ORIGINAL ARTICLE

Lessons learned from the COVID-19 pandemic: The importance of physician leadership in responding to rural community ecosystem disruptions

Alexandra Bland, MSc, Anna de Waal, MSc, Stefan Grzybowski, MD

Department of Family Medicine, Centre for Rural Health Research, University of British Columbia, Vancouver, BC, Canada

Correspondence to: Alexandra Bland, alexandra.bland@ubc.ca

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Abstract

Introduction: The COVID-19 pandemic presented an unprecedented challenge for rural family physicians. The lessons learned over the course of 2 years have potential to help guide responses to future ecosystem disruption. This qualitative study aims to explore the leadership experiences of rural Canadian family physicians during the COVID-19 pandemic as both local care providers and community health leaders and to identify potential supports and barriers to physician leadership.

Methods: Semi-structured, virtual, qualitative interviews were completed with participants from rural communities in Canada from December 2021 to February 2022 inclusive. Participant recruitment involved identifying seed contacts and conducting snowball sampling. Participants were asked about their experiences during the COVID-19 pandemic, including the role of physician leadership in building community resilience. Data collection was completed on theoretical saturation. Data were thematically analysed using NVivo 12.

Results: Sixty-four participants took part from 22 rural communities in 4 provinces. Four key factors were identified that supported physician leadership towards rural resilience during ecosystem disruption: (1) continuity of care, (2) team-based care models, (3) physician well-being and (4) openness to innovative care models.

Conclusion: Healthcare policy and practice transformation should prioritise developing opportunities to strengthen physician leadership, particularly in rural areas that will be adversely affected by ecosystem disruption.

Keywords: Change, leadership, physician, rural

Résumé

Introduction: La pandémie de COVID-19 a représenté un défi sans précédent pour les médecins de famille en milieu rural. Les leçons tirées au cours des deux

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années écoulées peuvent aider à orienter les réponses aux futures perturbations de l'écosystème. Cette étude qualitative vise à explorer les expériences de leadership des médecins de famille ruraux canadiens pendant la pandémie de COVID-19, en tant que prestataires de soins locaux et chefs de file de la santé communautaire, et à identifier les soutiens et les obstacles potentiels au leadership des médecins.

Méthodes: Des entretiens qualitatifs virtuels semi-structurés ont été réalisés avec des participants issus de communautés rurales du Canada entre décembre 2021 et février 2022 inclus. Le recrutement des participants a consisté à identifier des contacts de base et à procéder à un échantillonnage boule de neige. Les participants ont été interrogés sur leurs expériences durant la pandémie de COVID-19, notamment sur le rôle du leadership des médecins dans le renforcement de la résilience des communautés. La collecte des données s'est achevée après saturation théorique. Les données ont été analysées thématiquement à l'aide de NVivo 12.

Résultats: Soixante-quatre participants provenant de 22 communautés rurales de quatre provinces ont pris part à l'étude. Quatre facteurs clés ont été identifiés pour soutenir le leadership des médecins en faveur de la résilience rurale en cas de perturbation de l'écosystème: (1) la continuité des soins, (2) les modèles de soins en équipe, (3) le bien-être des médecins et (4) l'ouverture à des modèles de soins novateurs.

Conclusion: La politique de santé et la transformation des pratiques devraient donner la priorité au développement d'opportunités pour renforcer le leadership des médecins, en particulier dans les zones rurales qui seront négativement affectées par la perturbation de l'écosystème.

Mots-clés: Changement, leadership, médecin, ruracl

INTRODUCTION

The COVID-19 pandemic has had an unprecedented impact on health service delivery around the globe. In Canada, rural communities are supported by small and often vulnerable health systems that have had to adapt and innovate to support their populations in the face of disruption. These approaches have been met with variable success throughout the pandemic. More importantly, the pandemic is only one of a range of potential ecosystem disruptions that challenge rural community sustainability and resilience, including related disasters such as wildfires, floods and heat domes.[1,2] Rural physicians can have an important leadership role in communities and may be well-positioned to support community resilience in the face of these challenges.[3]

Existing literature examining physician leadership during natural disasters and emergencies is limited, particularly in the context of rural Canadian practice. National physician organisations such as the Canadian Association of Physicians for the Environment and the Society of Rural Physicians of Canada (SRPC) have published resources, reports and guidelines on the need for physician engagement in change advocacy[4-6] but research exploring real-world physician leadership in these contexts is scant. As emergencies increase in frequency and severity, the accompanying health effects will create conditions in which physicians and medical professionals bear a greater burden of responsibility to advocate for and support patient health.[7] Rural communities will disproportionately face significant challenges caused by the changing environment and ecosystem conditions compared to urban centres, particularly those dependent on resource-based economies that may be vulnerable.[8] With rural healthcare reaching points of crisis across much of Canada, it is vital that strategies to support rural community resilience to further health and threats are implemented.

The Climate Change and Ecosystem Disruption Adaptation Responses in Rural Canada (CCEDARR) study was funded through the Co-RIG Phase II competitive grant by the Foundation for Advancing Family Medicine and the Canadian Medical Association. CCEDARR was designed to explore the ways in which rural physicians have participated in and contributed to rural community sustainability during the pandemic and the implications for responding to future ecosystem disruptions.

The purpose of this research is to gain a more comprehensive understanding of the role of rural physician leadership in responding to the threats of the COVID-19 pandemic and ways in which this leadership can be leveraged to build the resilience of rural communities in Canada.

METHODS

A qualitative exploratory approach was undertaken to engage rural physicians and community members in semi-structured virtual interviews on their perspective of resilience during the COVID-19 pandemic. Participants were initially identified via seed contacts, also referred to as initial contacts,[9,10] from the SRPC and CCEDARR study co-investigators, and then recruited through a snowball sampling strategy, a commonly employed method in qualitative research.[11,12]

Semi-structured qualitative interviews 30–80 min in duration were offered through Zoom™ or phone to participants between December 2021 and February 2022 inclusive. The interview guide included questions about experiences providing care during the COVID-19 pandemic, perceptions of community resilience and tools and tactics to support resilience during ecosystem disruption. For the purposes of this paper, community resilience is defined as the 'combination of resistance to frequent and severe disturbances, capacity for recovery and self-organisation and the ability to adapt to new conditions'.[13] Leadership is defined in the context of family physician practice per the CanMEDS-Family Medicine framework as, '(…) actively contribut (ing) to implementing and maintaining a high-quality health care system, and take responsibility for delivering excellent patient care through their activities as clinicians, administrators, scholars and/or teachers'.[14]

Interviews were audio recorded with participants' written informed consent and recordings were securely transcribed by Scriptastic Transcription Services. The interviews were conducted by the CCEDARR principal investigator, research coordinator, and research assistant. Semi-structured interview questions underwent an iterative process, guided by emerging themes. Recruitment continued until sufficient data were collected to allow for rigorous interpretation, which was determined through research team consultation. Virtual community forums were completed to show study results to participants and seek community feedback on the interim thematic analysis.

Interview data were thematically analysed in NVivo 12 using Braun and Clarke's approach to inductive coding.[15] Two researchers reviewed the transcripts to become familiar with the data and annotated initial codes relevant to the research questions. Interviews were uploaded to NVivo 12 and coded by a team of 7 rural health researchers. A codebook was created by the research team and each reference was coded under a relevant node by sentiment, 'positive', 'negative', and 'neutral.' A coding protocol guided the research team to ensure consistent thematic definitions and coding consistency. At least 2 research team members independently coded each interview transcript and intercoder reliability was established through running coding consistency queries. References that were double-coded were compared for congruence to ensure consistent data interpretation.

RESULTS

Sixty-five participants were recruited from 22 rural communities across 4 Canadian provinces [Table 1].

Rural physician leadership was an important component of the perceived resilience of rural communities to the COVID-19 pandemic in some, but not all, communities. The contribution that rural physicians made depended on several system-level attributes that were captured in our qualitative work. These included the longitudinal relationships the physicians had with their communities, the model of care provided, the resilience of the health system they practised under, and the physicians' emphasis on social accountability. Almost all participants highlighted relationships as the most protective factor for community resilience during the COVID-19 pandemic. Physician and healthcare provider participants relied on strong relationships with

Table 1: Distribution of participant characteristics

Participants	Frequency (*n*=65), *n* (%)
Role	
Rural physician	27 (41.5)
Healthcare team member	8 (12.3)
Mayor or town councilor	8 (12.3)
Community member	22 (33.8)
Province	
Alberta	11 (16.9)
British Columbia	33 (50.8)
Ontario	18 (27.7)
Saskatchewan	3 (4.6)

colleagues to support their individual resilience, emphasised provider-patient relationships as a tool to enhance trust in medical leadership, and leveraged several avenues of communication to encourage community collaboration.

System-level supports for physician leadership

Continuity of care

Participants underscored the impact of longitudinal relationships on trust building between care providers and patients, particularly during times of health crises including the COVID-19 pandemic. A community member shared that a long-time physician was 'kind of a local hero' and a 'deeply, deeply appreciated man in town' (Community member, AB). One physician noted that many of their patients have known them 'since we were children' and that they have 'grown up together for years' having 'delivered their children and palliated their grandparents' (Physician, ON). This continuity of care was cited as a protective factor in the physician's perception of trust in their medical leadership and expertise. Communities that had continuity of care through 'trusted long-term family physicians' (Physician, BC) were frequently better suited to navigate the evolving pandemic, playing a role, particularly in addressing vaccine hesitancy and compliance with public health measures. As one community member put it,

> *The local healthcare workers (…) have done just an absolutely wonderful job on providing information and ensuring that people who are making a choice to get vaccinated have the best information available and can make an informed decision* (Community member, BC).

Conversely, not having a consistent physician and relying on locum care provision was described as 'affecting the level of trust' (Physician, ON) between care provider and patient during the pandemic. Physician participants who were less established within their communities, or provided locum coverage to remote locations, more frequently expressed that their leadership was less influential on patient outcomes and community-level resilience during the pandemic.

The challenges of recruitment and retention of physicians to rural practice as determining factors of capacity to create longitudinal relationships and tackle the challenge of lack of access to primary care were highlighted in almost every interview. Communities that had some existing capacity and infrastructure to support incoming physicians may have been more attractive for recent graduates of medical programs:

> *They're not coming to a place that needs three physicians they [won't] be run off their feet the minute they walk into town and I think that that's had some appeal for the cohort of new grads that we've been able to recruit over time* (…) *People aren't burnt out, they can be supported* (Physician, ON).

By leveraging a provincial recruiting grant, one community attracted a full complement of physicians, citing the 'work-life balance' and 'desire to be a part of a family health team structure' (Healthcare team member, ON) that provide mentorship and learning opportunities as two major recruiting factors. Participants shared that these strategies for recruitment, which were established before the pandemic, contributed to their community's capacity to respond effectively and provide quality 'relationship-based care' (Physician, ON) during the pandemic.

Team-based care models

Supportive professional environments for healthcare provision demonstrated success in building collective resilience. Primary care networks and family health team structures increased capacity to support both physicians and patients through prolonged and strenuous health crises. These models of team-based care delivery were primarily facilitated through alternative-payment plan (APP) models that support allied health professionals to work alongside physicians in a greater capacity without the direct overhead requirements of private practice clinics. The desire to build a system of 'full team-based care culture' (Physician, BC) was reiterated by strategies enacted by care teams that integrated community social services, education professionals, youth networks, and local businesses during the pandemic to support community well-being. One physician addressed the strengths of this collaborative healthcare team structure,

> *It very much helps when you're not expected to work in a silo kind of environment. We have this broad responsibility when the people you're shoulder to*

shoulder with recognize the importance of that responsibility and support you to do it (Physician, ON).

Several participants addressed the need for a non-hierarchical approach to leadership, with the voices of physicians, the healthcare team, and community shaping care delivery,

It's a very intentional physician community that we wanted to create, and we base ourselves around a consensus model, so that everyone's word is valued, no matter if you've been here for 20 years or you just started (Physician, ON).

Participants indicated that while physicians played an important leadership role during the COVID-19 pandemic response activities, the co-creation of strategies with the healthcare team, and with input from patients and families more broadly, was central to fostering a culture of team-based care. Effectively understanding and responding to the needs of the community required a 'physician perspective articulated around a patient-centric and family-centric model' (Physician, BC).

Physician well-being

Many physicians spoke of the toll that the COVID-19 pandemic had taken on their wellbeing as well as tactics that they implemented to reduce burnout and support personal resilience. One physician noted the 'COVID fatigue' that 'takes up bandwidth' (Physician, ON) and limits their capacity to care for their patients. Another commented on the effect that COVID-19 has had on community wellbeing,

This pandemic has burned, not just doctors out, but everybody out, we're tired, we don't want to do this anymore. You don't want to treat each other like this or be treated like this anymore (Physician, AB).

Other participants, namely those who worked in team-based care environments, described the importance of an 'effective team' with 'built-in capacity' to support physicians and allied healthcare professionals to explore interests outside of clinical practice as a tool to keep the team 'resilient both as individuals and as a clinical group' (Physician, ON). This theme of building an effective team to support physician well-being was echoed by another participant,

We were resilient because we could recognize and allow for people to take a break when they were burnt out (…) We feel comfortable and we feel safe with each other that we can actually admit that we need time, or we're feeling kind of overwhelmed (Physician, ON).

Openness to innovation in care models

Communication and virtual care

Clear, concise messaging from physicians during the pandemic was highlighted by nearly all participants as vital in supporting resilience and an effective community-level response. Clinic staff often leveraged existing social media platforms to share updates on public health directives and COVID-19 cases. The ease with which messaging can be shared amongst the community has made social media 'one of the most useful tools' (community member, BC) during the pandemic. One physician, in reference to the physician-patient relationship, shared how the shift to social media communication from 'more traditional means of communication (...) will change irreversibly' (Physician, ON).

Participants also described the value of virtual care in providing timely health services to their rural patients. It allowed care providers to 'continue to function [and] run the clinic for inpatient care despite the pandemic' and to deliver routine services such as prescription refills and referrals in a 'safe or relatively safe environment' (Physician, SK).

Many physicians implemented procedures to call their more vulnerable or isolated patients on a daily or weekly basis during lockdowns to ensure that they had access to care services and social supports. Similarly, phone consultations with physicians and clinic staff at different stages of the vaccine rollouts assisted patients in booking their vaccination appointments and created a space for open dialogue on vaccine hesitancy.

While many healthcare provider participants supported the transition to virtual care, others were hesitant to recommend this mode of service delivery due to concerns that an over-reliance on this system would deteriorate patient–provider relationships,

I think virtual care only does certain things. I think the personal relationship between people and their physicians is important (Community member, BC).

However, the inclusion of virtual care as a tool of an adaptable and versatile primary care system at a local level is something that many providers hope to see continued post-pandemic,

> *I'm really hoping they allow us to continue to including virtual work in the way we operate (…) that's uncertain but, I think it should be structural and we'd like to see that way* (Physician, ON).

Opportunities for leadership

Rural generalists faced unique leadership challenges during the COVID-19 pandemic and coordinating an effective community response was supported by a willingness to go beyond traditional clinical duties. One participant commented, 'I think rural medicine is always unique in that the physician certainly is not limited to solely in-office patient care, we really do wear a million hats' (Physician, ON). They reflected that the pandemic expanded their knowledge and experience in public health, social media management and marketing to encourage engagement with public health messaging from the clinic. Several physicians commented on taking on a greater community education and advocacy role when the first COVID-19 vaccines became available to encourage uptake in their communities:

> *The frequency of meetings really needed to go up.(…) It was helpful for staff to feel like there was a foundation of decision-making, that it wasn't all on their shoulders to try to ad-lib what to say on the phone when patients were asking difficult things of them* (Physician, ON).

Notably, APP physicians interviewed more frequently felt as though it was a remuneration structure that was conducive to non-clinical work and increased their flexibility to participate in community engagement. 'APP definitely does give that luxury (…) because you're not losing any income' (Physician, ON).

Many physicians assumed leadership roles in organising clinic and community responses to the COVID-19 pandemic. The pressures on rural health service provision required physicians and health clinics to be responsive and adaptive in novel ways. One community set up a field hospital in a local school in case the hospital became overwhelmed with COVID patients 'given the distances and the kind of population that we could be facing if an outbreak was in the summer versus winter' (Physician, ON). Another community held weekly radio segments 'where (a) healthcare provider goes on-air and talks about health and promotion-related topics' (Community member, ON) which was able to be repurposed to provide locally relevant COVID-19 information. In the initial stages of the pandemic, rural communities were contending with both a limited understanding of the necessary measures to protect themselves as well as a lack of access to key medical provisions and services. Several participants pointed to the need for collaborative approaches to learn from past experiences in pandemics and ecosystem disruptors. One participant reflected,

> *We've had 3 SARS viruses in 20 years, there's going to be a fourth, there's going to be a fifth. And we're going to have to learn how to use the information that we have at hand to make better choices about how we respond to public health crises* (Physician, AB).

Community members and municipal leadership from communities who deemed themselves resilient during the pandemic shared that physicians were strong leaders when it came to planning and preparedness, which ultimately increased their level of trust. A community member noted that 'the doctors (…) throughout the pandemic have been invaluable' (Community Member, BC).

However, there remains a gap in rural physician leadership and involvement in climate change advocacy and future ecosystem disruption preparedness. One physician stated that 'when we come to things such as climate change… we don't have the rulebook' (Physician, SK) while discussing the availability of climate change continuing education for rural doctors. This sentiment was echoed by a number of physicians we spoke with about training for climate engagement and advocacy. The misalignment between physician education on tools of advocacy, including tactics to discuss the impacts of the changing climate on patient's health, and the training they receive through medical school or continuing education was clear. When asked about their involvement in climate action, a majority of the physicians interviewed reported not actively participating or being marginally involved through 'medical waste reduction programs and (…) implement (ing) recycling programs' (Physician, ON).

DISCUSSION

Physician leadership in rural communities can have a significant impact on the resilience of the community against threats such as the COVID-19 pandemic. The ability of rural physicians to contribute to sustaining community health and mitigating challenges to community stability go beyond providing competent care and include planning, innovating, and adapting health services and community strategies as needed.[14] These actions are facilitated by mutually respectful long-standing relationships between physicians and the community they serve, a healthcare system that supports team based models, including physician involvement in activities beyond direct clinical care, and health system acceptance and support for innovation and adaptation in the face of new and evolving challenges.

The results of this study align with the described roles of medical expert, leader, communicator, health advocate, and collaborator as outlined in the CanMEDS competencies framework.[16] Similarly, the data are consistent with the core principles of family medicine, specifically the longitudinal relationships between physicians and their patients, and physicians acting as a resource to their community.[17,18]

As community-based practitioners, family physicians are uniquely positioned to provide guidance for many community-specific needs. This exploratory work has captured a plurality of perspectives on the experience of rural communities during the COVID-19 pandemic. We found that physician leadership was vital in liaising with health authorities, accessing key medical resources, and providing timely and accurate public health messaging during the pandemic. Participants who saw their communities as resilient were more often those who referred to their physicians as competent and trustworthy leaders.

To deliver services closer to home for rural patients, physicians often embrace a generalist approach that involves a greater scope of practice than may be typically employed by urban care providers.[19] In addition to clinical duties, physicians shared that there was a greater expectation that they would liaise with municipal bodies and provide community-wide public health resources and recommendations during the pandemic. These increased expectations were met by many physicians in communities we spoke with and were supported by resilient health structures, strong longitudinal relationships, and dedication to social accountability.

Existing care models, including financial and human resources, influence the degree to which physicians can participate in leadership opportunities and pandemic response. Physicians that we spoke with who are remunerated on an APP model felt as though they had capacity to participate in duties external to direct clinical care such as meetings with municipal leadership and engagement with public health advocacy. Existing studies support the importance of adequate compensation for physician leadership duties, particularly for those working under fee-for-service models.[20] Further exploration into this finding is presented in an accompanying publication.

While existing studies address the importance of physician leadership in developing effective health systems,[20-25] there is a gap in literature exploring the role of physician leadership in ecosystem disruption preparedness, particularly in rural settings. The COVID-19 pandemic compelled physicians and healthcare professionals into positions of leadership that often required decision-making based on limited information and creative innovation to support community wellness. Physicians we spoke with often felt unprepared and under-educated to provide health leadership in times of climate crises. This hesitancy to participate in climate action at a local level is juxtaposed with the increased national and global focus on health professionals as resources for health-related climate advocacy. This finding is supported by existing scholarship exploring the inclusion of climate change in medical curricula.[26] Further research into the role physicians play in ecosystem disruption preparedness is required, particularly as the frequency and intensity of climate threats increases.

Policy and practice recommendations [Table 2]

Table 2 outlines policy and practice recommendations for supporting physician leadership and climate advocacy. These recommendations have been generated through the exploratory thematic analysis of participant

Table 2: Policy and practice recommendations		
Theme	Sub-theme	Recommendation
System-level supports for physician leadership	Continuity of care	Develop and implement rural health service models that support continuity of care and flexibility for providers to engage in community sustainability activities
	Team-based care models	Support team-based models of healthcare provision to optimise a potential scope of practice to meet the needs of the community
	Physician well-being	Consider advantages of APP models that support broad social accountability in rural settings
Openness to innovative care models	Communication and virtual care	Explore coordinated and independent channels of physician communication to the community
		Implement blended models of virtual and in-person care provided by local practitioners
	Opportunities for physician leadership	Implement more extensive climate change curriculum in medical school and encourage further education for practising physicians
		Create resources for physicians to engage in discussions with patients, and their wider community, about the health effects of climate change
		Strengthen physician advocacy for climate change adaptation in rural communities and encourage physician participation in climate adaptation planning at the local and regional level

APP: Alternative-payment plan

experience and gaps identified in current physician leadership frameworks.

Limitations

This exploratory study was hypothesis-gathering rather than hypothesis-testing and consequently, the qualitative data require further research to test results and generalisability. Due to challenges in participant recruitment, only *4* Canadian provinces were represented in the data. The locations included in this study vary in terms of the number of COVID-19 cases, COVID-19 related deaths, pandemic impacts on service delivery and access, COVID-19 response, degree of rurality and provincial or regional health structure. However, these data also provide real-world insight into various care settings across multiple provinces.

CONCLUSION

The results of this work suggest that physicians who were engaged in contributing to community resilience, trusted by their patients, supported in a team-based care environment, and open to innovative care models were those who were deemed successful leaders by their communities during the COVID-19 pandemic. Rural physicians should be encouraged and supported to take on leadership roles during health-related crises, particularly as the pervasive effects of climate change and ecosystem disruption intensify.

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