigation. Defines prevention as preventing exposure to risks rather than preventing emergencies themselves
  - 3 of 5 priority areas in Canada's framework link to hazard identification and mitigation: "Enhance whole-of-society collaboration and governance to strengthen resilience"; "Improve understanding of disaster risks in all sectors of society"; and "Increase focus on whole-of-society disaster prevention and mitigation activities"
- Advancing the Federal-Provincial-Territorial Emergency Management Strategy: Areas for Action (2024)[64]
  - Identifies federal government actions to address the priority areas in the Emergency Management Framework for Canada
- Creating the Conditions for Resilient communities: A public health approach to emergencies (2023)[28]
  - 2023 Chief Public Health Officer of Canada report
  - Describes link between emergencies and health, argues for applying a health promotion approach to emergency management

Ontario:

- A Safe, Practiced and Prepared Ontario: Provincial Emergency Management Strategy and Action Plan (2023)[65]
  - Emphasis on preparedness and response
  - Defines preparedness differently, as precursor to all the other phases: "preparedness ensures the ability to prevent, mitigate, respond to, and recover from an emergency."
- Emergency Management and Civil Protection Act[66]
  - Mandates municipal action related to mitigation, preparedness, response and recovery
- Being Ready: Ensuring public health preparedness for infectious outbreaks and pandemics (2022 Annual Report of the Chief Medical Officer of Health of Ontario to the Legislative Assembly of Ontario)[67]
  - Emphasis on community readiness/resilience, and societal readiness—engaged informed prepared society whose citizens have the trust, knowledge and support to protect themselves and others

LEARNING FROM COVID-19 IN RURAL NORTHERN ONTARIO

PROJECT OVERVIEW

This two-year research project delved into the experiences of seven municipalities in Northern Ontario, each with populations under 10,000, and included a document review, key informant interviews, and a participatory workshop. We reviewed council meeting agendas and minutes for the first six waves of the pandemic, to learn how the pandemic manifested for them, from a governance perspective. Themes from the document review informed interviews with elected representatives and staff at these same municipalities. Analysis of these interviews then informed interviews with representatives from organizations that also shaped the local pandemic experience—local health units, a non-profit organization, a community health centre, and a municipal association. Analysis of these interviews identified four potential areas for action to support rural communities in responding to disruption. All interview participants were then invited to attend an in-person workshop, where these action areas were explored, and recommendations made to address them. The detailed methodology is described in Appendix A.

Participating Municipalities

Name of Municipality	Population (2021)	Distance from an Urban Centre	Population Density per Sq. Km	Health Unit Area	Declared an Emergency? (Y/N)	Council
Black River-Matheson	2,572	69km (Timmins)	2.2	Porcupine Health Unit	Y	Mayor, 6 ward Councillors
Dorion	375	80km (Thunder Bay)	1.8	Thunder Bay District Health Unit	Y	Reeve, 4 Councillors
East Ferris	4,946	15km (North Bay)	32.6	North Bay Parry Sound District Health Unit	N	Mayor, 4 Councillors
Hornepayne	968	393km (Timmins), 414km (Sault Ste. Marie)	4.8	Porcupine Health Unit	Y	Mayor, 4 Councillors
Temiskaming Shores	9,634	154km (North Bay), 125km (Rouyn-Noranda, QC), 209km (Timmins)	54.5	Timiskaming Health Unit	N	Mayor, 6 Councillors
Terrace Bay	1,528	219km (Thunder Bay)	10.1	Thunder Bay District Health Unit	Y	Mayor, 4 Councillors
White River	557	314km (Sault Ste. Marie)	5.8	Algoma Public Health	Y	Mayor, 4 Councillors

WHAT WE LEARNED

Document Review

Our review of council packages from January 2020-June 2022, the first six waves of the COVID-19 pandemic, identified 10 themes:

1. Advocacy. Municipalities engaged with each other, with municipal associations, and with other levels of government to address their local policy needs.

2. Community Needs and Supports. Municipalities received communication about, or discussed, local needs and support in the context of the economic and health implications of the pandemic. This related to Indigenous communities, impacts to organizations and businesses, equity considerations, health impacts, local engagement, and supports for individuals, organizations and businesses.

3. Emergency Management. The topic of emergency management appeared frequently in council packages, specifically emergency planning, links to other emergencies, discussions related to climate change, and pandemic recovery.

4. Funding. This relates to both funding that had become available, and funding being requested by the municipality.

5. Impact on Democracy. This theme relates to shifts in engagement with and access to democratic activities, including virtual meetings, alternative voting, and changes in decision-making processes or consultation requirements related to provincial policy.

6. Impacts to Municipality. This theme reflects impacts from the pandemic on the municipal government or municipal corporation, including capacity challenges, continuity of operations, financial impacts, human resources, impacts to services, projects, plans, and lessons learned.

7. Incoming Information. Municipal agendas and minutes included significant amounts of pandemic-related information from the province, other organizations, social services, and local public health.

8. Pandemic Specific. This theme reflects references to local case counts and public health measures.

9. Provincial Impacts. References to Ontario-wide impacts of the pandemic, generally related to delays or shifts in provincial level policy and projects.

10. Recognition & Thanks. This theme represented sentiments of recognition and gratitude expressed by municipal leaders, and by community members.

Municipal Interviews

The document review informed the interview guide used for municipal elected leaders (7) and staff (6). Analysis of these 13 interviews resulted in 4 broad themes.

1. Local linked to global. Local communities' policies, social, and economic experiences are interconnected with larger systems. Multiple levels of governance (provincial, federal, Indigenous governments) inform policies and programs that manifest locally, as do the outcomes from decisions at these other levels of government. Global economic factors affect local employment patterns, supply chains, and costs of living. Complex information landscapes—information sources, often conflicting, from around the world—complicate understanding local risks, especially in emergencies. Lastly, risks have become more global—e.g., extreme weather related to climate change--making them less predictable and difficult to manage locally.

> Small municipalities often struggle to communicate their needs to higher levels of government. To amplify their message, they sometimes support each other's resolutions. "Those shared support resolutions are important. They're important to mobilize change to ensure that voices are being heard. And then if it's something that is really dynamic and really needs to be pivoted then you all need to support it and move it forward." (Municipal representative)

> Rural municipalities relied on local public health agencies to update and interpret pandemic-related information. "We had regular meetings with (the Medical Officer of Health) as well. She would call on the mayors and CAOs and had regular meetings updates with them. If there was any changes, she would call and make sure that everybody, all the municipalities in the area, were up to date on all the information." (Municipal representative).

2. Impact of rurality. Rurality shaped the experiences of participating communities. Small rural municipal governments, with small tax bases, are hubs of information and services for communities. Their size enabled adaptability to rapid changes but made them vulnerable to illness. Political geography, including proximity to regional service providers, distance from urban centres, transportation infrastructure, access to outdoor spaces during lockdown, all had an impact. Rural social factors, such as sense of cohesion and histories of mutual aid, were beneficial but also led to stigma and division over public health measures. Inadequate broadband and cellular infrastructure posed challenges, while informal communication networks in small towns enabled local information sharing. Rural health systems lack surge capacity, and organizations serving rural communities are challenged to do so equitably. Lastly, rurality shapes emergency management itself with low thresholds for overwhelm and few formal resources in which to engage.

> Many of the pandemic protection measures did not seem relevant to rural communities. "You're not gonna open up a park (if) 200 people are gonna be there. We don't have 200 children in our community, so the park wouldn't be overutilized, people would respect (the need for space). And our community was so in tune to respecting boundaries too." (Municipal representative)

> Rural communities used all-of-society approaches in their pandemic response. "What helped in our response was, which was amazing to see, was everybody working together and everybody contributing, whether they were a small employer, a big employer, a big corporate. I found in a small town, you know everybody, right? And that line from personal to professional sometime disappears and that's a good thing during the emergency cause everybody's willing to help." (Municipal representative)

Limited Internet and cellular service affected governance as well as access to health, education, and social connection during the pandemic. "You're gonna attend our council meetings through zoom as a councillor and there's times where people are getting kicked off, rejoining, kicked off, rejoining. So that affects, one the length and two it affects your ability to make a decision properly if you're missing half the meeting." (Municipal representative).

Rural municipal offices were hubs for pandemic related information and response. "I mean, the municipal government, we don't realize sometimes its importance. But it is the one that is closest to people. And when there are problems, they turn to the municipality more so than they do on a regular basis and I would say that I felt that that was the case during the pandemic." (Municipal representative) "Because in a small town that municipal office is like Google." (Municipal representative)

3. Opportunities to enhance emergency management. Municipalities are required by legislation to focus on emergency preparedness, conduct annual exercises, and operate with limited resources despite growing provincial responsibilities. There is little consensus on definitions or municipal roles within the emergency management cycle. Most responders had little prior experience and had to act under extreme duress, and with considerable impact on their day-to-day lives.

Rural municipalities prioritized public wellbeing. "You gotta take care of your people first, right? Take care of them first and your infrastructure second." (Municipal representative).

The pandemic response diverted resources from other health issues. "Some of the other items were put on the back burner like the opioid use and some of the hunger issues that we have. I really felt they were put on the back burner while we dealt with COVID." (Municipal representative)

Reflection on the utility and relevance of emergency plans led to ideas about improving them, "If we have an emergency plan, make sure it's up to date and make sure that everybody is involved and everybody that needs to be involved. And involve the community. Don't write this policy here, this report and put it on the shelf and then when something happens, you pull the binder off the wall and away you go. I think you need to have a public meeting, talk about it, talk about it before the policy is written because there might be one or two or ten people that might come up with a different idea that we never ever thought of." (Municipal representative)

4. Influence of the individual. Decision-making, whether individual or organizational, depends on one's knowledge, beliefs, and attitudes. In communities where fewer people make decisions and hold multiple roles, individual perspectives have greater impact. Factors such as strong leadership, trust, health literacy, and a focus on collective or individual level interests shaped communities' experiences.

Driven by the individuals involved, municipalities took creative and meaningful actions to share information and support the community. These included social media Q&A sessions with the mayor, livestreaming council meetings, a reeve calling older adults, offering grocery vouchers to older adults, property tax relief, private sector partnerships, continuing community events with protective measures, creating a social media page for residents to support one another, setting up an email/text notification system, and sending regular mailouts.

Actors involved in rural emergency management

In rural Northern Ontario, emergency management involves a range of actors including municipal governments, local service boards, local public health agencies, social services, emergency responders, health care, educational institutions, non-profits, private businesses, the media, and volunteers. Additional support comes from district and regional municipal associations, provincial and federal governments, including Emergency Management Ontario (EMO) and the Ministry of Natural Resources and Forestry (MNRF). Local coordination typically occurs through a Community Emergency Control Group (CECG) led by a municipal emergency coordinator, with collaboration extending to nearby Indigenous governments.

Organizational Interviews

Key informants named various other actors who shaped the local pandemic experience, specifically primary care providers, local public health units, the Canadian Red Cross, municipal associations, and Emergency Management Ontario. The themes above were used to inform interviews with 9 organizations. Analysis of organizational interviews confirmed the themes above and led to the development of four areas of potential action, to help rural communities respond to disruption.

Local public health units supported rural communities in various ways:

- Regular email updates to municipal offices
- Calls with Medical Officer of Health and municipal councillors/staff
- Partnerships with municipalities and healthcare providers for services like testing and vaccine clinics
- Expertise and resources from a central hub
- Regional case reporting to protect rural privacy
- Communications designed to apply to the whole region
- Community-based staff, mobile services, and travelling to provide services

1. Understanding emergency management

Gaps between evidence-based knowledge and its application are common, and this research suggests their presence in Ontario's rural emergency management practice.[68] This research highlights inconsistent conceptualization of emergencies and the primary Canadian framework for discussing them. While emergencies are often seen as short-term, large-scale events, emergency management research is increasingly recognizing their full social implications.[69,70] Northern Ontario's Nishnawbe Aski Nation emphasizes applying emergency management to social emergencies.[71] Similarly, key informants named the drug toxicity crisis, a social issue significantly affecting Northern Ontario, as an emergency.[7]

Inconsistent and inadequate investment in the prevention phase of emergency management perpetuates factors that contribute to or worsen emergencies. Similarly, inadequate investment in and understanding of the potential for mitigation lead to narrow hazard definitions and excluding social vulnerabilities from risk assessments, undermining effective risk reduction.[41] The response phase is prioritized, but perspectives on mitigating social and secondary impacts vary. Lessons from British Columbia show how emergency discourse can overlook the full impacts of disaster.[70] Among key informants, recovery perceptions range from documenting lessons learned to returning to pre-emergency functioning to investing in long-term transformation. Ideally, though, recovery focuses on "building back better" and addressing structural issues contributing to emergencies.[72,73]

2. Helping rural communities thrive

Healthy, resilient, and equitable communities are less vulnerable to disruptions.[74] The COVID-19 pandemic's impact was worsened by rural-specific structural disparities in communications infrastructure, transportation, and health service access.[75] Recognizing these disparities offers an opportunity to address them and minimize future disruption. This begins with financial investment in rural infrastructure, including municipalities, local public health, and rural health care.[75]

Collective investment in preventing and reducing vulnerability to emergencies can avoid future costs. The pandemic strengthened cross-sectoral and cross-disciplinary relationships, which communities can use for upstream, preventative work. In 2022, Ontario mandated the creation of Community Safety and Well-Being (CSWB) plans for all municipalities. Aligning CSWB plans with locally identified hazards could help enhance prevention and mitigation, though the lack of accompanying funding challenges their implementation in rural communities.

Asset-based community development approaches can mobilize latent energy to strengthen relationships, solve problems creatively, and foster wellbeing.[76,77] Recognizing the influence of higher levels of government on local life can motivate rural community actors to engage in national and provincial politics, and influence social, commercial, and ecological determinants of health. Enhanced collective engagement can also reduce the need for top-down measures during crises.[78]

Governance practices affect Indigenous health both by upholding colonial policies and by making decisions affecting land access.[79-81] However, despite the research being conducted on treaty territories and the institutional recognition of treaties, discussions on supporting Indigenous populations off reserve, decolonizing the institutions involved, ensuring culturally appropriate approaches for urban Indigenous populations, and addressing treaty implications for the land of participating municipalities, were limited. Also absent from the discourse among key informants is the emphasis on ecosystem health, an increasingly acknowledged part of community resilience.[82]

Local public health agencies in Northern Ontario have a unique role according to the Ontario Public Health Standards[83] to reduce health inequities, promote health and well-being, and mitigate the impact of emergencies. If sufficiently resourced to engage in health promotion work, they are well positioned to facilitate the process of helping rural communities thrive, and to link preventative work to community hazards.

Needs vs Assets

This research advocates for increased institutional investment and asset-based collaboration, a discussion that wades into the waters of political ideology related to the size of government and taxation. In Ontario, only 2.5% of health spending goes to public health; more investment here could reduce overall health care needs.[84] Municipalities have faced significant provincial downloading since the 1990s without matching access to provincial income.[85,86]

At the same time, institutions can avoid displacing the community's capacity to solve their own problems.[87] When institutions assume full responsibility for community issues, discussions focus on service needs and funding. Alternatively, institutions can assume a supplementary role and support community assets. This approach requires fewer resources and enhances wellbeing by fostering social capital, individual sense of purpose, and locally tailored results.[87]

3. Encouraging full participation in emergency management

While a system of actors take part in rural emergency management, their participation tends to be focused in preparedness and response. Increased participation in prevention was explored above, in *Helping Rural Communities Thrive*.

Reflection on actors' experiences reveals opportunities for future learning. Public health actors in Ontario encounter varied perceptions of their role, including within the provincial government. Public health organizations differed in their emergency response priorities, public communication, and use of human resources. The Canadian Red Cross enhanced local responses through cost-recovery contracts, supporting isolation interventions, vaccination clinics, and managing compounded emergencies like evacuation during spring flooding. Both organizations faced human resource challenges—Red Cross with volunteer needs, and public health units with workforce burnout—but with attention and investment, both can improve local emergency management.

Including civil society in all phases of the emergency management cycle can enhance rural communities' capacity. Community involvement in hazard identification and mitigation uses local knowledge and strengthens social networks.[88,89] In a response effort, trained and supported community members can activate mutual aid, provide first aid, and help with grassroots communications. During COVID-19, the private sector bolstered rural community wellbeing by helping communications, supporting public health measures, providing essential supplies like masks and hand sanitizer, and supplementing public sector resources, such as municipal public works functions.

4. Addressing mismatch of emergency management tools

Emergency response structures and tools, like preparedness plans, business continuity plans, risk communication plans, the Incident Management System (IMS), and the Incident Action Plan (IAP), each had some level of incompatibility with the extended and complex nature of the COVID-19 pandemic. Adaptations were necessary to address the prolonged emergency, evolving roles, health equity considerations, and co-occurring public health issues. Human resources were affected, risk communication plans had to be rapidly and repeatedly revised, and new resources like telephone and email lists had to be created.

Mismatches of tools may stem from gaps in linking knowledge to action, due to a lack of formal emergency management education and low local investment. Tools that broaden participation, enhance hazard and risk identification, support adaptation alongside mitigation, integrate health equity, and uphold democracy and pluralism would improve local implementation of current research. For example, Ontario's public health sector developed a framework and indicators for emergency preparedness and response which has since been complemented by equity indicators.[91-93]

RECOMMENDATIONS

The areas for action discussed above were presented at a May 2024 workshop in Sudbury, Ontario with 13 people from participating communities and organizations. Each potential action was presented as a question (i.e., "how can we…"?) to which workshop participants developed preliminary recommendations through rounds of one-on-one, small group, and full group discussion, a method called Structured Interview Matrix (Appendix A). These preliminary recommendations were then supplemented with recommendations from interviews and the literature review.

The following are recommended to strengthen rural communities' ability to respond to future disruption:

1. Clarify Emergency Management Framework

- **Review and standardize documents:** Review and standardize emergency management documents to ensure clear definitions and consistency for each phase.
- **Integrate social emergencies:** Include social emergencies in the existing emergency management framework.
- **Define roles clearly:** Clearly outline the roles and responsibilities of everyone involved, including local public health agencies, municipal governments, and non-profit organizations.

2. Increase System Capacity for Emergency Management

- **Continuous training:** Regularly update and deliver training on the entire emergency management cycle, focusing on decision-making, risk communication, healthy public policy, and health inequities. Improve health and social media literacy.
- **Centralized support for rural communities:** Provide centralized resources, expertise, and a deployable team to assist rural communities during crises. Strengthen policy support for municipalities.
- **Reform funding:** Redesign funding models to encourage collaboration, reduce barriers for small communities, recognize higher costs in rural areas, and allow flexible access to loans. Ensure ongoing funding for rural emergency management, including dedicated roles, infrastructure, and investments across all emergency management phases.
- **Whole-of-society approach:** Engage civil society as active participants in emergency management.
- **Strategic communications:** Standardize communication tools and language, build trust in spokespeople, use diverse channels, and ensure consistent messaging. Provide accurate, locally relevant emergency information to the public.
- **Legislative support:** Strengthen local public health initiatives, expand the Emergency Management and Civil Protection Act to incorporate additional partners and phases, and ensure compliance with the Ontario building code regarding fire and safety standards.

3. Enhance Understanding of Rural Emergency Management

- **Specialized training for rural contexts:** Develop training programs that address the unique challenges of rural emergency management. Ensure that regional and provincial actors understand these specific issues.
- **Promote regional collaboration:** Create a regional emergency management community of practice to share skills, experience, and knowledge. Conduct joint exercises and use shared Community Emergency Management Coordinators, taking a multi-community approach.
- **Strengthen networking and communication:** Foster regular networking and information exchange among organizations to build relationships, understand rural needs and strengths, and improve emergency management effectiveness.

4. Modernize Emergency Management Strategies

- **Integrate asset-based approaches:** Use asset-based and strengths-based methods throughout the emergency management cycle.
- **Include an Indigenous lens:** Support local Indigenous organizations, consider the impact of hazards and emergencies on Indigenous people and on the land.
- **Prevention:** Invest in factors that reduce vulnerability, such as transportation, housing, healthcare, and Internet access. Promote healthy environments and support local efforts on issues like climate change. Encourage communities to identify risks and prioritize prevention in Community Safety and Well-Being plans.
- **Mitigation:** Include social risks and vulnerabilities in risk assessments, considering impacts on individuals, communities, societies, and ecosystems. Ensure mitigation efforts address these risks at all levels.
- **Preparedness:** Plan for community-specific needs during emergencies, like transportation and healthcare, and anticipate supply chain challenges. Engage vulnerable populations in planning and share plans with the community. Regularly conduct exercises with diverse partners, focusing on complex scenarios, and practice using response tools like the Incident Management System.
- **Response:** Adapt regional or provincial strategies to rural community characteristics. Update tools to: address complex emergencies, facilitate diverse perspectives, identify and mitigate short- and long-term consequences of response measures, support learning and reflection, adapt to varying levels of participation and knowledge among participants, and address power dynamics and equity issues.
- **Recovery:** Require debriefing sessions and thorough documentation of lessons learned. Conduct collective debriefs across organizations or regions to promote shared learning and improvement.

Implications for rural Canada

While these findings may not apply universally to all rural communities in Canada, they align with existing literature on health governance and emergency management. They may be relevant to other rural areas with similar governance structures or comparable geographic and social factors such as population size or distance from an urban environment.

These findings underscore challenges common to many rural communities in Canada, including those faced by small local governments, unequal investment in emergency preparedness, proximity to natural environments, and colonial histories. While rural needs in remote Northern regions may vary from those near more populous areas, developing policy that addresses diverse access to health and social services, low population density, unique leadership dynamics, communications infrastructure limitations, and physical resource availability will help many rural residents.

Beyond the local level, policymakers shaping rural life tend to be in urban areas. Rural communities will benefit from increased understanding among urban decision-makers of the realities of rural life and emergency management in this context. There are many calls to rural-proof Canadian policy. For example, the Canadian Rural Revitalization Fund, Canada 2020, and the Organization for Economic Cooperation and Development (OECD) advocate, respectively, for applying a rural lens to policy and development, bolstering rural resilience and promoting regional collaboration; enhancing local governance capacity and decision-making influence to rural areas; and shifting rural policy from economic development to local, asset-based approaches centred on environmental and social dimensions of wellbeing.[16,17,20]

Limitations

In Northern Ontario, there are 140 municipalities with populations under 10,000 that exhibit diverse geographic, social, and economic characteristics, and the seven municipalities studied may not be fully representative. While the study aimed to include municipalities from each of the seven Northern health unit areas, the inclusion of only five may not capture regional variations, such as those in Northwestern Ontario with its higher Indigenous population and more remote areas. Additionally, by not seeking the perspectives of civil society or the private sector, this research may be missing perspectives that would add complexity and nuance to the findings. Finally, the main author's positionality as a public health practitioner may have influenced participants' willingness to express critical views about public health.

Opportunities for future research

This project highlights the need to expand emergency response tools. Future research could systematically explore global models and seek alternatives or adaptations to Ontario's dominant Incident Management System. Intervention research can integrate recommendations from this report on prevention, risk mitigation, and communications, particularly in rural areas. Further studies could also investigate rural service delivery methods tailored to specific geographies and population densities.

CONCLUSION

This research aimed to understand how rural communities in Northern Ontario can mitigate future disruption. By reviewing municipal meeting records and conducting interviews with municipal staff, elected leaders, and local public health and other organizational representatives, the study uncovered their experiences and found opportunities for future investment.

Findings show the unique rural experience, influences from local to global levels, the complex information landscape affecting emergency management, and opportunities to improve emergency management itself. From these, a number of opportunities for action were identified. The first is to invest in clarifying understanding of emergency management. This acknowledges the evolution that the field has taken, the ongoing development of new research literature that often takes time to make it to practice, and some examples of policy incoherence. A second area for investment is in community and institutional conditions that make communities strong and connected, such as broadband internet, equitable access to health services, and community engagement. Third, broadening participation in the phases of emergency management to remedy the existing bias to preparedness and response, with increased investment in prevention, mitigation, and recovery, and among a broader and more collaborative group of actors. This can include members of the public and Indigenous community members, who know best what their communities need. Lastly, given increased recognition of the complexity and social components of emergencies, reimagining the tools used to support emergency management can help ideas translate into tangible change. Recommendations have been provided to facilitate these findings into practice.

We were not prepared for the COVID-19 pandemic. Faced with added and compounding emergencies, now is the time to prevent and mitigate all that we can, adapt where needed, creatively engage our broader systems to create a whole-of-society culture of response, and become bolder in the challenges we give ourselves in recovery.

Multiple levels of government, the public health sector, and communities have a role in addressing these findings. Rural communities can collaborate regionally and advocate for change through municipal associations.

The COVID-19 pandemic was an unprecedented tragedy for many people across the world. Acknowledging the inevitability of future pandemics and other types of disruption, these findings contribute to the recovery phase of this global event to help us reflect, learn, and invest in helping a large part of Canada reduce the impact of future disruption.

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APPENDIX A

METHODOLOGICAL APPROACH

This project has been reviewed by the University of Guelph Research Ethics board for compliance with federal guidelines for research involving human participants (REB #22-10-010).

Three phases of data collection occurred from February 2023-May 2024. An Advisory Committee consisting of members of the research team and key stakeholder groups provided guidance and local perspectives throughout the research process.

Recruitment took place from January-March 2023. Municipalities with populations <10,000 across Northern Ontario, Canada were invited to take part in the study. An attempt was made to include up to two municipalities from each of the seven Northern Ontario public health regions (Northwestern, Thunder Bay, Algoma, Porcupine, Timiskaming, North Bay Parry Sound, and Sudbury). In total seven municipalities, representing five of the seven regions, took part.

The goal of phase 1 (March-May 2023) was to identify municipal decisions related to the COVID-19 pandemic . It involved content analysis, using NVivo 14, of 6 participating municipalities' council packages from January 2020-June 2022 for content related to the COVID-19 pandemic, and identified 10 themes.

Phase 2 (June 2023-April 2024) aimed to explore successes and challenges experienced by small and rural communities in responding to the COVID-19 pandemic. This phase included development of a municipal interview guide informed by findings from Phase 1 and advisory committee review. Semi-structured interviews were carried out with 7 elected representatives and 6 municipal staff and analyzed using reflexive thematic analysis,92 with a combination of manual and digital approaches, using NVivo 14. Municipal interviews led to the identification of 4 themes which, again with advisory committee input, informed the organizational interview guide and list of organizations to invite for interview. Semi-structured interviews were carried out with 11 representatives from 9 organizations and again data were analyzed using reflexive thematic analysis, using NVivo 14. Phase 2 led to 4 areas of focus to be addressed during phase 3.

The goal of phase 3 was to identify support and structures that will help small and rural communities more effectively respond to disruption; this took place from April-July 2024. This involved use of the Structured Interview Matrix (SIM) process93 to explore specific ways to address the 4 areas of focus identified in interviews, again informed by advice by the project advisory committee. Thirteen participants attended an in-person Structured Interview Matrix (SIM) participatory workshop in Sudbury, Ontario on May 6, 2024. Through 3 rounds of discussion and deliberation, the group provided recommendations for addressing 4 areas of focus. Results from the SIM workshop were reviewed alongside recordings and added meeting notes made by workshop participants. These were complemented by interview data and the literature review to develop a robust set of research recommendations and reviewed by the project advisory committee, then further organized and condensed using NVivo 14 to 4 recommendations with 18 sub-recommendations presented above.

Phase 4's intent was to compile and share the research findings to inform policy and practice. Research findings have been shared throughout the duration of the project at conferences and online learning events, and will continue until the end of 2024 with this report, a policy brief, and several articles to be developed for publication.