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Services de santé, gestion et recherche de politique

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Data Matters • Discussion and Debate • Research Papers

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Healthcare Policy/Politiques de Santé seeks to bridge the worlds of research and decision making by presenting research, analysis and information that speak to both audiences. Accordingly, our manuscript review and editorial processes include researchers and decision makers.

We publish original scholarly and research papers that support health policy development and decision making in spheres ranging from governance, organization and service delivery to financing, funding and resource allocation. The journal welcomes submissions from researchers across a broad spectrum of disciplines in health sciences, social sciences, management and the humanities and from interdisciplinary research teams. We encourage submissions from decision makers or researcher–decision maker collaborations that address knowledge application and exchange.

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Politiques de Santé/Healthcare Policy cherche à rapprocher le monde de la recherche et celui des décideurs en présentant des travaux de recherche, des analyses et des renseignements qui s'adressent aux deux auditoires. Ainsi donc, nos processus rédactionnel et d'examen des manuscrits font intervenir à la fois des chercheurs et des décideurs.

Nous publions des articles savants et des rapports de recherche qui appuient l'élaboration de politiques et le processus décisionnel dans le domaine de la santé et qui abordent des aspects aussi variés que la gouvernance, l'organisation et la prestation des services, le financement et la répartition des ressources. La revue accueille favorablement les articles rédigés par des chercheurs provenant d'un large éventail de disciplines dans les sciences de la santé, les sciences sociales et la gestion, et par des équipes de recherche interdisciplinaires. Nous invitons également les décideurs ou les membres d'équipes formées de chercheurs et de décideurs à nous envoyer des articles qui traitent de l'échange et de l'application des connaissances.

Bien que *Politiques de Santé/Healthcare Policy* encourage l'envoi d'articles ayant un solide fondement théorique et innovateurs sur le plan méthodologique, nous privilégions la recherche appliquée plutôt que les travaux théoriques et l'élaboration de méthodes. La revue veut maintenir une saveur distinctement canadienne en mettant l'accent sur les questions liées aux services et aux politiques de santé au Canada. Nous publions aussi des travaux de recherche et des analyses présentant des comparaisons internationales qui sont pertinentes pour le contexte canadien.

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EDITORIAL

Federal and Provincial Governments Need To Be Transparent about Trade-Offs When They Buy Healthcare

Spending on healthcare is carefully scrutinized by the public, the media and academics because the amounts are so large and represent a very significant proportion of provincial budgets. Some quarters are calling for increases in spending, whereas others are focused on restraint owing to perceived inefficiencies and ineffectiveness. The debate over healthcare spending has continued for decades and is likely to heat up as new provincial labour agreements have *locked in* annual healthcare spending increases of at least five percent for 2023 (BC Nurses' Union 2023; ONA 2023).

Putting aside increases in taxes or borrowing, the principle of public spending is simple: the budget of available funds that support social programs, healthcare, education and transportation infrastructure is fixed. Politicians then make choices allocating available funds to the budgets of individual programs. Through this process, healthcare has been a perennial *winner* at the cost of other programs receiving less funding than sought.

If governments allocate available funding to programs or infrastructure that provides more value than all other alternatives, the province will have achieved the most with its public funds. In other words, the loss to the province and its residents from opportunities not funded is the smallest when budgets are allocated toward programs that generate the largest value. This is the foundational concept of *opportunity cost* in the field of health economics.

The same is true within programs. Allocating healthcare funding to programs that generate the most *health* realizes the highest possible value for the public spending. Ideally, these budget allocation decisions are informed by evidence such as clinical effectiveness, patients' and clinicians' perspectives and ethical practices. Health economics plays a major role in generating this evidence using the field's tools to calculate value for money and whose outputs include cost per quality-adjusted life-year (QALY).

Finding the Highest Value for Public Spending

As two healthcare policy researchers who actively partner with decision makers to improve

the value from spending on provincial healthcare systems, we decided to conduct an analysis to inform budget allocations between sectors of the provinces' healthcare systems. A priori, we knew the results would be far from perfect, but we aimed to apply a transparent, between-sectors opportunity cost framework that would generate useful valuations that could be improved over time and with new data.

Disappointingly, we failed to generate or compare sector-specific measures of outcomes or costs, which meant that we could not calculate value as they are able to do elsewhere, such as in England (Claxton et al. 2015; Lomas et al. 2019; Martin et al. 2021). Without measures of value, we were left unable to compare the *health* generated from equal investments in acute care capacity, increasing the number of long-term care beds or hiring more allied health expertise and expanding access to home care. Our inability to generate measures of value is mirrored in provincial governments' processes; outside of the area of advanced therapeutics, provinces do not require measures of value – the evidence of the *health* generated relative to the spending to achieve the outcomes – before resources are allocated. As we reflected on our own efforts, we identified three areas of work that need to be strengthened before value-based budget allocations or marginal investment decisions can be applied across the healthcare system.

The first need is data. In order to calculate value from spending in different sectors of the healthcare delivery system, information regarding the health benefit is required. As an example, consider the question of whether new funding should be allocated toward long-term care or acute care. To calculate the value of each option, the average expected improvement (or delay in decline) in quality of life needs to be measured. To do so, quality of life measures would have to be available for each sector. These data and infrastructure do not exist at a scale sufficiently robust to be useful in opportunity cost calculation in spite of some pockets of excellence where these data are embedded into the processes of care.

The second need is detailed spending and activity information. Calculations of value require detailed accounting of public spending per patient and what services they receive. Some data are available through the Canadian Institute for Health Information, although the data's comprehensiveness falls steeply outside the hospital. Long-running calls for increasing the scope of information collected from healthcare systems have gone unanswered, clouding the future for large-scale value initiatives unless the federal government makes a splashy appearance.

The third need pertains to stewardship of public resources. The management and stewardship of provincial healthcare systems have been ceded to professional managers. There are few opportunities for the public to weigh in on the allocation of public funds between healthcare programs and opining on whether the best value of public funds is spending on cancer drugs or homecare services. The public should expect that the government's healthcare funding decisions consider the spectrum of possibilities and the empirical lens that measures the "bang for the buck" in terms of health.

A Pathway for Identifying Value

In Canada, we know that the data do not support cross-sector comparisons of the value of public investments in health or healthcare. There should be discussions within the provinces regarding how their governments allocate public funds between healthcare programs. In the interim, we urge federal and provincial governments to be transparent regarding their healthcare spending deliberations and concurrently invest in data that will provide measures of value of healthcare.

In This Issue

This issue is led by a Discussion and Debate article that discusses learning health systems' pursuit of equity in healthcare. The article by Lee-Foon et al. (2023) proposes three key aspects to informing learning health systems in their pursuit: collect and use data to understand the composition of the groups the learning health system serves, have health system leaders reach consensus regarding the prioritization and definition of equity and hold learning health systems' leaders accountable for improvements in equity.

A rejoinder to the Discussion and Debate article expresses the need for learning health systems to integrate equity into learning health systems' embedded research. Written by Bierman and Mistry (2023), the article posits that equity-centred research should be a core attribute of learning health systems in order to reflect under-represented and marginalized populations.

This is followed by a Data Matters article that highlights emergency care clinical networks. Using survey methods, the article aims to describe how emergency care clinical networks were structured within health systems, how the networks functioned to adopt knowledge or quality improvement initiatives and how the networks sustained themselves. The authors concluded (Duncan et al. 2023) that significant gaps in health system data limited the ability of emergency care clinical networks to compare themselves with other networks.

This issue features a research article that explores interprovincial migration of recent healthcare graduates in Canada (Ariste 2023). Using quantitative health workforce data from the Canadian Institute for Health Information, the study reports that the province of training was a key factor in post-graduation migration. Ontario and British Columbia had the lowest rates of out-migration and the highest rates of in-migration. This study provides evidence regarding the impact of and possible policies options to interprovincial migration of healthcare workers.

In a second research article, Elma et al. (2023) use cross-sectional data to study the prevalence of features of the Patient's Medical Home among family medicine education sites across Canada. The study found that more than half of clinical family medicine training was occurring in sites that had features consistent with the practices of the Patient's Medical Home. The authors conclude that education policy that included Patient's Medical Home–type may not be concordant with this type of practice being available after graduation.

This issue's final research manuscript by Mathews et al. (2023) uses a qualitative study design to untangle the factors associated with limiting COVID-19 exposure among family physicians' practices. The authors report that family physicians received too little and irrelevant practice-specific support from provincial public health authorities that instead emphasized acute care. The authors conclude that mass assessment and testing centres would improve performance in future influenza-like pandemics.

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ÉDITORIAL

Les gouvernements fédéral et provinciaux doivent faire preuve de transparence dans l'achat de soins de santé

Les dépenses en soins de santé sont scrutées à la loupe par le public, les médias et les universitaires parce que les montants sont importants et représentent une imposante proportion des budgets provinciaux. Certains milieux réclament une augmentation des dépenses, tandis que d'autres prônent leur restriction en raison d'une inefficacité perçue. Le débat sur les dépenses en santé se poursuit depuis des décennies et devrait s'intensifier alors que les nouvelles conventions collectives provinciales prévoient des augmentations annuelles d'au moins 5 % des dépenses pour 2023 (BC Nurses' Union 2023; ONA 2023).

En mettant de côté les augmentations d'impôts ou d'emprunts, le principe des dépenses publiques est simple : le budget des fonds disponibles pour les programmes sociaux, la santé, l'éducation et les infrastructures de transport est fixe. Les politiciens font ensuite des choix en affectant les fonds disponibles aux budgets des programmes comme tels. Les soins de santé ont toujours été favorisés par cette façon de faire, au détriment d'autres programmes qui reçoivent moins de financement qu'espéré.

Si les gouvernements allouent le financement à des programmes ou à des infrastructures qui offrent plus de valeur que toutes les autres solutions, la province aura donc optimisé ses fonds publics. En d'autres termes, les pertes subies par la province et ses résidents en raison de possibilités non financées sont moindres lorsque les budgets sont alloués à des programmes qui génèrent la plus grande valeur. C'est le concept fondamental du coût d'opportunité dans le domaine de l'économie de la santé.

Il en va de même pour les programmes. Dans les services de santé, l'affectation du financement à des programmes qui génèrent le plus de santé permet d'obtenir la plus grande valeur possible pour les dépenses publiques. Idéalement, ces décisions budgétaires sont éclairées par des données probantes comme l'efficacité clinique, le point de vue des patients et des cliniciens ou les pratiques éthiques. L'économie de la santé joue un rôle important dans

la production de telles données probantes, grâce aux outils pour calculer l'optimisation des ressources et dont les extrants comprennent le coût par année de vie pondéré par la qualité (AVPQ).

Trouver la valeur la plus optimale pour les dépenses publiques

En tant que chercheurs en politiques de santé, qui œuvrons en partenariat avec les décideurs pour améliorer la valeur des dépenses consacrées aux systèmes de santé provinciaux, nous avons décidé de mener une analyse pour orienter les allocations budgétaires selon les secteurs des systèmes de santé provinciaux. À priori, nous savions que les résultats seraient loin d'être parfaits, mais nous voulions appliquer un cadre de coûts d'opportunité intersectoriels qui serait transparent et qui produirait des évaluations utiles et perfectibles au fil du temps et grâce à de nouvelles données.

Malheureusement, nous ne sommes pas parvenus à produire ou à comparer des mesures des résultats ou des coûts propres aux secteurs, donc il a été impossible de calculer la valeur comme cela se fait ailleurs, notamment en Angleterre (Claxton et al., 2015; Lomas et al., 2019; Martin et al., 2021). Sans mesure de la valeur, il est impossible de comparer la santé générée par des investissements égaux dans la capacité des soins de courte durée, l'augmentation du nombre de lits de soins de longue durée ou encore l'embauche d'une expertise en santé alliée et l'élargissement de l'accès aux soins à domicile. Notre incapacité à produire des mesures de la valeur se reflète dans les processus des gouvernements provinciaux; en dehors du domaine des thérapies avancées, les provinces n'exigent pas de telles mesures – les données sur la santé générée par rapport aux dépenses pour atteindre les résultats – avant que les ressources ne soient allouées. En réfléchissant à nos propres efforts, nous avons identifié trois domaines de travail qui doivent être renforcés pour que les allocations budgétaires ou les décisions d'investissement marginal basées sur la valeur puissent être appliquées dans l'ensemble du système de santé.

Le premier besoin est celui des données. Afin de calculer la valeur selon les dépenses dans différents secteurs du système de santé, il faut des informations sur les prestations de santé. Prenons l'exemple de nouveaux fonds qui doivent être affectés aux soins de longue durée ou aux soins de courte durée. Pour calculer la valeur de chacun de ces deux choix, il faut mesurer l'amélioration moyenne prévue (ou le retard dans le déclin) de la qualité de vie. Pour y parvenir, des mesures de la qualité de vie devraient être disponibles pour chaque secteur. Ces données et infrastructures n'existent pas à une échelle suffisamment robuste pour être utiles dans le calcul du coût d'opportunité, et ce, malgré certaines poches d'excellence où les données sont intégrées au processus de soins.

Le deuxième besoin a trait aux informations détaillées sur les dépenses et les activités. Le calcul de la valeur demande une comptabilité détaillée des dépenses publiques par patient ainsi que des services qu'ils reçoivent. Certaines données sont disponibles auprès de l'Institut canadien d'information sur la santé, bien que leur exhaustivité se situe nettement à l'extérieur

de l'hôpital. Les appels répétés en faveur d'une augmentation de la portée de l'information recueillie auprès des systèmes de santé sont restés sans réponse, ce qui assombrit l'avenir des initiatives de valeur à grande échelle, à moins que le gouvernement fédéral ne fasse une sortie éclatante.

Le troisième besoin concerne la gestion des ressources publiques. La gestion et l'intendance des systèmes de santé provinciaux ont été cédées à des gestionnaires professionnels. Il y a peu d'occasion pour le public de se prononcer sur la répartition des fonds publics parmi les programmes de soins de santé ou de décider si la meilleure valeur des fonds publics concerne, par exemple, les dépenses pour les médicaments contre le cancer ou les services de soins à domicile. Le public devrait s'attendre à ce que les décisions du gouvernement en matière de financement des soins de santé tiennent compte de l'éventail des possibilités et de l'optique empirique qui permet de mesurer le « rapport qualité-prix » en matière de santé.

Une voie pour identifier la valeur

Au Canada, nous savons que les données ne permettent pas les comparaisons intersectorielles de la valeur des investissements publics dans la santé ou dans les soins de santé. Les provinces devraient discuter de la façon dont elles répartissent les fonds publics parmi les programmes de soins de santé. Entre-temps, nous exhortons les gouvernements fédéral et provinciaux à faire preuve de transparence dans leurs délibérations sur les dépenses en soins de santé et à investir simultanément dans des données qui fourniront des mesures de la valeur des soins de santé.

Dans le présent numéro

Ce numéro débute par un article de la section Discussions et débats qui traite de la quête d'équité des systèmes de santé apprenants. L'article de Lee-Foon et al. (2023) propose trois aspects clés pour informer les systèmes de santé apprenants dans leur quête : collecter et utiliser des données pour comprendre la composition des groupes que le système de santé apprenant dessert, faire en sorte que les dirigeants du système de santé parviennent à un consensus sur l'établissement des priorités et la définition de ce qu'est l'équité et, finalement, tenir les dirigeants des systèmes de santé apprenants responsables de l'amélioration de l'équité.

Une réplique à cet article expose la nécessité pour les systèmes de santé apprenants d'intégrer l'équité dans leurs recherches. Rédigé par Bierman et Mistry (2023), l'article postule que la recherche axée sur l'équité devrait être un attribut central des systèmes de santé apprenants afin de refléter les populations sous-représentées et marginalisées.

S'ensuit un article de la section Question de données qui met en évidence les réseaux cliniques de soins d'urgence. À l'aide d'une méthode d'enquête, l'article vise à décrire comment les réseaux cliniques de soins d'urgence sont structurés au sein des systèmes de santé, comment ils fonctionnent pour adopter des initiatives d'amélioration des connaissances ou

de la qualité et comment ils se maintiennent. Les auteurs concluent (Duncan et al. 2023) que des lacunes importantes dans les données du système de santé limitent la capacité des réseaux cliniques de soins d'urgence de se comparer à d'autres réseaux.

Ce numéro présente un article de recherche qui explore la migration interprovinciale des nouveaux diplômés en soins de santé au Canada (Ariste 2023). À l'aide des données quantitatives sur la main-d'œuvre, colligées par l'Institut canadien d'information sur la santé, l'étude indique que la province de formation est un facteur clé de la migration après l'obtention du diplôme. L'Ontario et la Colombie-Britannique affichaient les taux d'émigration les plus faibles et les taux d'immigration les plus élevés. Cette étude fournit des données sur l'incidence de la migration interprovinciale des travailleurs de la santé et les options possibles en matière de politiques.

Dans un deuxième article de recherche, Elma et al. (2023) utilisent des données transversales pour étudier la prévalence des caractéristiques du Centre de médecine de famille dans les centres de formation en médecine familiale du Canada. L'étude révèle que plus de la moitié de la formation en médecine familiale clinique se déroulait dans des sites présentant des caractéristiques conformes aux pratiques du Centre de médecine de famille. Les auteurs concluent que les politiques de formation conformes au Centre de médecine de famille pourraient ne pas concorder avec le type de pratique disponible après l'obtention du diplôme.

Le dernier article de recherche du présent numéro, par Mathews et al. (2023), a recours à une étude qualitative pour démêler les facteurs associés à la limitation de l'exposition à la COVID-19 dans les cabinets des médecins de famille. Les auteurs signalent que les médecins de famille ont reçu trop peu de soutien, souvent non pertinent, propre à leur pratique de la part des autorités provinciales de santé publique, lesquelles ont plutôt mis l'accent sur les soins de courte durée. Les auteurs concluent que des centres d'évaluation et de dépistage de masse amélioreraient le rendement pour d'éventuelles pandémies de type grippal.

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Fairness for Whom? Learning Health Systems' Approach to Equity in Healthcare

Équité pour qui? : approche des systèmes de santé apprenants en matière d'équité dans les soins de santé

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Abstract

Many healthcare systems use "equity" as a catch-all term to underscore their commitment to delivering care matching users' needs. Despite its ubiquity, it is often haphazardly used and applied to care and improvement efforts. As the learning health systems (LHSs) approach gains prominence, LHS researchers have sought to embed equity into their work while

navigating systems with differing views of equity. We examine several components of equity, its definitions within LHSs and knowledge from LHSs' equity approach that could be implemented across systems. We conclude by suggesting various ways in which readers can embed equity into their respective LHSs.

Résumé

De nombreux systèmes de santé emploient le terme « équité » pour souligner leur engagement à fournir des soins correspondant aux besoins des usagers. Malgré son omniprésence, le terme est souvent utilisé au hasard pour caractériser les efforts d'amélioration ou les soins fournis. À mesure que la démarche des systèmes de santé apprenants (SSA) gagne en importance, les chercheurs tentent d'intégrer l'équité dans leur travail mais ils ont des points de vue différents sur cette notion. Nous examinons plusieurs aspects de l'équité, ses diverses définitions ainsi que les connaissances tirées du concept d'équité dans les SSA qui pourraient être mises en œuvre dans l'ensemble des systèmes. Nous concluons en suggérant diverses façons, pour les lecteurs, d'intégrer l'équité dans leur SSA.

Introduction

In recent years, the term *equity* has become a hot topic in healthcare. Healthcare systems have used it to underscore their commitment to fairness in care and patient treatment. Furthermore, equity has become part of diversity and inclusion approaches in many systems. This addition attempts to acknowledge and begin addressing decades of systemic biases that have negatively impacted the employment opportunities and treatment of marginalized groups. In many systems, *equity* has also become a catch-all term. It is used to signal to patients, funders, policy makers and partners that systems are working on delivering care in a way that critically considers its users' varied needs.

Despite this term's ubiquitous use in healthcare, a closer look reveals that it is often used in a haphazard and poorly conceived way and inconsistently applied to various facets of care. Equity, equality and disparity are frequently conflated in healthcare literature. Furthermore, *equity* and *equality* are often used interchangeably despite their differing meanings of fairness (resources provided based on need versus equal resources for all irrespective of need). Equity-specific data collection and analysis tools are sparse. Additionally, definitions of equity vary from one system to the next, yielding diverse views on this term and its significance in healthcare settings.

The learning health systems (LHSs) approach has gained national and international prominence (Bernstein et al. 2015; Friedman et al. 2015). At the same time, calls for equity-informed healthcare systems have risen. Unfortunately, LHS researchers have had to find ways to embed equity into their work while navigating healthcare systems with differing views on equity. Although LHSs are still an emerging concept with no single paradigmatic example, the LHS provides systems and scholars with the tools needed to produce and derive value from rapid-cycle research embedded within health systems (Zurynski et al. 2020).

Additionally, it may offer an innovative way to address some of the most pervasive and tenacious healthcare challenges of our time (Coley et al. 2022) through a critical equity lens. This commentary examines this lens, how equity is defined within the context of LHSs and what can be gleaned from LHSs' approach to equity that could be implemented across all sectors of healthcare.

Defining and Conceptualizing Equity

Much like healthcare systems, definitions of equity in LHSs abound. However, most LHS approaches share several aspects of equity, which are best summarized by Braveman and Gruskin's (2003) explanation of this term. They define equity in health as the void of systematic health disparities among groups that experience differing levels of social advantage and/or disadvantage. These disparities systematically place those who experience disadvantages based on various factors (e.g., race, low socio-economic status, gender identity) at worse health outcomes compared to their socially advantaged counterparts (Braveman and Gruskin 2003). Equity prompts researchers, clinicians and systems to examine these disparities and identify ways to deliver care that can reduce or eliminate the differences. Healthcare equity seeks to ensure that individuals get the care they need relative to their healthcare needs.

What Does Equity Mean in the Context of LHSs?

Incorporating equity into the LHS encourages researchers to acknowledge variations in healthcare access and outcomes based on individuals' level of healthcare needs (Fein 2005). Additionally, this incorporation prompts them to tailor resources and deliver care to individuals or populations that serve their needs. This tailoring goes beyond the traditional *one size fits all* approach to healthcare. Within LHSs, equity is a key health outcome and embedded into all healthcare sectors. Assessments of equitable approaches to care may vary from one sector to the next.

In healthcare systems such as Ontario's – Canada's most populous province (Statistics Canada 2022) – assessments may include individual (e.g., socio-demographic data collection) and population-level (e.g., Ontario Marginalization Index [ON-Marg], the Relative Index of Inequality [RII]) data collection tools. The ON-Marg is an Ontario-specific piece of the Canadian Marginalization Index. It uses various demographic indicators to measure several axes of deprivation, such as economic, ethnoracial and social marginalization. Analyzing data from the index can help researchers understand health inequities and other social problems connected to health among various populations. The RII may help identify, within a particular population, the impact of environmental, social and economic disparities; where they occur; and those most affected (Ontario Ministry of Health and Long-Term Care 2018). Public reporting of these data may entice systems to improve their delivery of equitable care to patients.

In order to understand inequities or areas for improvement in healthcare, the LHS approach requires data collection, analysis and buy-in from leadership. Data collection and

analysis are important as inequities are often not readily apparent. These requirements ensure that they are committed to frequently identifying and understanding drivers of inequities and take actionable, timely steps to address any issues found.

Additionally, it requires the frequent refinement of approaches, monitoring for equity improvement and engagement of equity-deserving groups on system design and redesign to match their needs. This commitment must occur in all sectors of the healthcare system and include diverse patients who play an active role in the work being done.

Key Barriers to Implementing Equity in LHSs

Despite the increasing interest in LHSs in Ontario, LHSs' incorporation into healthcare and the use of equity to inform LHS practices have been slow. Researchers and clinicians often remain separate (Pronovost et al. 2017), not interacting with one another unless that is critical for patients. Some healthcare leaders are committed to equity and, in tandem, building their LHS. However, even fewer have explicitly stated how their commitment will be converted into measurable actions for improvement purposes.

This conversion may be hampered by healthcare systems' policies around equity and research funding requirements, which are often in development or are non-existent. Without, for example, dedicated financing and personnel, this LHS approach cannot function. Personnel and financing are needed for analyses of the current state of healthcare systems, to find areas for improvement and recommend innovative approaches to care. Funding requirements must be changed to reflect this need. Even the Canadian Institutes of Health Research's Institute of Health Service and Policy Research has identified the need to develop policy research funding programs to accelerate the development of LHSs across Canada (CIHR 2021). Additionally, failure to create a patient engagement framework that actively seeks participation from equity-deserving groups – groups that are marginalized in healthcare due to factors such as race, socio-economic status, gender identity and sexual orientation – in healthcare system governance and co-design will likely lead to unsuccessful LHSs.

Conclusion

As interest in the use of equity to inform the LHS approach continues gaining ground in healthcare, several steps must be taken by healthcare systems when implementing this approach. We have narrowed them to three key steps.

First, equity must be made a priority, not an afterthought. Finding the best way to embed equity that mirrors the context in which LHSs reside will prompt healthcare systems to continuously view their actions through this lens and enhance care. As equity-deserving groups often vary, systems must commit to regularly collecting and analyzing patients' socio-demographic data to better understand the composition of the groups they serve. Policy makers will need to review and revise data standards to achieve this commitment. These revisions must come with changes to funding requirements that make funding contingent on

collecting this data. These changes will help define these groups and allow systems to critically examine any differences in their health and healthcare delivery.

Second, consensus must be reached by system leaders and collaborators on defining and applying equity in LHSs. A commonly used definition would enable its instrumentation and provide opportunities for continuous learning. This would ensure that researchers implement this concept in an easily understood, reproducible and consistent way.

Finally, institutions must include measures that hold systems and their leaders accountable, with steps taken if negative outcomes occur. One way to achieve this is through an LHS equity checklist. This checklist would be developed through a patient engagement framework and parallel key components of the LHS. Working with patients on an ongoing basis will be critical to ensuring that its contents are relevant and helps healthcare systems identify the tools needed to assess the state of their equity-informed research and practices. This checklist would mirror key aspects of healthcare delivery tools and services. It would include various agreed-upon measures and performance management systems. Ultimately, these steps and more will help create a truly just and equitable healthcare system.

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Commentary: Achieving Health Equity – The Role of Learning Health Systems

Commentaire : Atteindre l'équité en santé – Le rôle des systèmes de santé apprenants

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Abstract

Achieving health equity, for decades a domain of high-performing health systems, has been elevated to a priority and recognized as a central objective of health system transformation and quality improvement efforts. By prioritizing health equity; developing, implementing and evaluating models of care that optimize individual and population health; developing strong partnerships with patients and communities; conducting research to generate evidence on the effectiveness of interventions across diverse populations; implementing strategies to integrate clinical care, public health and social care; and participating in multisector collaborations to address social needs, learning health systems can play a pivotal role in eliminating health inequities.

Résumé

Atteindre l'équité en santé, une notion qui pendant des années a été le fief des systèmes de santé très performants, est devenu une priorité et un objectif central dans le cadre des efforts de transformation du système et d'amélioration de la qualité des soins. Les systèmes de santé apprenants peuvent jouer un rôle central dans l'élimination des inégalités en santé, et ce, en accordant la priorité à l'équité en santé; en élaborant, en mettant en œuvre et en évaluant des modèles de soins qui optimisent la santé des personnes et des populations; en établissant de solides partenariats avec les patients et les collectivités; en menant des recherches pour

produire des données probantes sur l'efficacité des interventions dans diverses populations; en mettant en œuvre des stratégies pour intégrer les soins cliniques, la santé publique et les soins sociaux; et en participant à des collaborations multisectorielles pour répondre aux besoins sociaux.

Introduction

The COVID-19 pandemic raised awareness of pervasive inequities in health and healthcare and the considerable shortcomings of our health systems. In response, achieving health equity, for decades a domain of high-performing health systems, has been elevated to a priority and recognized as a central objective of health system transformation and quality improvement efforts. The original triple aim, enhancing patient experience, improving population health and reducing costs, first expanded to the quadruple aim: addressing clinician burnout. The quintuple aim, once more extended, now includes advancing health equity (Nundy et al. 2022). Despite heroic efforts, the failure of health systems to mount an adequate response to the pandemic has focused attention on the critical role of learning health systems (LHSs) in achieving these aims. Lee-Foon and colleagues (2023) argue that LHSs need to prioritize health equity and develop a consensus definition that they can then operationalize in partnership with the people and communities they serve to ensure the delivery of more equitable care.

Equity in Health and Healthcare

Inequities in healthcare contribute to and exacerbate health inequities. The social determinants of health (SDoH) are primary drivers of health inequities, greatly increasing the risk of developing illness, disability and premature aging (weathering) (Hooten et al. 2022) among socio-economically disadvantaged individuals and populations and racial and ethnic groups experiencing bias, discrimination and racism. Inequities in access to and quality of care have been well documented, contributing to an increased burden of illness and widening health inequities. Eliminating health inequities will require addressing the socio-economic, environmental and societal factors, including structural racism that produces them, and should be a primary goal of health system transformation. LHSs can play a central role in efforts to achieve health equity by developing, implementing and evaluating models of care that optimize individual and population health and tailoring interventions to improve the health, functional status and well-being among those with a higher burden of health and disability due to SDoH and discrimination.

Learning Health Systems and Health Equity

LHSs improve quality and outcomes of care through a continuous cycle of evidence synthesis, implementation and generation (Institute of Medicine 2015). Large integrated health systems, community and safety net hospitals, practice networks and individual practices can all function as LHSs. By bringing together the caring and learning functions of healthcare

delivery, they can make progress toward the quintuple aim, including improving patient experience (e.g., respectful care for all) (Montori et al. 2019). By seamlessly integrating research into care delivery, LHSs are uniquely positioned to generate critical real-world evidence about the effectiveness of clinical interventions as well as evidence for models of care and interventions to advance health equity. They can answer the critical questions of what works, for whom and how we make it work. The increasing availability of data from multiple sources to foster research, coupled with innovative study design and analytic methods (e.g., agile implementation, rapid-cycle evaluation, natural language processing), can accelerate learning.

To advance health equity, LHSs can build upon a large body of literature, including quantitative, qualitative and mixed-methods research on the epidemiology of health inequities, their root causes and interventions to address them. Quantitative data can provide information on the patterns and magnitude of inequities and the effectiveness of interventions. Qualitative studies and meta-syntheses can provide insights into the experience of individuals and communities as well as potential solutions, as was done in understanding barriers to accessing care and strategies to overcome them among diverse groups of women in Ontario (Angus et al. 2013; Lombardo et al. 2014). A mixed-methods approach strategically integrates quantitative and qualitative methods to produce more robust findings that produce nuanced results and broaden the applicability of smaller-sample qualitative findings. Including patients, caregivers, communities, front-line clinicians and health system staff in the co-design of interventions and the co-development of evidence will increase the probability of success of LHS efforts to advance health equity. Learning collaboratives among LHSs could support shared learning on how to effectively incorporate a health equity lens as a routine component of quality improvement efforts and on how to overcome the many obstacles in realizing the objectives of a well-functioning LHS.

Embedded Research and Health Equity

Embedded research within LHSs fosters collaboration with stakeholders to produce novel insights and evidence that can be rapidly implemented and continually improved to optimize outcomes of individuals, populations and overall health system performance (Forrest et al. 2018). The promise of embedded research is in its nimbleness and ability to be responsive to health system priorities (Gould et al. 2020). As Lee-Foon et al. (2023) and others have noted, there is a need for shared definition for equity and positioning equity as a foundational pursuit coupled with meaningful, person-centred equity metrics, developed to achieve and sustain equity (Coley et al. 2022; Parsons et al. 2021). Equity-centred research must intentionally focus on centring both people and process simultaneously (Parsons et al. 2021). This ensures that *all* voices, particularly those from historically marginalized populations and communities, are included, heard and valued equally through participatory and user-centred design methods such as co-development, an explicit focus on power and resources distribution in the research and reaching beyond the traditional walls of the healthcare system to engage new partners.

The call for the integration of equity into embedded research has influenced training and mentoring programs to develop the LHS workforce (Lozano et al. 2022; Yano et al. 2021). In 2016, the Agency for Healthcare Research and Quality (AHRQ) recommended requisite competencies for LHS science; however, health equity was not a domain (Coley et al. 2022; Forrest et al. 2018). In 2021, through a consensus-based process, the AHRQ LHS competencies were updated to include a "Health and Healthcare Equity and Justice" domain (AHRQ 2022). AHRQ, in partnership with the Patient-Centered Outcomes Research Institute (PCORI), supported the training of embedded researchers to conduct patient-centred outcomes research within LHSs. The Learning Health System Centers of Excellence K12 program was launched in 2018 with more than $40 million in awards over five years to 11 institutions to grow and foster the next generation of embedded researchers (AHRQ 2022). The K12 Learning Collaborative fostered collaboration, distilled learnings and shared best practices among the Centers. To strengthen the integration of health equity across the continuum of training, the scholars and trainees within the K12 program developed recommendations to help operationalize efforts to centre equity to inform future training efforts (Coley et al. 2022). The recommendations focused on the integration of equity within each competency domain; the development of training and mentorship focused explicitly on equity in an LHS context, evaluation of training and impact, recruitment of diverse scholars and ensuring that communities are partners in research. Leveraging the recommendations and evaluation findings from the K12 program, AHRQ and PCORI, in the winter of 2023, will launch a new P30 Learning Health System Embedded Scientist Training and Research (LHS E-STaR) program (https://grants.nih.gov/grants/guide/rfa-files/RFA-HS-23-001.html) to build new models of LHS infrastructure to strengthen institutional research training and explicitly centre health equity.

Aligning Forces to Achieve Health Equity

Although LHSs can play a vital role in advancing health equity, they can't do it alone. Over a decade ago, after finding significant inequities on multiple measures of access, quality and outcomes of care in Ontario, the Project for an Ontario Women's Health Evidence-Based Report (POWER) Study produced a Health Equity Road Map (Appendix 1, available online at longwoods.com/content/27236) outlining 10 steps for achieving health equity in the province (see Table 1 and Appendix 1) (Bierman et al. 2012). These steps, the first being "[e]quity, a major attribute of high-performing health systems and important dimension of health care quality, is key to health system sustainability and needs to be a priority" (Bierman et al. 2012: 29), continue to resonate. The second, "[h]ealth equity cannot be achieved without moving upstream and addressing the root causes of disease in the social determinants of health" (Bierman et al. 2012: 29), underscored the need for health systems to partner with other sectors to advance and sustain health equity. It is not possible to control diabetes if a person is food insecure or control asthma continually exacerbated by substandard housing.

TABLE 1. POWER Study: Health Equity Road Map

1.	Equity, a major attribute of high-performing health systems and important dimension of healthcare quality, is key to health system sustainability and needs to be a priority.
2.	Health equity cannot be achieved without moving upstream and addressing the root causes of disease in the social determinants of health.
3.	Prioritize chronic disease prevention and management to improve overall population health and reduce health inequities.
4.	Focus on patient-centredness to improve access to, satisfaction with and outcomes of care for all.
5.	Province-wide, integrated, organized models of care delivery can improve health outcomes and reduce inequities in care.
6.	Coordinate population health, community and clinical responses.
7.	Link community and health services to optimize outcomes and improve efficiency.
8.	Implement a health equity measurement and monitoring strategy and routinely include gender and equity analysis in health indicator monitoring.
9.	Develop strategies for effective implementation by creating learning networks and designing innovations for scale-up and spread.
10.	Create a culture of innovation and learning while building the evidence base for accelerated improvement through rigorous evaluation and research.

POWER = Project for an Ontario Women's Health Evidence-Based Report.

Strategies to foster cross-sector partnerships are growing. In the US, the Centers for Medicare & Medicaid Services are encouraging screening and referral for health-related social needs. The Department of Health and Human Services, led by the Agency for Community Living, is supporting community hubs to bring together social and community services in a given geographical region and facilitate access to the services that they provide to individuals cared for by health systems and health plans (Chappel et al. 2022). The US Department of Health and Human Services has developed a three-pronged strategy to address social determinants, including (1) better data, (2) improving health and social services connections and (3) whole-of-government collaborations, and has issued a call to action to address health-related social needs (De Lew and Sommers 2022; US Department of Health and Human Services [HHS] 2023). The Biden administration has published the *Social Determinants of Health Playbook*, which provides information on how multiple sectors can come together to address the SDoH (Domestic Policy Council 2023). State multi-sector plans on aging provide an example of holistic approaches to improve the health and well-being of older adults (Ipakchi et al. 2023). LHSs can be a vital partner in tackling inequities in health by addressing SDoH and social needs. Without an explicit focus on social factors, LHSs may fail to reach their full potential of improving health (Palakshappa et al. 2020).

Conclusion

LHSs are in their infancy and often more aspirational than operational. By prioritizing health equity; developing strong partnerships with patients and communities; conducting research to generate needed evidence on the effectiveness of interventions across diverse populations; implementing strategies to integrate clinical care, public health and social care; and

participating in multi-sector collaborations to address the SDoH, LHSs can play a pivotal role in eliminating long-standing, pervasive and unjust health inequities.

Disclaimer

The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Agency for Healthcare Research and Quality or the United States government.

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A Global Survey of Emergency Care Clinical Networks: Discussion and Implications for Canadian Learning Health Systems

Enquête mondiale sur les réseaux cliniques de soins d'urgence : discussion et répercussions sur les systèmes de santé apprenants au Canada

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Abstract

Clinical networks (CNs) can promote innovation and collaboration across providers and stakeholders. However, little is known about the structure and operations of CNs, particularly in emergency care. As Canada advances learning health systems (LHSs), foundational research is essential to enable future comparisons across CNs to identify those that contribute to positive system change. Drawing from the results of our international survey, we provide a description of 32 emergency care CNs worldwide, including their structure, operations and sustainability. Future research should consider the context of such networks, how they may contribute to an LHS and how they impact patient outcomes.

Résumé

Les réseaux cliniques (RC) peuvent favoriser l'innovation et la collaboration entre les fournisseurs et les intervenants. Cependant, on en sait peu sur la structure et le fonctionnement des RC, en particulier dans les soins d'urgence. Alors que le Canada s'intéresse aux systèmes de santé apprenants (SSA), la recherche fondamentale est essentielle pour permettre d'éventuelles comparaisons entre les RC afin de déterminer ceux qui contribuent au changement positif dans un système. À partir des résultats de notre enquête internationale, nous fournissons une description de 32 RC de soins d'urgence dans le monde, y compris leur structure, leurs activités et leur durabilité. Les recherches futures devraient tenir compte des contextes de ces réseaux, de la façon dont ils peuvent contribuer à un SSA et de leur incidence sur les résultats pour les patients.

Introduction

Clinical networks (CNs) are voluntary groupings that use a collegial approach to identify and implement a range of strategies to improve clinical care and service delivery (Haines et al. 2012). Specific definitions, features and nomenclature vary but include interorganizational liaison, significant clinical input, "bottom-up" perspectives, multidisciplinarity, patient inclusion and evidence-based care (McInnes et al. 2012). CNs provide a potential means to improve care delivery by developing systems that convert key processes and outcomes into data and subsequently use the knowledge gained from analyzing that data to improve practice. An operational definition is provided in Box 1.

There are numerous challenges to CNs achieving optimal performance. Research and improvement initiatives, even within the same health system, can be uncoordinated and run in parallel silos, leading to duplication and fragmentation of work (Lamontagne et al. 2021). Although CNs have the potential to bridge clinical care, quality improvement and research cultures, their formal integration into the healthcare delivery system varies. To understand best practices, more detail is required on the operations, structure, sustainability and impact of existing networks.

Health system "embedded" CNs are ideally situated to operate in a learning health system (LHS) framework (see Box 1) (Institute of Medicine [US] et al. 2011). This is of

BOX 1. Operational definitions

Learning health system: A framework "designed to generate and apply the best evidence for the collaborative healthcare choices of each patient and provider; to drive the process of discovery as a natural outgrowth of patient care; and to ensure innovation, quality, safety, and value in health care" (Institute of Medicine [US] et al. 2011: 1).

Emergency care: An urgent health service that "cross-cuts traditional disease-focused disciplines and provides prompt interventions for many disease-specific emergencies. However, well-organized emergency care appropriately distributed across a country allows for timely coordination of services and resources and optimum efficiency and efficacy in treating a range of acute conditions, from out-of-hospital care at the scene of an injury or illness to treatment and stabilization in the emergency unit and early operative and intensive care" (Burkholder et al. 2019: 1).

Clinical network: "A structure for liaising across institutions, allowing greater clinical input into models of service delivery; provide 'bottom up' views on the best ways of tackling complex healthcare problems and are usually multidisciplinary involving doctors, nurses, allied health professionals, scientists, managers, and consumers" (McInnes et al. 2012: 1).

increasing relevance as the Institute of Health Services and Policy Research at the Canadian Institutes for Health Research has identified the need to establish and accelerate the LHS as a strategic priority (CIHR 2021). At the time of the survey, there were two emergency care clinical networks (ECCNs) in Canada – the BC Emergency Medicine Network (BC EMN) and the Emergency Strategic Clinical Network in Alberta – that conducted similar activities (Manns and Wasylak 2019; McLane et al. 2019) and sought to function as LHSs (Abu-Laban et al. 2018, 2019; Christenson 2014; Drebit et al. 2020; Ho et al. 2021).

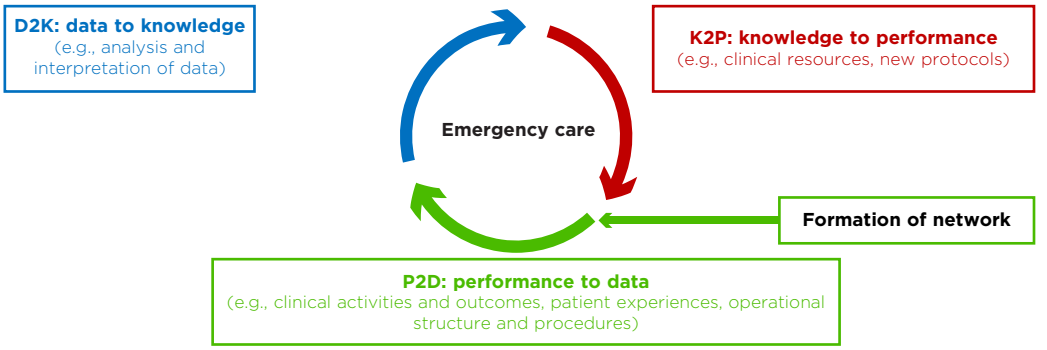
ECCNs, as with other CNs, translate practice to data and implement new knowledge from research or quality improvement back to practice (Figure 1). Understanding the scope and framework of these organizations may provide guidance on how best to incorporate successful elements of highly functional CNs to optimize the LHS. This paper describes and provides context on the results from an international survey to identify ECCNs and their structure, operations and sustainability (Roerig et al. 2021).

Methods

As this paper highlights the data and policy implications that arose from previous work by our group, detailed methods and materials are described elsewhere (Roerig et al. 2021).

The research team obtained access to membership organizations of the International Federation of Emergency Medicine (IFEM), representing nearly 100 nations (Abu-Laban 2020), and undertook a two-phased approach to data collection. In phase 1, we used an

FIGURE 1. The learning cycle of an emergency care clinical network



Source: Adapted from Friedman et al. (2017).

e-mail including our project objectives and operational definitions (Burkholder et al. 2019; Institute of Medicine [US] et al. 2011; McInnes et al. 2012) to inquire if IFEM members believed that an ECCN existed in their jurisdiction and achieved a 75% response rate. If yes, we asked for the contact information of the identified networks for phase 2 of data collection. We contacted those networks to ask if they would complete a survey using a modified Dillman process that re-engaged those contacts over 10 days from the initial invitation for a total of four times. If identified network contacts did not respond, the research team captured information on the survey questions from publicly available data where possible (Roerig et al. 2021). A flow diagram of this process is provided in the previous report (Roerig et al. 2021). The design of the survey was inspired by the "pillars" necessary for LHS functionality from Menear et al. (2019). Thematic grouping of results was done by the research team to aid interpretation following survey completion.

The survey materials (Roerig et al. 2021) were approved by the University of British Columbia Office of Research Ethics (#H20-02477).

Results

Identifying ECCNs

Forty ECCNs were invited to participate in phase 2. Of those, 24 network contacts or representatives returned a completed survey, and for an additional eight ECCNs, there was sufficient publicly available information, leading to a final sample of 32 ECCNs. Those 32 networks include 21 national-level networks and three supernational networks, collectively representing approximately 90 independent countries (Abu-Laban 2020). Table 1 (available online at longwoods.com/content/27235), provides the characteristics of the included ECCNs. In our original review, we identified 11 ECCNs that appear to support an LHS framework (Roerig et al. 2021).

Governance and membership

Although all ECCNs involve physicians, the involvement of other membership groups varies. The two Canadian ECCNs are among the most inclusionary and were among the 38% of ECCNs with participation from four or more groups. Most ECCNs have a formal governance structure (88%) composed of network members, leaders and a board. Who initially developed the network also varies, with the largest plurality being providers (44%), followed by a combination of providers and health system administrators (16%) and health system administrators alone (13%). Network development was not reported or available for 25% of ECCNs. Canadian ECCNs stood out in comparison to global peers as the BC EMN was the only ECCN developed by providers in partnership with academics and the Alberta ECCN was one of the few developed primarily by health system administrators (13%). Membership size varied greatly – from fewer than 50 members to some 10,000. Even in the Canadian context, a large difference in scale exists, with the British Columbia ECCN having a membership of over 1,200 and the Alberta one having a membership of fewer than 100. Identifying governance principles and membership of networks is important to assess their alignment with LHS values such as "inclusiveness," "accessibility" and "transparency" (p. 2) as described by Friedman et al. (2017).

Funding

Only 20 ECCNs reported dedicated funding (63%). Both Canadian ECCNs reported that their funding was provided from governmental and non-governmental organizations, whereas only 25% of ECCNs globally were funded in this manner. Other funding sources include membership fees (34%), conferences and events (9%), grants (6%) and fundraising/donations (6%). For ECCNs that reported having funding, the majority have ongoing arrangements (85%). The BC EMN, however, reported their funding sources to be variable and determined annually. Sustainability is a key concern for all health systems and is an integral part of planning a successful LHS (Menear et al. 2019); consequently, any analysis of meso-level organizations, such as ECCNs, must capture funding data.

Limitations

Definitions of CNs are frequently inconsistent (Brandes et al. 2013; Haines et al. 2012), which may have complicated identification of networks in phase 1. This likely resulted in varied interpretations of what constituted an ECCN in phase 1 and is a probable factor in heterogeneity across identified ECCNs. Similarly, although we intended "research activity" to be understood using conventional academic understandings, respondents' conceptions could have varied. The global nature of this survey also precluded examination of regulatory and incentive structures. Finally, our findings represent a snapshot of ECCNs surveyed during the COVID-19 pandemic and thus may not reflect pre- or post-pandemic structures.

Our survey was created iteratively, informed by experts and literature. It did not involve a systematic review or meta-analyses. Study materials were only made available in English

and relied on IFEM membership, American College of Emergency Physicians chapters and literature searches to identify networks. We did not capture details on what specific data ECCNs collect, such as electronic health record integration, nor did we validate survey responses. Doing so could be the focus of future work.

Discussion and Implications for Canadian ECCNs and Learning Health Systems

Activities

Nearly all ECCNs provide clinical resources (90%) and participate in continuing professional development (90%). Most participate in research (74%) and almost half include real-time support (48%). Nearly all ECCNs operate two or more activities (97%). Notably, only three ECCNs, including the two Canadian ECCNs, have any formal evaluation of their network.

Data implications

From these activities, we can make inferences regarding the data collected and knowledge produced by ECCNs as part of a theoretical learning cycle. The generation of clinical resources and professional development programs suggests that ECCNs are synthesizing knowledge emerging from clinical practice learning. Research participation suggests that many ECCNs actively contribute to the scientific understanding of their local system, and in fact, some are engaged beyond local data systems. Notably, both Canadian ECCNs actively measure the impact of their activities on the component of the health system under their mandate (here provincial), in contrast to 25% of ECCNs globally. Network- or organization-level evaluation is particularly complex and uncommon even in Canada outside the identified ECCNs (Abu-Laban et al. 2022). This is a realm where British Columbia and Alberta ECCNs may show leadership.

The survey data presented in Table 1 reflect variables that would ideally be captured for CNs broadly. Currently, data on these networks and other meso-level organizations in the Canadian health system are often not captured in the routine, standardized manner that patient- or provincial-level strata are, constituting a "missing middle" in our data landscape. Although the survey was initially a way for the EMN to identify potential peers for comparison, we came to realize that further coordination and capture of data are required to understand the role of ECCNs and other networks in affecting the health of Canadians. The current data landscape in Canada does not provide adequate coverage for us to identify meso-level hubs of learning, their successes and barriers and comparison across such centres for ongoing improvement.

Policy implications

In addition to a dearth of data regarding ECCNs and similar meso-level organizations within the health system, key performance indicators for evaluating the "success" of CNs remain

largely undefined and lack accepted standards, both in Canada and internationally. Greater efforts by provincial ministries to identify, embed and make data available on ECCNs and similar organizations would aid in the development of such standards and encourage future successes.

Finally, as LHS implementation is an identified Canadian priority (CIHR 2021), targeted efforts to facilitate the identification, understanding, integration and impact of ECCNs, and CNs generally, are required for more effective understanding of best network practices.

Data Sources and Permissions

Survey data in this article have been drawn from a previously published rapid review:

Roerig, M., S. Carbone, M. Lynch, R. Abu-Laban, R. Duncan, G. Marchildon et al. 2021, March. An International Review of Emergency Care Clinical Networks. North American Observatory on Health Systems and Policies. *Rapid Review* (31).

This commentary has been written by the same authorship team, and we grant permission for use of the survey data for that purpose.

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RESEARCH PAPER

Distribution and Migration of Recent Healthcare Graduates in Canada

Répartition et migration des nouveaux diplômés en soins de santé au Canada

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Abstract

Introduction: Although data on new graduates are available and typically included in the health workforce planning (HWP) model, information on their interprovincial migration pattern is less known. This paper aims to understand the mobility pattern of recent healthcare graduates – family physicians and regulated nurses – across the different Canadian jurisdictions.

Methodology: Health workforce data from the Canadian Institute for Health Information (CIHI) were used to identify recent family physician and regulated nurse graduates. We identified new graduates (between 2015 and 2019) in a particular province and distributed them according to the province/territory in which they registered to practise.

Results: The jurisdiction where they are trained is a key factor in determining their migration rates. For both professions, Ontario and British Columbia have the lowest rates of new graduate out-migration and the highest rates of in-migration, leaving them with a positive net interprovincial migration.

Discussion: This analysis can be used to inform better HWP at the jurisdictional level in these professions.

Conclusion: Working and community conditions matter to keep and attract new graduates.

Résumé

Introduction : Bien que les données sur les nouveaux diplômés soient disponibles et généralement incluses dans les modèles de planification de la main-d'œuvre en santé, l'information sur les tendances migratoires interprovinciales est moins connue. Ce document vise à comprendre le schéma de mobilité des nouveaux diplômés en soins de santé – médecins de famille et infirmières réglementées – parmi les différentes administrations au Canada.
Méthodologie : Les données sur la main-d'œuvre en santé, provenant de l'Institut canadien d'information sur la santé (ICIS), ont été utilisées pour identifier les médecins de famille et infirmières réglementées récemment diplômés. Nous avons repéré les nouveaux diplômés (entre 2015 et 2019) dans une province particulière et nous les avons répartis selon la province ou territoire où ils se sont inscrits pour exercer.
Résultats : La province ou le territoire où ils reçoivent la formation est un facteur clé pour déterminer leurs taux de migration. Pour les deux professions, l'Ontario et la Colombie-Britannique connaissent les taux les plus faibles d'émigration des nouveaux diplômés et les taux les plus élevés d'immigration, ce qui donne une migration interprovinciale nette positive.
Discussion : Cette analyse peut servir à éclairer, pour ces professions, une meilleure planification de la main-d'œuvre en santé au niveau de la province ou du territoire.
Conclusion : Les conditions de travail et communautaires sont importantes pour garder et attirer de nouveaux diplômés.

Introduction

During the last few decades, Canada has been facing health workforce–related challenges. The situation has been exacerbated by the COVID-19 pandemic to create an unprecedented level of staffing issues in all jurisdictions, with a higher impact on some. These shortages undermine the ability of the healthcare system to provide timely access to high-quality care for everyone in Canada. There are two drivers of the health workforce crisis. On the one hand, the supply of healthcare providers includes factors such as stock of providers, inflow, distribution and aging of the workforce. On the other hand, the demand for healthcare (also known as population needs) encompasses disease prevalence and population aging, for example. However, the focus of this study is on the supply side, particularly the distribution. The pattern of health workforce distribution is as important as the aggregate supply. Interprovincial migration is one of the important factors that may potentially affect the regional distribution of physicians.

In this context, jurisdictional health workforce planning (HWP) plays an increasingly important role. Although data on new Canadian graduates and international healthcare graduates are available and typically included in the HWP model, information on their interprovincial migration pattern is less known. In the few studies where this question is addressed, physicians and nurses are considered separately. In practice, these two professional categories work in a team to provide healthcare. Looking at their interprovincial migration

pattern in the same study could help us better understand the similarities and differences between these professions. The objective of this analysis is to understand the mobility pattern of recent healthcare graduates – specifically family physicians (FPs) and regulated nurses – across the different Canadian jurisdictions. This can provide better insights into the issue of health workforce supply and shortage, which is so topical in the Canadian healthcare system.

Literature Review

There are a few studies on the migration of physicians in Canada (e.g., Basu and Rajbhandary 2006; Mou and Olfert 2015). However, the literature specifically on migration of new graduates (after completing the residency) is relatively scant. Patterns and predictors of physician movements can be classified into two main categories: personal and professional. Personal factors include, among others, age as young male and single physicians are more likely to move than their counterparts (Basu and Rajbhandary 2006; Vanasse et al. 2009). Cultural and family reasons are also important: migration is a family decision, and spousal characteristics matter (McDonald and Worswick 2012). The Canadian Institute for Health Information (CIHI) has also factored years after graduation: physicians usually move to other provinces within the first five years of establishing a medical practice (CIHI 2009).

Professional factors include the level of compensation and working conditions (Benarroch and Grant 2004), but another study found mixed evidence for income and a greater role for community characteristics (Mou and Olfert 2015). It should be acknowledged that other professional factors, such as dissatisfaction with professional life and professional relationships (Vanasse et al. 2009) and burnout and excessive workload (Mainous et al. 1994; Nestman 1998), are more relevant to experienced physicians and may not be applied to new physicians.

Studies addressing the topic of nurse migration in Canada are relatively sparse, particularly in the context of new graduates. The CIHI (2002) looked at the supply and distribution of registered nurses in rural and small-town Canada. More recent existing ones focus mostly on international migration (Covell et al. 2017; Hillman et al. 2022; WHO 2017). Nourpanah et al. (2018) admitted that mobility is relatively understudied among healthcare workers. They undertook a qualitative study to understand the policies that impact the mobility of healthcare workers in Nova Scotia (NS), Canada. The authors focused on the mobility of registered nurses (RNs), licensed practical nurses (LPNs) and continuing care assistants (CCAs). They outlined four key intersecting policy contexts: international labour mobility and migration, interprovincial labour mobility, provincial credential recognition and workplace and occupational health and safety. To our knowledge, no study has used administrative data to simultaneously look at the interprovincial migration of new physician and nurse graduates in Canada to determine the similarities and differences, particularly in recent years.

Data and Methodology

Secondary health workforce data from the CIHI were used to conduct this quantitative research. We identified recent Canadian-educated medical graduates, as well as regulated nurse graduates and tracked their retention and migration rates. The physician data were sourced from Scott's Medical Database (SMDB). Physician data include active physicians in clinical and non-clinical practice who have a medical degree and a valid mailing address. The data exclude residents, physicians in the military, semi-retired and retired physicians and physicians who requested that their information not be published. See CIHI (2022c) for the methodology notes details.

Only FPs are considered in this analysis. They include general practitioners, family medicine specialists and emergency family medicine specialists who are certificants of the College of Family Physicians of Canada or the Collège des médecins du Québec. More specifically, FP data include new medical graduates (NMGs) between 2015 and 2019 in a particular province. Then the data were broken down according to the province or territory in which the FPs registered to practise in 2021 (cross-tabulation). The two-year lag between graduation and registration is considered to allow for the required residency period for FPs.[1] International migration is out of scope in this study. Prior to 2004, it was a relatively important phenomenon to be considered. However, since then, more Canadian medical graduates were returning from abroad than were leaving, and the current outflow is negligible (Freeman et al. 2016).

The nursing data were sourced from the Health Workforce Database (HWDB) and include all regulated nurses (nurse practitioners, RNs/registered psychiatric nurses in the four western provinces and LPNs [called registered practical nurses in Ontario]). More specifically, new nursing graduates (NNGs) in a specific province during the same five-year period are considered in this analysis. No lag period between graduation and registration was considered for nurses.

The out-migration rate for either FPs or nurses is the number of trainees who started working in a different jurisdiction from where they received their degrees divided by the total number of trainees. The rate of new physicians or nurses residing in a jurisdiction is the sum of new graduates/trainees retained and migrating in the jurisdiction divided by the total number of trainees. If this rate is higher (lower) than 100%, this means that the jurisdiction has a positive (negative) net interprovincial migration or a net gain (loss). The lower the rate, the higher the net loss.

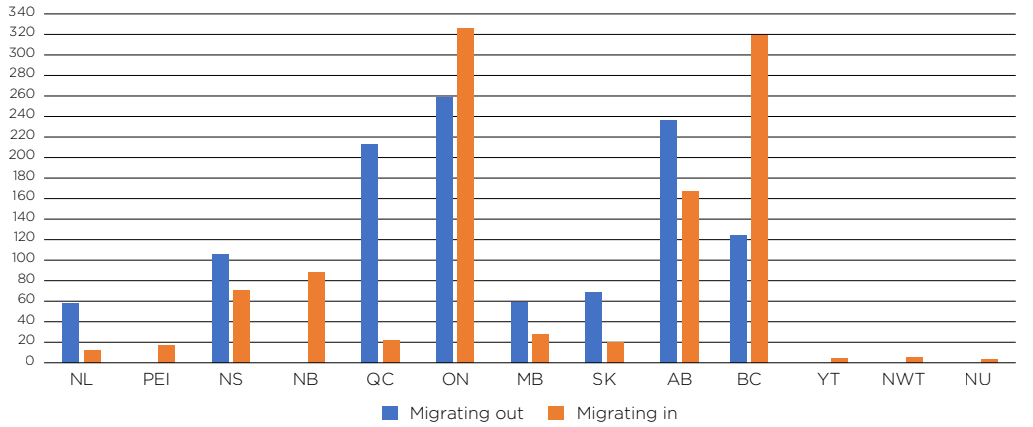
Findings

Family physicians

Among the 4,380 FP graduates in Canada during the five-year period, 1,698 (38.8%) were in Ontario (ON), followed by Quebec (QC), 831 (19.0%); Alberta (AB), 633 (14.4%); and British Columbia (BC), 567 (12.9%). The remaining 651 (14.9%) were shared between

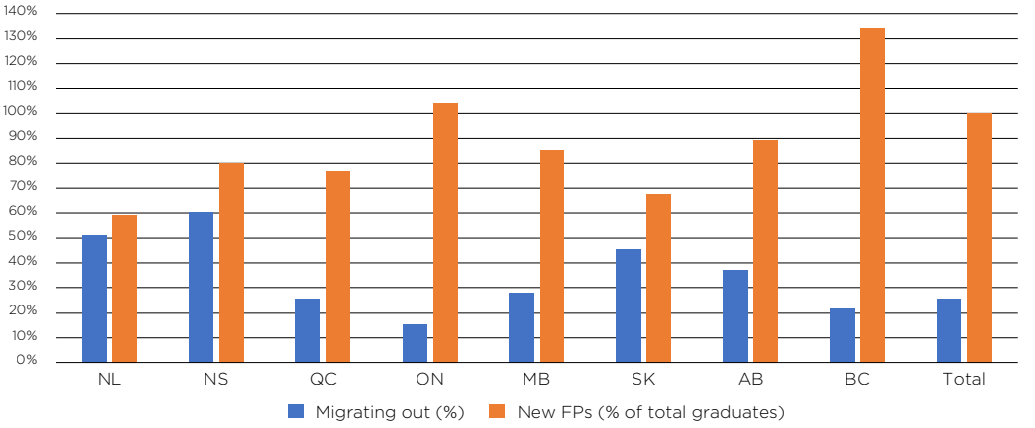
Manitoba (MB), NS, Saskatchewan (SK) and Newfoundland and Labrador (NL), in decreasing order. No independent medical schools are located in Prince Edward Island (PEI), New Brunswick (NB) and the territories (Northwest Territories [NWT], Yukon [YT], and Nunavut [NU]), although Dalhousie University's Faculty of Medicine has a campus in NB. Figures 1 and 2 depict the migration of these NMGs, showcasing their number (Figure 1) and the rate (Figure 2) of those migrating out and those residing in.

FIGURE 1. Number of FP graduates between 2015 and 2019 migrating out of/into Canadian jurisdictions in 2021



Source: Author's calculations based on CIHI (2022a).
Excludes physicians where the province of graduation from medical school is unknown.
Jurisdictions with no migrating-out figures have no dedicated medical schools.
The number of family medicine graduates in NS by province/territory of registration may include graduates of the Dalhousie University Faculty of Medicine from both the NS and NB campuses.
AB = Alberta; BC = British Columbia; FP = family physician; MB = Manitoba; NB = New Brunswick; NL = Newfoundland and Labrador; NS = Nova Scotia; NWT = Northwest Territories; NU = Nunavut; ON = Ontario; PEI = Prince Edward Island; QC = Quebec; SK = Saskatchewan; YT = Yukon.

FIGURE 2. Percentage of FP graduates between 2015 and 2019 migrating out of and residing in Canadian jurisdictions in 2021



Source: Author's calculations based on CIHI (2022a).
Jurisdictions with no dedicated medical schools do not have migrating-out figures and are not represented on this chart.
AB = Alberta; BC = British Columbia; FP = family physician; MB = Manitoba; NL = Newfoundland and Labrador; NS = Nova Scotia; ON = Ontario; QC = Quebec; SK = Saskatchewan.

At the national level, the NMG migration rate was around 25% – more precisely, 25.7% (1,126) for migrating out and 24.7% (1,082) for migrating in, excluding international migration. BC and ON were the only two provinces with a positive net interprovincial NMG migration. The numbers of migrating-out/migrating-in NMGs for BC were 124/319, resulting in a net gain of 195 NMGs and a rate of residing in of 134.4% of their total graduates. As for ON, the numbers of NMGs migrating out/migrating in were 259/326 (resulting in a net gain of 67 NMGs and a rate of residing in of 103.9% of their total graduates). So BC and ON were best able to retain the highest proportion (≥ 78%) of their NMGs and attract the highest proportion of NMGs from other provinces (≈ 30%).

That was not the case for the rest of the provinces, for which the share of migrating in is well below the national average and which experienced negative net interprovincial NMG migration. In absolute terms, the net loss was the strongest in QC (191), followed by AB (69), SK (49), NL (46), NS (35) and MB (31). However, in relative terms, the net loss was more pronounced in NL, followed by SK, QC and AB, with residing-in new physicians representing, respectively, 59.3%, 67.5%, 77.0% and 89.1% of their total graduates.

Let us turn our attention to which provinces contribute more to the BC and ON net gain. Table 1 (available online at longwoods.com/content/27234) shows the provinces of NMGs between 2015 and 2019 (vertical axis) and their jurisdictions of registration in 2021 (horizontal axis).

Among the 762 NMGs residing in BC, 443 graduated and stayed in the province, whereas 319 graduated elsewhere and migrated in BC. The provinces of origin are as follows: 116 (36.4%) came from AB, 110 (34.5%) from ON, 27 (8.4%) from SK, 24 (7.5%) from QC, 21 (6.6%) from MB and the remaining 21 (6.6%) from NS (13) and NL (8). Among the 1,765 NMGs residing in ON, 1,439 graduated and stayed in the province, whereas 326 graduated elsewhere and migrated in ON. The provinces of origin are as follows: 98 (30.1%) came from QC, 92 (28.2%) from AB, 50 (15.3%) from BC, 36 (11.0%) from NS and the remaining 50 (15.3%) from MB (20), NL (16) and SK (14).

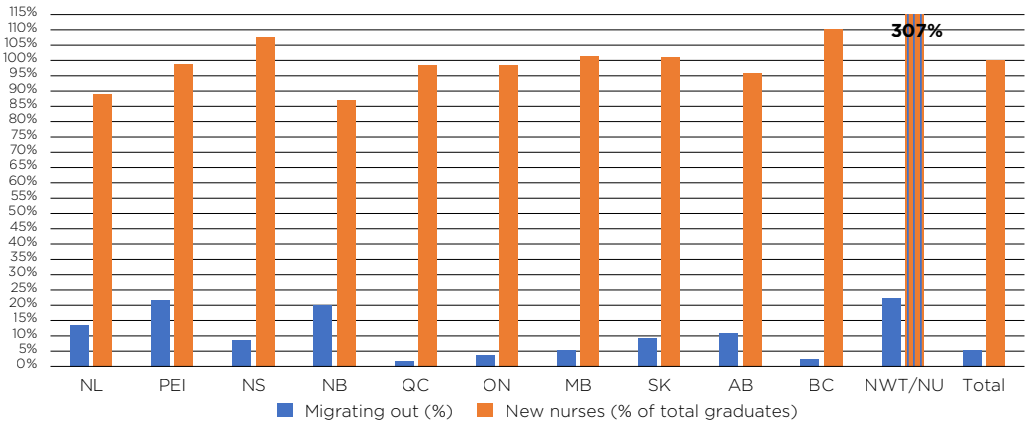
Table 1 can show the source of the NMGs who migrated in any specific jurisdiction but also the destination of the NMGs who migrated out of any specific province. For example, among the 236 NMGs migrating out of AB, 116 (49.1%) moved to BC, 92 (39.0%) to ON and the remaining 28 (11.9%) to NS (11), SK (8), MB (3), QC (2), NB (2), NL (1) and NWT (1).

In the exceptional case of NS, the movement of new graduates from a bigger province to a smaller one is not negligible. This province retains 69 of its FP graduates and receives 71 graduates from other provinces, for a total of 140 new physicians. Of the 71 attracted, it receives 58 from larger provinces (QC, ON, MB, AB and BC) and 13 from a smaller province (NL). Given that NS produced 175 graduates, new physicians represented 80% of its graduates (140/175).

Nurses

Among the 77,055 new nursing graduates in Canada during the five-year period, 28,476 (37.0%) were in ON, followed by QC, 16,532 (21.5%); AB, 10,206 (13.2%); and BC, 9,864 (12.8%). The remaining 11,977 (15.5%) were shared between SK, NS, MB, NL, NB, PEI and the territories, in decreasing order. Figure 3 depicts the interprovincial migration of these nursing graduates, showcasing their rate of migrating out and residing in.

FIGURE 3. Percentage of nursing graduates between 2015 and 2019 migrating out of and residing in Canadian jurisdictions



Source: Authors' calculations based on CIHI (2022a).
Registration data in YT and the NWT/NU include only nurse practitioners and registered nurses. Therefore, the number of regulated nurses migrating to YT or the NWT/NU may be understated.
Data for new nursing graduates migrating out are not available for Yukon.
NWT and NU data are combined.
AB = Alberta; BC = British Columbia; MB = Manitoba; NB = New Brunswick; NL = Newfoundland and Labrador; NS = Nova Scotia; NWT = Northwest Territories; NU = Nunavut; ON = Ontario; PEI = Prince Edward Island; QC = Quebec; SK = Saskatchewan.

At the national level, the nursing migration rate was 5.3%, representing 4,084 nurses. BC and NS were the two provinces with significant positive net migration. The numbers of nurses migrating out/migrating in for BC were 239/1,237, resulting in a net gain of 998 NNGs and a rate of residing in of 110.1% of their total graduates. As for NS, with 2,618 NNGs, the numbers of migrating-out/migrating-in NNGs were 223/427, resulting in a net gain of 204 NNGs and a residing-in rate of 107.8% of their total graduates.

MB and SK also had positive net migration, but marginally. Their rates of NNGs residing in were, respectively, 101.5% and 100.9%. NWT and NU, the two territories for which data are available, had 72 trainees combined but exhibited very strong positive net migration, with numbers of migrating-out/migrating-in NNGs of 16/165, resulting in a net gain of 149 NNGs and a residing-in rate of 306.9% [(72 – 16 + 165)/72]. Like BC, QC and ON were able to retain the highest proportions (≥ 95%) of their NNGs. However, they were not able to attract a share of NNGs as significant as that of BC. QC's share of migrating-in nurses (1.7%) was barely enough to compensate for its rate of migrating-out nurses. As for ON, even though its share of migrating-in nurses (16.5%) was much higher than that of QC, its rate

of migrating-out nurses was more than twice that of QC. For both provinces, this resulted in a slightly negative net migration, with a residing-in rate of around 99%. PEI also had this same residing-in rate, although its migrating-out rate was among the highest, suggesting that it has the capacity to attract NNGs (its share of migrating-in nurses was 2.5%, which is fairly substantial for a small province). A detailed table for nurses, similar to Table 1 for FPs, is available upon request.

The other jurisdictions have significant negative net NNG migration. The net percentage loss was the strongest in NB and NL, with residing-in rates of 87.2% and 89.0%, respectively.

General Discussion and Limitations

General discussion

These results have implications for regional HWP from several aspects, including funding profession-specific training seats in universities in each jurisdiction and profession/jurisdiction-specific policies/programs focused on incentives to stay. The fact that smaller provinces have a lower percentage of medical graduates who remain in the province after graduation could lead these provinces to train more physicians than they required. This phenomenon should not be seen as these smaller provinces subsidizing larger ones but rather as an economically efficient strategy. Medical schools are funded not only by the provincial government but also by the federal government and private and international sources. Out-of-province and international students generated economic activity by paying their tuition and living expenses. Moreover, research in medical schools attracts funding from outside the province and sometimes from foreign countries. So it can be optimal for these smaller provinces to train more physicians than they need.

Still, in terms of interprovincial NMG migration, smaller provinces are disadvantaged. To account for this fact, the federal government could adjust its transfer mechanisms to allocate a proportionally higher share of funding for medical and nursing training seats in these provinces. This is all the more relevant as the Government of Ontario is in the process of removing the registration requirement for out-of-province healthcare workers, specifically physicians and nurses[2] (Cook 2023; Ontario's Regulatory Registry 2023). Schedule 2 under Bill 60 will allow Out-of-Province Regulated Health Professionals to temporarily practise in Ontario without registering with an Ontario regulatory college (Ontario's Regulatory Registry 2023). Although this measure will generate more flexibility and mobility in the labour market for these professionals, it could also mean an acceleration of the imbalance in net interprovincial migration.

Policies and programs focused on incentives to stay could also be considered. Typically, wage or pay increases come to mind when discussing them. Although the level of income is an important factor, the literature shows that other factors, such as working conditions, could be more important. In fact, Mou and Olfert (2015) find that in FPs' intention to move,

higher compensation has a modest effect, whereas community characteristics have a consistently important influence. To attract and retain primary care workers in small provinces or in small communities, policy makers could derive some benefits by seeking to mimic large-community conditions, such as spousal hire programs, assistance for conference travel and support for other means of accessing peers and specialists. These measures would come on top of others, such as group and interprofessional practice and an adequate staff-to-patient ratio, which is generally known to prevent burnout, an excessive workload, excessive on-call duties and a lack of leaves for vacations.

The fact that BC and ON were best able to retain the highest proportion of their NMGs and attract the highest proportion of NMGs from other provinces could be due to different factors in each province, mainly lifestyle for BC and income for ON. The average gross clinical total payment per physician (trimmed at $60,000) was $256,896 in BC and $380,199 in ON in fiscal year 2020–2021 (CIHI 2022b). This suggests that although BC was not able to compete for physicians based on income, it managed to do so on the basis of other factors, including climate, amenities and lifestyle. In QC, the low in-migration may be explained by the official language factor: mostly francophones or bilingual people will migrate to QC. Out-migration from this province is driven by the bilingual neighbouring province (NB) and the fact that medical graduates from the English program at McGill University are more likely to migrate to other provinces – namely, ON. Finally, the territories rely more on nurses to provide care. The finding that NWT/NU has attracted so many nurses is consistent with their model of care. NS and PEI have also attracted many nurses, along with MB and SK. Generally, it seems easier for small or medium jurisdictions to attract nurses than to attract physicians given the migration and distribution pattern of nurses compared to FPs.

The differences among our 13 provincial/territorial fragmented healthcare systems in terms of location, climate, language, size and economy cannot be changed in the short term. The federal government could play a greater role in regulating the competition among provinces and coordinating the healthcare labour force in the country. For example, it can partner with provincial governments in smaller jurisdictions to increase spousal hire programs and mimic large-community conditions. This can be applied to the spouses of either sex. There are growing calls for promoting nurses and nurse practitioners in underserved communities. Yet we found that nurse interprovincial migration is generally less prevalent than that of physicians, although small jurisdictions are less disadvantaged for NNG migration relative to NMG migration. Therefore, for the federal government, this represents a policy lever that is as relevant for the nursing workforce.

Limitations

The data exclude physicians and regulated nurses for whom the province of graduation is unknown. However, this represents a very low percentage among all new graduates and is

virtually nil among Canadian graduates. Moreover, to avoid double-counting at the national level, the SMDB counts physicians once in the jurisdiction of their mailing address. This means that this count does not include physicians who work on temporary arrangements in a particular jurisdiction – for example, locum physicians. They tend to be physicians registered in more than one jurisdiction and accounted for 25.6% of active physicians in 2021. Therefore, the availability of NMGs could be underestimated, particularly for smaller jurisdictions such as the territories and PEI.

The province in which the FP registered to practise in 2021 does not necessarily represent the first province of registration, particularly for someone who graduated at the beginning of the five-year period. Finally, interprovincial migration rates can mask much wider variations in subprovincial movement rates, which are particularly relevant when considering the provision of healthcare services in rural and remote communities.

Conclusion

Relative to regulated nurses, medical trainees are more mobile after their graduation. Moreover, the jurisdiction where they are trained is a key factor in determining their migration rates. For FPs, bigger jurisdictions typically experienced lower out-migration rates than smaller ones while at the same time being able to attract more new graduates. This results in a positive net interprovincial migration rate for NMGs in BC and ON (residing-in new physicians at more than 100% of their total graduates). For QC, although the out-migration rate was not that high (on par with the national average), the migrating-in share was very low, which results in its negative net interprovincial migration rate (residing-in new physicians at 77% of its total graduates). Cultural factors, particularly language, can partly explain this phenomenon.

In the case of nurses, BC and NS experienced significant positive net migration and are marginally joined by MB and SK. On top of better working conditions (group and interprofessional practice, an adequate staff-to-patient ratio, level of income), seeking to mimic large-community conditions (spousal hire programs, assistance for conference travel, support for professional networking) could also help alleviate the net migration imbalance between smaller and larger jurisdictions for both FPs and nurses.

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Notes

1. Some extended FP training programs can take three years instead of the two-year lag used in this analysis. However, that is a rather relatively low figure – 21% of trainees in 2013 (Slade et al. 2016).
2. But also medical laboratory technologists, and respiratory therapists.

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RESEARCH PAPER

Training in Team-Based Practices: A Descriptive Analysis of Family Medicine Postgraduate Site Distribution across Canada

La formation dans les pratiques axées sur le travail d'équipe : une analyse descriptive de la distribution des sites de formation supérieure en médecine familiale au Canada

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Abstract

Background: College of Family Physicians of Canada accreditation policies contemplate exemplary ratings for postgraduate family medicine programs that train residents in sites aligned with the Patient's Medical Home (PMH) vision. This may overrepresent the PMH in training relative to what is available in independent practice.

Methods: We appraised training sites to describe the degree to which PMH features are present in family medicine education across the country.

Results: More than half (70.7%) of Canadian training sites reflect PMH features.
Conclusion: Education policy that incentivizes PMH in training may create downstream tension for physicians who find these practices unavailable upon graduation.

Résumé

Contexte : Les politiques d'agrément du Collège des médecins de famille du Canada prévoient des cotes exemplaires pour les programmes de médecine familiale de cycles supérieurs qui forment les résidents dans des établissements conformes à la vision du Centre de médecine de famille (CMF). Cela peut représenter une surreprésentation du CMF dans la formation par rapport à ce qui est disponible dans la pratique indépendante.
Méthodes : Nous avons évalué les sites de formation afin de décrire dans quelle mesure les caractéristiques du CMF sont présentes dans l'éducation en médecine familiale partout au pays.
Résultats : Plus de la moitié (70,7 %) des sites d'entraînement canadiens reflètent les caractéristiques du CMF.
Conclusion : Les politiques d'éducation qui incitent à adhérer aux pratiques du CMF pourraient créer une tension en aval pour les médecins qui ne rencontrent plus ce type de pratique après l'obtention du diplôme.

Introduction

Primary care is essential for a high-functioning healthcare system (Starfield et al. 2005). However, many in Canada experience challenges accessing comprehensive, continuous primary care (CIHI 2019), with millions of residents reporting that they either do not have a family physician (British Columbia College of Family Physicians 2022; OCFP 2022) or cannot access one in a timely manner (CBC News 2022; Hendry 2022). This crisis of access is expected to grow. At the same time, many family physicians are reporting intolerable rates of burnout and exhaustion (CFPC 2022a, 2022b; Payne 2022) due to the difficulties of building and managing a profitable practice (CFPC 2022b) and the financial and administrative burdens of completing medical forms (O'Toole et al. 2022), coordinating care across multiple health sectors and providers, updating medical records and managing increasingly complex care plans and patients. Accordingly, a growing number of family physicians are closing their practices (CMA 2022) and entering retirement – an exodus exacerbated by the fact that the discipline has become more and more unattractive to medical students and resident learners (CFPC 2022b). A significant portion of family medicine training positions are being left vacant (Frketich 2022; McKeen 2022), and more graduates are choosing not to join comprehensive family medicine practices (CMA 2022). In response, numerous stakeholders, system leaders and scholars have called for federal and provincial leadership and policy that reimagines and improves family medicine practice in Canada, focusing mainly on the need for increased government investment in interprofessional team–based practices (Kiran et al. 2022; McKay et al. 2022) that are supported by remuneration alternatives to fee-for-service

(FFS) payment, such as capitation and salary models (Bazemore et al. 2018; CFPC 2020; CHSRF 2010; Mitra et al. 2021).

These calls resonate with current advocacy for greater uptake of the College of Family Physicians of Canada's (CFPC's) Patient's Medical Home (PMH) vision (CFPC 2019a). The PMH vision is organized into 10 pillars and includes policy recommendations that span remuneration structures to better incentivize continuity-based and community-adaptive family medicine (Mitra et al. 2021) and increased investment in interprofessional healthcare teams that support family physicians in caring for patients across a full scope of services (Khan et al. 2008, 2022; Manns et al. 2012; Strumpf et al. 2017). To date, the recommendations have been moderately realized across the country, with several provinces investing in unique PMH policies that support some practice reform. In Ontario, for example, the government has endorsed Family Health Teams (FHTs), where physicians work with an interdisciplinary team to deliver continuity-based, comprehensive primary care within the community (Glazier et al. 2015). An interdisciplinary team in an FHT can be composed of varying numbers and types of healthcare professionals, including but not limited to nurses, social workers, dietitians, mental health workers, pharmacists, occupational therapists and/or other allied health professionals.

Other models include Family Health Organizations, Family Health Networks and Family Health Groups, which are operated by a group of family physicians who work together to deliver comprehensive care in traditionally underserved areas. These practice models are often associated with a combination of physician remuneration models, spanning FFS, enhanced FFS, capitation, blended capitation, salary and blended-salary models (Aggarwal and Williams 2019; HealthForceOntario 2019). Similar government-backed practice models have been established in several provinces: primary care networks (PCNs) in Alberta (Alberta Health, Primary Health Care 2020; Alberta Health Services n.d.; Leslie et al. 2021; Wranik et al. 2017) and British Columbia (CFPC n.d.a; General Practice Services Committee n.d.), My Health Teams in Manitoba (CFPC n.d.b; Government of Manitoba n.d.), Family Medicine New Brunswick in New Brunswick (Government of New Brunswick 2017; New Brunswick Medical Society 2019) and Groupes de médecine de famille in Quebec (Breton et al. 2011; CFPC n.d.d; Gouvernement du Québec 2022). However, in jurisdictions such as Prince Edward Island (Government of Prince Edward Island 2021), Newfoundland and Labrador (CFPC n.d.c), Nunavut (Department of Health, Government of Nunavut 2018), Saskatchewan (CFPC n.d.e) and Yukon (Government of Yukon 2023), the development of PMH-aligned practices is either in progress or has not yet been developed. In this regard, the widespread adoption and uptake of the PMH model have been elusive and remain incomplete across the country (CFPC 2019b; Katz et al. 2017; Wong et al. 2021).

The current crisis of family medicine access has also become an important consideration for those who develop and enact medical education policy in Canada. Systems of learner selection (Grierson et al. 2017), training and assessment (Asch et al. 2014; Elma et al. 2022),

professional remediation (Tamblyn et al. 2007) and physician certification (Grierson et al. 2021) have all been shown to have a meaningful influence on the effectiveness of healthcare systems. For example, national credentialling programs have been shown to impact the ways in which family physicians organize themselves relative to each other and influence the delivery of comprehensive care at the community level (Correia et al. 2022; Grierson et al. 2021, 2022; Thornton et al. 2022; Tong et al. 2022). In recognizing the influence of education, the CFPC has incentivized the development of PMH practices through accreditation policy that contemplates exemplary ratings for postgraduate family medicine programs that situate residents in clinical training environments embodying the PMH principles (CFPC 2022c).

Notably, however, medical education policies do not always operate in the intended manner. For example, residents and early-career family physicians often describe postgraduate training that is or was situated in interdisciplinary team–based models supported by alternative remuneration structures and a related preference for their independent professional practice to also be situated in these types of models (Grierson et al. 2023). However, given that the available opportunities to practise in such settings upon graduation are currently limited, we know that most will not be able to realize this preference (CFPC 2019b; Katz et al. 2017; Wong et al. 2021). If the CFPC's accreditation incentives have prompted a more rapid and complete development and operationalization of PMH practices within postgraduate training than has been realized in the rest of the country, then early-career family physicians may be faced with few opportunities to work in a healthcare environment that matches the quality of the one in which they trained. As a first step to determining whether this is the case, we set out to describe the characteristics of all the postgraduate family medicine training sites in Canada with respect to whether or not they operated under remuneration alternatives to FFS payment and/or in interprofessional team–based models. This description will set a foundation for understanding the extent to which postgraduate family medicine training is occurring in environments that exhibit key PMH features.

Methods

Study design

This is a cross-sectional descriptive analysis of the team-based and remunerative features of family medicine learning sites across the country.

Data foundations

Administrative data pertaining to the names and location of "clinical" and "administrative" learning sites affiliated with each Canadian family medicine residency program were retrieved from the CFPC. A clinical learning site is defined as "[a] hospital, clinic, or other facility that contributes to residents' educational experiences. There are sites that have both clinical teaching and administrative responsibilities (administrative learning sites) and sites

that are primarily limited to clinical teaching (clinical learning sites)" (CFPC 2022c: 27). These data are collected by the CFPC twice a year (January/February; July/August) from all 17 Canadian postgraduate family medicine training programs. Data were provided to the research team upon request from the CFPC in May 2022. Since clinical learning can occur in both clinical and administrative learning sites (CFPC 2022c), we compiled the sites pertaining to each category into a single data set for coding and analysis.

Data labels

Currently, the PMH model is organized within 10 pillars. In addition to pillars associated with administration and funding and interprofessional teams, the recommendations also include pillars dedicated to practice infrastructure, care connectivity, community adaptiveness and social accountability, accessibility, patient and family partnerships, continuity of care, quality improvement and education and training. Although we recognize the value and contribution of each PMH pillar to family medicine delivery and practice, the current health system calls focus on increased investment in team-based practices (Kiran et al. 2022; McKay et al. 2022) supported by remuneration alternatives to FFS payment (Bazemore et al. 2018; CFPC 2020; CHSRF 2010; Mitra et al. 2021). As such, we focused our appraisal of learning sites on the following two PMH pillars: administration and funding and comprehensive, team-based care with family physician leadership (CFPC 2019a). The administration and funding pillar describes recommendations for remuneration models that support team-based, patient-centred care. The comprehensive team-based care concept involves the delivery of a broad range of services by a multidisciplinary interprofessional healthcare team under the leadership of a family physician who coordinates and integrates all contributions to healthcare delivery.

We coded a learning site as an interdisciplinary team–based practice if it was composed of healthcare professionals from multiple disciplines who collaborate in a formal arrangement to provide primary care to a patient population. The healthcare team could include any combination or number of registered nurses, nurse practitioners, social workers, dietitians, physiotherapists, occupational therapists, pharmacists or other allied health professional provided that it also included family physicians that acted as the most responsible provider for their patient panel (CFPC 2019a). Practices were coded as having an alternative remuneration structure when physician payment was mediated through any mechanism other than FFS (e.g., capitation, salary), including mixtures of FFS with other remuneration structures (i.e., blended).

Coding the training sites

The coding of learning sites began with a comprehensive review of information published on the web pages of provincial and territorial governments, regional health authorities and physician associations concerning the types of primary care models in each jurisdiction (Alberta Health Services n.d.; Alberta Health Services & MyHealth Alberta n.d.; Alberta Primary

Care Networks n.d.; Divisions of Family Practice n.d.; Gouvernement du Québec n.d.; HealthForceOntario 2019; Island Health n.d.; Nova Scotia Health n.d.; Ontario Ministry of Health and Ministry of Long-Term Care n.d.). This review focused on each model's practice characteristics in terms of group composition, practice leadership and remuneration structure. If these published documents indicated explicitly that learning sites within our foundational data set fit into a category of practice models with particular features, then these data were used to code those sites according to our features of interest. Notably, a large portion of learning sites were not explicitly named within the available documents. As such, members of the research team addressed the outstanding coding through review of clinical learning site descriptions that could be extracted from the site's practice web page and/or the family medicine residency program websites. In some instances, the research team completed coding on the basis of discussions with health system leadership representatives of the relevant provincial and territorial health authorities (i.e., the ministries of health), residency training programs and/or medical or clinical leadership representatives of practices who provided information about the features of otherwise unidentifiable training sites.

The coding revealed that a number of training sites are situated in hospitals and focused practices. Hospital-based learning sites were analyzed to determine whether they included an embedded family practice in which residents completed their core family medicine training. If the hospital-based site had a family practice, then it was retained in the data set. However, if the hospital sites did not, then they were accordingly excluded. We corresponded with relevant postgraduate training leaders to confirm that hospital-based learning sites without an embedded family practice reflected locations where residents completed specialty-based rotations and did not receive training in comprehensive primary care. Similarly, training sites associated with focused practices, wherein family physicians specialize exclusively in certain clinical domains (e.g., sports and exercise medicine; addictions medicine), were also excluded.

Data analysis

Once the data were assembled and coded, frequency counts were generated that tabulated how many training sites were represented within each combination of the PMH practice features of interest: interprofessional team–based practice and alternative remuneration structure. We also were able to create counts that describe the total number of training sites that constitute *formal* PMH practices (i.e., endorsed by explicit government policy, such as FHTs and PCNs). This analysis was conducted in August 2022. Data were managed and analyzed on Microsoft Excel version 16 (Microsoft Corp., Redmond, WA).

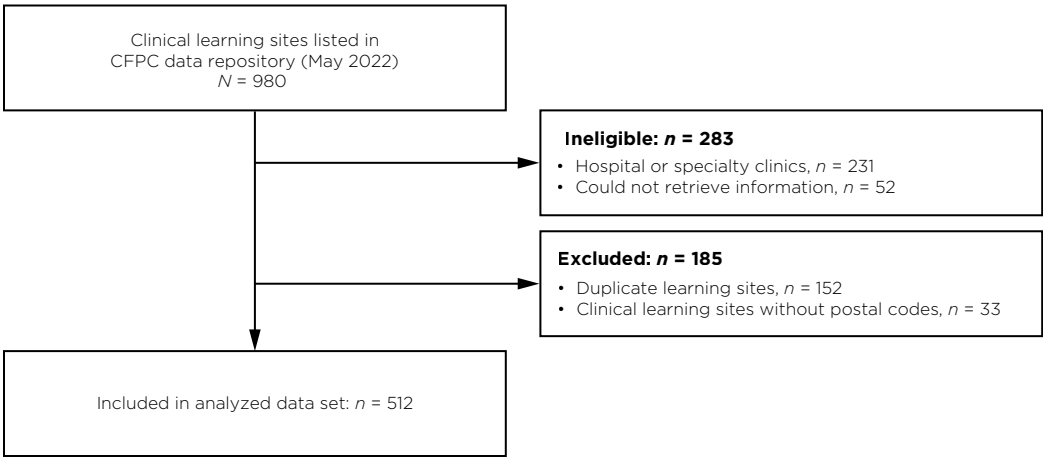
Ethics

This research did not involve human subjects and relied exclusively on analysis of data made readily available by the CFPC, postgraduate training programs and health authorities. Accordingly, it was not submitted for ethical review.

Results

The foundational data set from the CFPC listed 980 learning sites (Figure 1). Following the removal of duplicates, specialty rotation sites, focused practice sites, any learning site that was not associated with a postal code (and therefore of indeterminable location) and sites where we were not able to retrieve any information, 512 learning sites were included in the analysis.

FIGURE 1. Description of the number of family medicine learning sites included in this study



CFPC = College of Family Physicians of Canada.

Jurisdictional distribution of family medicine learning sites

Of the 512 learning sites, 263 were in Ontario (51.4%), 66 in Quebec (12.9%), 56 in Alberta (10.9%), 47 in Manitoba (9.2%), 29 in Newfoundland and Labrador (5.7%), 18 in Saskatchewan (3.5%), 9 in Nova Scotia (1.8%), 9 in New Brunswick (1.8%), 4 in the Northwest Territories (0.8%), 5 in British Columbia (1.0%), 3 in Nunavut (0.5%), 2 in Prince Edward Island (0.4%) and 1 in Yukon (0.2%) (Table 1). The number of sites in British Columbia was notably low as the data provided for this jurisdiction predominantly described hospital sites in which residents complete their hospital-based rotations in other specialties. As per the inclusion and exclusion criteria, these sites were excluded from analysis. The limitations of these data are addressed in the Discussion section.

TABLE 1. Jurisdictional distribution of family medicine learning sites across Canada reported within the May 2022 CFPC data repository

Province or territory	Learning sites		
	Included (*n* = 512) *n* (%)	Excluded (*n* = 468) *n* (%)	Total (*N* = 980) *n* (%)
Alberta	56 (10.9)	6 (1.3)	62 (6.3)
British Columbia	5 (1.0)	59 (12.6)	64 (6.5)
Manitoba	47 (9.2)	143 (30.6)	190 (19.4)
New Brunswick	9 (1.8)	7 (1.5)	16 (1.6)

Province or territory	Learning sites		
	Included (*n* = 512) *n* (%)	Excluded (*n* = 468) *n* (%)	Total (*N* = 980) *n* (%)
Newfoundland and Labrador	29 (5.7)	22 (4.7)	51 (5.2)
Northwest Territories	4 (0.8)	3 (0.6)	7 (0.7)
Nova Scotia	9 (1.8)	11 (2.4)	20 (2.0)
Nunavut	3 (0.6)	3 (0.6)	6 (0.6)
Ontario	263 (51.4)	182 (38.9)	445 (45.4)
Prince Edward Island	2 (0.4)	1 (0.2)	3 (0.3)
Quebec	66 (12.9)	30 (6.4)	96 (9.8)
Saskatchewan	18 (3.5)	1 (0.2)	19 (1.9)
Yukon	1 (0.2)	0 (0)	1 (0.1)

CFPC = College of Family Physicians of Canada.
Sites by jurisdiction are presented with respect to the number included and excluded within the current study.

Practice features of family medicine learning sites

Among the learning sites, 59.2% (*n* = 303) were situated in practices that were formally endorsed by the relevant provincial or territorial government as adhering to the PMH care model. We coded these practices as reflecting both features of interest; however, this does not necessarily mean that they are fully aligned with the PMH model (Table 2). The remaining learning sites were not part of the formally endorsed PMH initiatives; however, many of these sites embodied the two PMH framework tenets of interest. Fifty-nine sites (11.5%) were coded in this manner. Many of the learning sites included one or the other PMH feature of interest. The most common involved alternative remuneration without interprofessional support (87, 17.0%). Sites with interprofessional support but no alternative remuneration structure were less prevalent (28, 5.5%). Notably, less than 7% of the family medicine learning sites did not reflect either of the PMH features of interest (see Table 2).

TABLE 2. Number of clinical learning sites as a function of practice characteristics

Practice characteristics	No. of learning sites (%)
Interprofessional support and alternative remuneration (formal PMH practices)	303 (59.2)
Interprofessional support, family physician leadership, alternative remuneration (informal PMH practices)	59 (11.5)
Alternative remuneration (without interprofessional support)	87 (17.0)
Interprofessional support (without alternative remuneration)	28 (5.5)
No interprofessional support or alternative remuneration	35 (6.8)

PMH = Patient's Medical Home.

Discussion

This study describes the degree to which postgraduate family medicine teaching sites in Canada are organized as family physician-led interprofessional healthcare teams and/or supported by alternative remuneration structures, two recommendations of the PMH vision that have been avowed as crucial mechanisms for ameliorating the current primary care crisis (Bazemore et al. 2018; CFPC 2022c; Kiran et al. 2022; McKay et al. 2022; Mitra et al. 2021). Our findings reveal that clinical family medicine training is predominantly occurring in practices that avow both of these features, with more than half of all training sites in the country situated within PMH practices that have been formally endorsed and supported by the relevant provincial government. That training sites in Canada have a relative overrepresentation of these features may be driven in part by the CFPC's accreditation policy, which considers exemplary ratings for postgraduate family medicine programs that situate resident learners in environments that adhere to the principles of the PMH (CFPC 2019a, 2022c).

In characterizing the features of the training environment of family medicine training, we acknowledge that there is likely significant educational value in training residents in these types of practices. As the current "gold standard" for family medicine practice, these learning environments prepare trainees for the intricacies of collaborative work and the future of continuous, patient-centred, comprehensive family medicine (CFPC 2022c). However, these education experiences may also be problematic insofar as PMH practices are not prevalent and readily available to family physicians after graduation (CFPC 2019b; Katz et al. 2017; Wong et al. 2021). Herein we speculate that the accreditation policy has the potential to exacerbate a meaningful gap between the education residents receive and how family physicians practise post-training. If early-career family physicians are unable to work in practice environments that reflect the nature of their training, then they are likely to feel unprepared for practice (Fowler et al. 2022) and may be prone to reducing their practice scope away from comprehensive, continuous, community-adaptive family medicine (Weidner and Chen 2019). The extent to which this is the case is a topic for future research. From a policy perspective, our findings suggest a challenging dilemma for the accreditation policy makers of postgraduate family medicine education: how to enact aspirational policies that inspire and guide family physicians toward pursuing PMH-aligned practices while also providing them with the appropriate training and skill set that is required for the current realities of community-based family medicine. In the following sections, we offer options for reconciling this conundrum.

Most theories of education emphasize the necessity of exposure to the specific realities of practice to promote the transfer of learning from the training space into the space of criterion performance (Greeno et al. 1993; Grierson et al. 2019; Salomon and Perkins 1989). Taking this perspective leads to the suggestion that accreditation should ensure that residents are trained in the solo or loosely collaborative FFS-style practices that constitute the greatest proportion of family medicine practices in Canada. This would ensure that trainees grow confident and competent within these practice models before beginning their independent

work. Unfortunately, these practice arrangements are central to the current healthcare access crisis, posing time constraints for complex care needs and promoting throughput that favours the quantity of patients over the quality of services provided (Brcic et al. 2012; Glauser 2020). Thus, this suggestion is far from ideal. It is not justifiable to educate learners to be effective in a suboptimal healthcare system when better systems of care delivery are possible.

The more salient and responsible solution to this education-to-practice conundrum is to continue to push for widespread primary care reform (Bazemore et al. 2018; CFPC 2019b, 2020; Kiran et al. 2022; McKay et al. 2022; Mitra et al. 2021). By promoting uptake and implementation of practice environments that align with Canada's superlative clinical training environments, graduating residents will be able to fully apply their acquired competence toward the best health outcomes for our patients and communities. However, as family medicine residents continue to graduate and enter practice every year, we cannot simply wait for governments to invest sufficiently in team-based models with blended remuneration structures. Until this happens, we pose a second option where postgraduate training programs implement thoughtful and meaningful changes to the current curricula. These changes should empower trainees with competence in leadership and health system advocacy so that they might be champions for subsequent primary care health system reform. Our analysis identified training sites that have the PMH features of interest but that are not part of government-sponsored initiatives. Although our work cannot determine the underlying mechanism that enabled these practices to achieve the mentioned PMH principles, it does highlight the fact that achieving such a goal is possible. Residents may be trained in the type of change management and health system thinking that can lead the integration of PMH features into community-based practices (Metusela et al. 2021). Furthermore, curricula could also be diversified such that residents are intentionally exposed to a mixture of practice models, spending time in both solo or loosely collaborative FFS practices as well as physician-led interprofessional team–based practices that are funded via remuneration alternatives to FFS payment. With the curricular expansion toward three-year family medicine residency training in Canada on the horizon (Fowler et al. 2022), we currently have an opportunity to restructure training to equip residents with the competencies needed to navigate the gap between the education and practice landscapes.

There are several limitations in our study. First and foremost, the data on training locations provided by the CFPC reflected self-reports from postgraduate family medicine programs in Canada. Consequently, these data have not been validated for accuracy and may not represent the full or most up-to-date list of training sites in the country. This limitation appears very salient in the cases of Ontario, Manitoba and British Columbia, where a considerable number of sites reported in the data provided by the CFPC were excluded from analysis. In British Columbia, for example, a large majority of the reported training sites were excluded because they were situated in hospitals with no family practices. However, education leaders in British Columbia indicated that training does occur in numerous PMH-style practices within the province but were not able to provide a comprehensive list of locations

or to enumerate the degree to which this occurs. In this respect, we recommend that the CFPC conduct additional comprehensive review and ensure that the training site database is reflective of the most up-to-date changes concerning training opportunities and the national practice landscape. Furthermore, we acknowledge that not all learning sites coded in this study represent the primary locations in which residents complete their family medicine rotations. Therefore, it is possible that some residents spend only a very limited amount of time at some of the learning sites described here. Similarly, our analytic approach does not allow us to determine the number of residents who have trained at these sites. Another limitation in our analysis is that for some cases, we were unable to retrieve information concerning the presence or absence of the PMH features of interest. In these cases, it was assumed that the training site did not have the feature and was coded accordingly. Lastly, there is limited information concerning the number of available PMH-type practices across Canada. This makes it difficult to make a reasonable comparison between the number of PMH practices available during training relative to the full context of practice in Canada.

Conclusion

Family medicine residents are predominantly training in practice environments that align with key features of the PMH model. Although this supports the goals of Canadian family medicine accreditation policy, it also creates a gap between resident training and the realities of the family practice landscape. Postgraduate family medicine training can play an important role in shaping a well-prepared and competent workforce and influencing positive health system change. Medical education leaders should carefully consider the impact of current medical education policies on promoting health system reform and reflect on the opportunities they have to ease the transition from training to practice for new family physicians.

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RESEARCH PAPER

Practice- and System-Based Interventions to Reduce COVID-19 Transmission in Primary Care Settings: A Qualitative Study

Interventions axées sur la pratique et le système pour réduire la transmission de COVID-19 dans les milieux de soins primaires : une étude qualitative

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Abstract

Using qualitative interviews with 68 family physicians (FPs) in Canada, we describe practice- and system-based approaches that were used to mitigate COVID-19 exposure in primary care settings across Canada to ensure the continuation of primary care delivery. Participants described how they applied infection prevention and control procedures (risk assessment, hand hygiene, control of environment, administrative control, personal protective equipment) and relied on centralized services that directed patients with COVID-19 to settings outside of primary care, such as testing centres. The multi-layered approach mitigated the risk of COVID-19 exposure while also conserving resources, preserving capacity and supporting supply chains.

Résumé

À l'aide d'entrevues qualitatives auprès de 68 médecins de famille au Canada, nous décrivons les approches au niveau de la pratique et du système qui ont été utilisées pour atténuer

l'exposition à la COVID-19 dans les milieux de soins primaires partout au Canada afin d'assurer la continuité de la prestation des soins primaires. Les participants ont décrit comment ils ont appliqué les procédures de prévention et de contrôle des infections (évaluation des risques, hygiène des mains, contrôle de l'environnement, contrôle administratif, équipement de protection individuelle) et comment ils comptaient sur des services centralisés qui dirigeaient les patients atteints de la COVID-19 vers d'autres établissements que les soins primaires, comme les centres de dépistage. L'approche à plusieurs niveaux a atténué le risque d'exposition à la COVID-19 tout en ménageant les ressources, en préservant les capacités et en soutenant les chaînes d'approvisionnement.

Introduction

As the often first point of contact in the healthcare system for infected individuals during disease outbreaks, family physicians (FPs) must deal with new diseases when there is little information about the nature of the disease and how it spreads (Hogg et al. 2006; Westfall et al. 2021). Moreover, FPs play a key role in infectious disease surveillance, alerting public health officials about unusual disease activity in the community. During the early stages of the COVID-19 pandemic in 2020, efforts to enhance infection prevention and control (IPAC) (Table 1) in primary care settings were hindered by various factors, including shortages of personal protective equipment (PPE) across Canada and internationally (Hoernke et al. 2021; Houghton et al. 2020; Kea at al. 2021; Shah et al. 2020; Snowdon and Forest 2021; Snowdon and Saunders 2021; Snowdon et al. 2021; Wanat et al. 2021). In addition to increasing IPAC, pandemic preparedness plans in Canada recommend diverting patients away from family practices through the use of telephone advice and assessment lines, centralized testing and assessment centres, alternate treatment sites for infected individuals and fee codes for virtual (telephone or video) visits (Government of Canada 2018; Ontario Ministry of Health 2019; Ontario Ministry of Health and Long-Term Care 2013).

TABLE 1. Summary of IPAC elements

IPAC element	Example IPAC practices to limit spread of COVID-19 in primary care
Risk assessment	Screening patients prior to and upon arrival at a family practice
Hand hygiene	Routine cleaning of hands before and after interaction with patients or high-risk materials
Control of environment	Routine cleaning; cleaning for repurposing equipment surfaces and rooms; changing the layout of a practice to allow for physical distancing; placement of protective barriers; creation of segregated spaces for high-risk activities and/or patients; disposal of sharps and contaminated materials; changes to heating ventilation and air conditioning
Administrative controls	Staff education; healthy workplace policies; audit of IPAC practices
PPE	Access to supplies of appropriate PPE

Sources: Ontario Agency for Health Protection and Promotion and Provincial Infectious Diseases Advisory Committee (2012, 2015).
IPAC = infection protection and control; PPE = personal protective equipment.

FPs must manage conflicting priorities during a pandemic; they must limit potential exposure of the infectious disease to other patients, staff and themselves while at the same time ensuring that routine care remains available (Government of Canada 2018). Statistics from severe acute respiratory syndrome (SARS) and COVID-19 illustrate the risks: in 2003, several FPs contracted SARS from patients, and one FP died (Government of Canada 2003). In 2020, the first year of the pandemic, 171 FPs (of the 16,990 FPs in Ontario [CIHI 2021]) tested positive for COVID-19, representing 47.8% of all physicians who tested positive for COVID-19 (Liu et al. 2022). The COVID-19 pandemic was the first instance when system-wide measures were implemented to address these conflicting priorities. Provinces across Canada used different system-based interventions to minimize the risk of spreading COVID-19 in primary care settings. Regional variations in practice- and system-based approaches provide rich data on the pandemic response in primary care. Using a multiple-case study of four regions in Canada, we examined FPs' experiences in adapting office-based IPAC procedures and their perceptions of system-based interventions to divert potentially infectious patients away from family practices. The study provides evidence with which to evaluate pandemic response, specifically with respect to IPAC interventions, during the COVID-19 pandemic and improve planning for future pandemics as well as periods of high levels of circulating disease, such as seasonal influenza. Identifying measures shown to be acceptable and effective to providers are needed to safeguard the health and well-being of both providers and patients while ensuring that essential services remain available to patients during health emergencies.

Methodology

As described in our published protocol (Mathews et al. 2021), using a multiple-case study design (Yin 2014), we conducted semi-structured qualitative interviews with FPs and used a document review to create a chronology of the pandemic response related to primary care in four regions: the Vancouver Coastal Health region in British Columbia (BC), the Eastern Health region of Newfoundland and Labrador (NL), the province of Nova Scotia (NS) and the Ontario (ON) Health West region.

We recruited FPs from October 2020 to June 2021 using maximum variation sampling (Creswell 2014) along a wide range of characteristics until we reached saturation (Berg 1995; Creswell 2014). We included FPs who were licensed to practise in 2020. Participants could work in different primary care settings, including long-term care facilities and hospitals. We excluded postgraduate medical trainees and FPs on temporary licences or in exclusively academic, research or administrative roles. In each region, research assistants e-mailed study invitations to FPs identified from lists of academic faculty and physicians with hospital privileges, as well as the public physician search portals of provincial medical regulators. We also posted recruitment notices in medical organizations' newsletters and social media posts and, where permitted by local ethical boards, used snowball sampling.

The research assistants who sent out study invitations (LMe, LMo, RB, SS) and one investigator (MM) conducted interviews. In each interview, we asked FPs to describe the various pandemic-related roles they performed over different stages of the pandemic and the facilitators and barriers they experienced in performing these roles, as well as other potential roles that FPs could have filled. We conducted interviews by Zoom (Zoom Video Communications Inc.) or telephone depending on participant preference. We audio-recorded interviews, which we then transcribed verbatim, and also included interviewer field notes in the analysis.

Using a thematic analysis approach, at least two members of the research team in each region read two to three transcripts independently to identify key words and codes, which were organized into a preliminary coding scheme (Berg 1995; Creswell 2014). To create a uniform coding template across the four regions, each regional team coded a set of four transcripts (one from each region) using their own coding template and then met to compare coding, refine the meaning of each code and develop a unified template with consistent code labels and descriptions. The regional teams used the unified coding template to code all transcripts and field notes for their respective regions using NVivo 12 (QSR International). We summarized participant demographic and practice data using descriptive statistics.

To ensure the rigour of our analyses (Berg 1995; Creswell 2014; Guest 2012), we pretested interview questions, documented procedures, used experienced interviewers and verified meaning with the participants during interviews, looked for negative cases and provided context to situate illustrative quotations. Furthermore, our interdisciplinary team included FPs and public health experts, allowing us to draw on previous expert knowledge in the development of our interview guide and the interpretation of our results (Yin 2014).

We compiled publicly available documents dating back to/published in March 2020 onward in each region to record primary care-related aspects of the pandemic response through a combination of targeted and general search strategies, including a review of grey literature. In each region, we documented the interventions to divert patients away from family practices and verified our list of interventions with public health officials, FPs and primary care researchers to ensure completeness and accuracy.

We obtained approval from the research ethics boards at all participating institutions. Participants provided informed consent before interviews were scheduled. To reduce the risk of a privacy breach and to maintain confidentiality, we used passwords for electronic files, including recordings, concealed identifying information during the transcription process and identified participants by study numbers.

Positionality

We are an interdisciplinary team of primary care researchers with training in health administration, epidemiology, social work, anthropology, nursing and family medicine. Co-authors include FPs directly involved in pandemic response, including those in leadership positions.

Through the discussion of node reports and review of article drafts, we reached a description and interpretation of findings that balanced our individual views and reflected the data (quotations and policy documents). Our broader research team includes FPs, public health officials, health system administrators and policy makers who confirmed that the findings reflected their own experiences.

Results

We interviewed a total of 68 FPs across the four regions (BC = 15; ON = 20; NS = 21; NL = 12). Study participants were composed of 41 women and 27 men, 22 FPs paid by fee-for-service, 49 FPs with hospital privileges and 20 FPs who practised exclusively in rural settings (Table 2). All FPs in the sample described steps taken to limit exposure to COVID-19 in their practices. We used the five elements of IPAC (see Table 1) to organize and label these steps. The five elements are outlined in practice management guidelines and IPAC manuals available to community-based physicians in Canada.

TABLE 2. Characteristics of study participants

Characteristics of study participants (*N* = 68)	*n* (%)
Province	
British Columbia	15 (22.1)
Ontario	20 (29.4)
Nova Scotia	21 (30.9)
Newfoundland and Labrador	12 (17.6)
Gender[a]	
Men	27 (39.7)
Women	41 (60.3)
Remuneration model	
Fee-for-service	22 (32.4)
Alternative payment plan[b]	46 (67.6)
Academic/hospital affiliation	
No	18 (26.5)
Yes	49 (73.5)
Community size[c]	
Rural	20 (29.4)
Small urban	1 (1.5)
Urban	44 (64.7)
Mix[d]	3 (4.4)
Years in practice (mean [standard deviation])	16.9 (9.72)

a Gender was asked as an open-ended question.
b Alternate payment includes all non-fee-for-service or enhanced fee-for-service payment types.
c Rural < 10,000 population; small urban = 10,000–99,999 population; urban > 100,0000 population.
d Participants had more than one practice location, which were located in both urban and rural settings.

Participants described the context in which they implemented IPAC, how they implemented the five elements of IPAC in their practices and their perceptions of system-based interventions that diverted potentially infectious patients away from primary care practices.

Context of IPAC in Primary Care Practices during the COVID-19 Pandemic

Participants felt that they received little guidance from provincial public health authorities at the onset of the pandemic (March 2020) in terms of reorganizing their practices to safely see patients:

> There was no true guidance, really, at that time … in terms of how to manage our family practices. We just honestly took it upon ourselves … to [create] a patient flow care plan on how to manage … the incoming calls, to triaging, to who do we bring in? You know, if they have infectious symptoms, what do we do? (ON07)

Additionally, participants felt that much of the initial guidance was not directly applicable to primary care settings:

> I think people in general practice felt not as guided by the health authority as other parts of the health system. … [T]here was no guidance about how should I redesign my waiting room if I'm in a general practice office … . They did build processes for sharing that information and guidance over time, but it was pretty bumpy at the start; the first few weeks were pretty sketchy on the primary care side. (NS01)

In the first months of the pandemic, FPs initially based IPAC procedures on their own understanding of COVID-19 derived from journal and media articles and, once it became available (fall 2020), official guidance from public health or regional authorities.

Implementing IPAC

RISK ASSESSMENT

Participants described screening patients after hearing public health advisories in January 2020 about patients with influenza-like symptoms who had recently travelled to China ("[With regard to] the screening questions, [w]e made our own initially. … [O]nce they started publishing … screening questions, we used those" [NS15]) and adopted more formal sets of questions as symptoms became better known over the course of the first year of the pandemic ("I looked at the Public Health website to see what screening questions or symptoms they use" [BC08]). Screening took place in many forms – through signage, in-person questioning and e-mails prior to appointments: "So, like many other clinics, [we were] calling patients – first of all, we have a big list of questions that we asked them" (ON17).

HAND HYGIENE

Although participants made few explicit references to handwashing, many noted the need to restock hand sanitizers ("[W]e ran out of … hand sanitizer" [BC13]) and to direct staff and patients to sanitize their hands upon entering the office ("We put a table right in front … with hand sanitizer and little signs on it" [NS15]).

ENVIRONMENT CONTROLS

Participants changed the physical layout of their practices to limit the number of patients in the office at one time by reducing waiting room capacity ("[W]e emptied the waiting room of chairs" [ON13]) and instructing patients to wait in their cars until their appointment ("[P]atients would call from their car when they arrived and they would wait in their car, and they wouldn't come in until it was time for their appointment" [NS15]). Participants also made changes to the scheduling of appointments to limit the number of patients in the office: "The biggest challenge was navigating who comes in the office and when, how many patients can we book at a time to ensure the waiting room isn't full of people and we can safely socially distance" (NS22). They also scheduled patients with COVID-19 "as a last patient of the day" (NS12) to minimize the risk that this could present to others.

Participants also instituted more frequent and intensive cleaning protocols: "[W]e now have all kinds of procedures about wiping down rooms and things after we see a patient" (NS02). Participants' practices also erected protective physical barriers between patients and reception staff to reduce potential contact with patients: "[We had l]ots of Plexiglas for the … receptionist stations" (ON17).

Participants designated areas of their clinics for specific purposes: "[C]ertain rooms are phone rooms and certain rooms are patient rooms. And so that allows us to make sure that certain rooms are kept clean or we know where the patients are going" (NS05). Patients who presented with influenza-like illnesses were seen in separate areas of the clinic in order to reduce the risk to others: "[We] segregated part of our clinic so that there [were] a couple [of] rooms in the back of the clinic that were designated just for people with respiratory symptoms, and we had special cleaning protocols in place for those rooms in particular" (ON02). In some cases, these patients were seen outdoors: "[I]f people had symptoms, … we were examining them outside if possible" (ON08).

ADMINISTRATIVE CONTROLS

As described above, FPs developed an understanding of IPAC from journal and media articles, social media and official guidance from public health or regional authorities. Participants noted that much of the responsibility for screening patients was taken on by administrative and nursing staff and that screening guidelines changed frequently. Participants described the challenges in educating staff to ensure that they were following up-to-date protocols: "So every time the government came out with another screening

questionnaire, we would update our staff" (ON13). They also followed healthy workplace policies such as encouraging staff to be vaccinated: "[M]ost of us are vaccinated fully" (NS16). Technological supports, such as remotely accessed electronic medical records (EMRs), facilitated working remotely: "[W]e had a skeleton staff in the clinic, but with the EMR we were able to have all of our staff either working remotely or in the clinic" (BC07).

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Even within the same region, access to PPE was an issue for some practices ("[W]e needed PPE" [NS10]) but not for others ("[W]e had PPE from the hospital right away" [NS05]). PPE needs changed over the course of the pandemic as more information about the transmission of the virus was known:

> At the beginning, we wore gowns into every patient appointment. … [O]nce we found out that the virus itself doesn't really last that long on surface objects, I think things really relaxed by June [2020]. … [I]t was very unclear as to what is the right PPE in a primary care setting. (ON09)

The availability of appropriate PPE determined which patients were seen and which services FPs provided in person: "If your patient is screening positive, which many of ours did, and we didn't have PPE, … we have no option but to send them to [the emergency department (ED)] because … we can't go out to see these patients if we're putting ourselves at risk" (NS10).

Diverting Potentially Infectious Patients Away from Family Practices

Although the implementation of practice-based IPAC procedures was similar across the case study sites, the provinces represented by the case study sites used different system-based interventions to divert symptomatic individuals away from community-based family practices (Table 3). Centralized assessment centres, telephone advice lines and virtual fee codes were in place for extended periods, whereas influenza-like illness clinics were available for limited periods.

ASSESSMENT CENTRES

All provinces had centralized COVID-19 assessment and testing centres, so FPs were not required to test patients in their practices. Over the course of the pandemic, BC and ON implemented online symptom screening tools that determined whether a patient was eligible for COVID-19 testing; in NL (and for a limited period in NS), patients had to be referred for testing by the 811 HealthLine. Generally, assessment and testing centres were positively viewed by FPs because they allowed practices to conserve PPE and reduce the risk of transmission ("[W]e would have had to use the additional PPE for [screening and testing patients], and if you had symptomatic people coming in to your office, then it would have put other

TABLE 3. System-based approaches to minimize contact with symptomatic individuals in primary care settings

	Vancouver Coastal Health, BC	Ontario Health West region, ON	Province of NS	Eastern Health region, NL
Assessment and testing centres[a]	x	x	x	x
Telephone advice lines[b]	x		x	x
Telephone assessment lines[c]			x[d]	x
Influenza-like illness clinics[e]			x	x
Virtual care fee codes[f]	x	x	x	x

a Bengston (2020); Eastern Health (2021); Government of Ontario (2022); Nova Scotia Health Authority (2020).
b Government of British Columbia (2022); Government of Newfoundland and Labrador (2022); Province of Nova Scotia (2022).
c Government of Newfoundland and Labrador (2022); Province of Nova Scotia (2020).
d For a limited period of time, early in the pandemic.
e Eastern Health (2021); Nova Scotia Health Authority (2020).
f BC Family Doctors (2020); Claims Services Branch, Ontario Health Insurance Plan Division (2020); Government of Newfoundland and Labrador (2020); Nova Scotia Medical Services Insurance (2020).
BC = British Columbia; NL = Newfoundland and Labrador; NS = Nova Scotia; ON = Ontario.

asymptomatic people at risk" [ON10]) and because they allowed family practices to operate with minimal disruptions ("[I]t was very helpful to be able to send [patients] to a testing centre. It helped us to maintain flow and access to us for all the rest of our patients" [BC01]). Moreover, in most (but not all) cases, FPs were notified if their patients tested positive ("[I]f a patient gets tested, their results will go back to their primary care physician" [NL01]), allowing FPs to follow up on patients.

The criticism of centralized testing was related to patients receiving conflicting advice from their physician: "[T]the criticism of directing patients to assessment centres – the rules [around when to send them to be assessed] were vague and they changed, … which made it hard for us to figure out how to properly advocate for our patients" (ON15). Participants who worked with populations that struggle with navigating the health system believed that centralized testing centres posed additional barriers for their patients. For example, an FP who worked at an addiction clinic suggested:

> I felt that we should offer testing, at the addiction clinic in particular, because a lot of the patients there … often don't follow through. It's very difficult to get them to follow through for bloodwork or other kinds of tests. … Most of the people there … would probably have difficulty navigating the system to get tested. (BC05)

Similarly, another FP noted that the presence of police at some of these centres (in the initial months of the pandemic in 2020) may have discouraged undocumented migrants from getting tested: "[T]he assessment centres were difficult to access initially, [and] the police would be triaging people … . And so, for obvious reasons, many people, … especially in the precarious migrant community, were definitely not going to go there" (BC15).

TELEPHONE ADVICE AND ASSESSMENT LINES

Three provinces (BC, NS and NL) used telephone advice lines (known as 811 lines). In BC and NS, the 811 service provided COVID-19 information and advised patients if their symptoms met the testing criteria but did not arrange appointments for testing (except for an initial limited period in NS). A participant in NS felt that the 811 service alleviated the pressure on their office staff: "The 811 line … having that for patients with COVID questions, that was a huge support. Because it takes volume off of the front desk staff … . [The staff] could just say, … 'call 811'" (NS21). Participants in BC felt that the telephone service contributed to patients having consistent information: "So, I know [the province] set up a … 1-800 line or 811 line, and I think that's good, you know, it gives centralized information" (BC10).

In NL (and for a limited period in 2020 in NS), the telephone intervention further included assessment (i.e., eligible patients could schedule a screening appointment). FPs were instructed to direct patients with COVID-like symptoms to the 811 line to determine whether patients met the criteria for a COVID-19 test. The 811 operators also scheduled appointments for testing: "There was one avenue and only one avenue for patients that were presenting with symptoms and that was to go through … 811" (NL02). Participants in NL felt that the 811 service created barriers to COVID testing: "[I]t was a real bottleneck in terms of getting through 811" (NL03). Moreover, FPs said that advice received from 811 would sometimes contradict the physician's advice: "[A] patient would have symptoms and we'd direct them to 811 … and then they get screened at 811 and 811 wouldn't test" [NL04]. The mixed messages left both patients and FPs confused:

> The major obstacle or dilemma was the mixed messages that patients were getting … when they were calling 811 … . [S]ome of them were being told to isolate, some of them were being told to see their family physician, some of them were being told that they needed to be swabbed, some of them were being told that they didn't need to be swabbed. … And basically … there wasn't a whole lot of difference in the presentation. (NL01)

INFLUENZA-LIKE ILLNESS CLINICS

NS and NL experimented with dedicated clinics for patients with influenza-like illnesses:

> We set [clinics] up so that people with flu-like illness … didn't necessarily need to go into their family doctor's office. They could go to this other, stand-alone clinic … to make sure that the family doctors could continue on with their regular business in their offices without fears of themselves or their patients contracting illness. (NS13)

These clinics had the goals of helping to preserve PPE, reducing exposure at family practices and limiting the use of emergency departments for non-acute patients: "[With regard to]

patients …[with] cough and the fevers, a lot of the family medicine offices do not open their doors and are not willing to see them and then they end up in [the ED] by default, when they are nowhere near sick enough to be in [the ED]" (NS02). These clinics operated only when there was a high number of cases of influenza-like illness.

VIRTUAL CARE

All regions in our study adopted fee codes to facilitate virtual care visits, which allowed FPs to screen patients for COVID-19 and only see patients in the office if they required care: "[W]e were booking phone call appointments first, virtual visits first. And then if we felt that the patient needed to be seen in office, our nurse would sort of triage the case quickly and then just book them into an in-house appointment almost immediately" (ON07).

Discussion

We described practice- and system-based approaches used in four regions in Canada to mitigate the risk of COVID-19 in primary care settings. Many FPs in Canada and elsewhere felt poorly guided by public health and IPAC guidelines that largely focused on acute care settings (Hoernke et al. 2021; Houghton et al. 2020; Khunti et al. 2020; Mathews et al. 2022, 2023b) and worked to tailor these guidelines to suit primary care settings. FPs who participated in our study demonstrated their ability to enact all five IPAC elements in their practices (see Table 1), despite PPE shortages. FPs used environmental and administrative controls to minimize patient contact by redirecting patient flows, reorganizing workspaces, enhancing cleaning protocols and working remotely (Houghton et al. 2020; Khunti et al. 2020).

The implementation of practice- and system-level interventions to mitigate the risk of exposure to pandemic-causing illnesses in primary care settings requires planning during the interpandemic period and system-wide, coordinated enactment of interconnected exhortation, expenditure and public ownership (Deber 2018) policies by government and professional, public health and healthcare organizations during the early stages of a pandemic. To support practice-based interventions, exhortation policies (e.g., IPAC guidelines tailored to primary care settings) and expenditure policies (e.g., fee codes to support virtual care, PPE subsidies) are needed. System-level interventions require exhortation policies (e.g., information for providers and the public), expenditure policies (e.g., billing codes for work in testing, assessment of influenza-like illness clinics) and public ownership (e.g., centralized PPE distribution warehouses, testing and assessment centres, information and screening telephone lines and influenza-like illness clinics).

Practice-level protocols were buttressed by system-wide interventions that diverted high-risk patients from family practices and enabled primary care providers to deliver care virtually and to work remotely. Together, the multi-layered approach mitigated the risk of COVID-19 exposure while also helping to conserve scarce resources (e.g., PPE, testing kits) (Hoernke et al. 2021; Snowdon and Saunders 2021), preserve ED capacity, support fragile

supply chains (Snowdon and Saunders 2021) and allow FPs to continue delivering routine primary care (Glazier et al. 2021; van der Velden et al. 2021).

Centralized testing centres for the general population were closed after nearly two years of operations in early 2022. In contrast, practice-level approaches (such as screening and masking) have continued throughout the pandemic, even after PPE became more easily available. Changes in the availability of centralized services need to be communicated in advance so that primary care providers can advise patients and make practice-based accommodations (Mathews et al. 2022).

FPs viewed centralized services positively when they facilitated the operation of family practices, enabled them to conserve PPE and promoted continuity of care but were critical of centralized services if they delivered mixed messages or conflicting advice or created barriers to access. These findings suggest the need to balance centralized and tailored approaches to reach populations facing intersecting vulnerabilities (Embrett et al. 2022; Gagnon-Dufresne et al. 2022; Seto et al. 2020; Spencer et al. 2022).

Our study contributes evidence with which to evaluate the pandemic response and improve planning for future pandemics. Future research should evaluate the impact of influenza-like illness clinics and mass assessment and testing centres on the transmission of COVID-19 to FPs and the utilization of EDs by patients with respiratory symptoms. Moreover, the study highlights the need to provide clear guidelines and educate FPs about IPAC tailored to primary care settings (Young et al. 2023), to include primary care providers in the allocation and distribution of PPE (Mathews et al. 2023a) and to develop communication plans to engage and communicate with primary care providers (Mathews et al. 2022; Young et al. 2023) during rapidly evolving health crises.

Limitations

We conducted interviews between October 2020 and June 2021 and examined four regions. The study data may not reflect experiences during later stages of the pandemic or in other regions. Additionally, interview data may be subject to social desirability (Bergen and Labonté 2020) and recall bias (Coughlin 1990).

Conclusion

Practice- and system-based approaches were used in four regions in Canada to mitigate the risk of COVID-19 exposure in primary care settings. Participants believed that the use of centralized assessment centres, telephone advice lines and virtual fee codes, in combination with practice-based IPAC procedures, worked well to divert potentially infectious patients from primary care practices and preserve the ability to deliver care. The use of a multi-pronged, multi-layered approach was believed to reduce the risk of COVID-19 exposure while also conserving resources, preserving health system capacity and supporting stressed supply chains.

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