HEALTHCARE

POLICY

Politiques de Santé

Health Services, Management and Policy Research
Services de santé, gestion et recherche de politique

Volume 16 ◆ Number 4

The Shadow Pandemic of Alcohol Use during COVID-19: A Canadian Health Leadership Imperative

ELIZABETH HARTNEY

Describing the Mental Health State of Nurses in British Columbia: A Province-Wide Survey Study

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Politiques de Santé

Health Services, Management and Policy Research
Services de santé, gestion et recherche de politique

VOLUME 16 NUMBER 4 • MAY 2021

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.

While *Healthcare Policy/Politiques de Santé* encourages submissions that are theoretically grounded and methodologically innovative, we emphasize applied research rather than theoretical work and methods development. The journal maintains a distinctly Canadian flavour by focusing on Canadian health services and policy issues. We also publish research and analysis involving international comparisons or set in other jurisdictions that are relevant to the Canadian context.

* * *

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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Healthcare Policy/Politiques de Santé is published four times per year by Longwoods Publishing Corp., 260 Adelaide St. East, No. 8, Toronto, ON M5A 1N1, Canada. Manuscripts are reviewed by the editors and a panel of peers appointed by the editors.

Healthcare Policy/Politiques de Santé is indexed in the following: PubMed/Medline, CINAHL, CSA (Cambridge), Ulrich's, Embase, IndexCopernicus, Scopus, ProQuest, EBSCO Discovery Service, is archived in PubMed Central, and is a partner of HINARI.

ISSN No. 1715-6572
eISSN No. 1715-6580

Publications Mail Agreement No. 40069375

EDITORIAL

COVID-19 and a Window into Healthcare Providers' Resiliency

As contemporaneous data emerge from publicly funded healthcare providers, the COVID-19 pandemic provides a unique opportunity to measure their resiliency. Resiliency matters because it connotes a higher level of confidence in being able to provide needed healthcare during times of health, social or environmental stress or calamity. At the beginning of the first wave of the COVID-19 pandemic in early 2020, there were warnings regarding hospitals' ability to successfully manage large surges of critically ill COVID-19 patients who were expected to soon be presenting at hospitals in every province and territory. Shortly thereafter, hospitals implemented policies to clear hospital beds – there were public reports that hospitals rapidly went from nearly full occupancy to below 50% (CIHI 2020a; Howlett 2020; Zeidler 2020).

The fact that hospitals were able to free thousands of their beds so quickly was a remarkable metamorphosis. As recently as 2019, hospital occupancy in Ontario was often above 95% and grappling with seemingly immovable patients waiting for other settings of care (Bender and Holyoke 2018; Government of Ontario 2019).

Measuring Hospital Resiliency

Clearing hospital beds and quickly transitioning many patients to other care settings provided evidence that hospitals, in conjunction with their community's other health and social care providers, had adaptive resilience (Thomas et al. 2013). This is a valuable attribute that indicates that hospitals are able to absorb health-related disasters while continuing to provide critical healthcare to their communities.

But clearing hospitals came at what cost? There is no evidence yet from provinces or territories that moving patients from hospitals earlier than planned caused detectable increases in premature mortality or excess morbidity. Perhaps this evidence will emerge; though if it does not, and if these gains in hospital efficiency can be maintained without jeopardizing patient outcomes, it would show the hospitals' ability to quickly build new and effective processes of care.

Yet, the financial resilience of hospitals is still very murky. In the short term, the majority of hospitals' funding comes from global budgets, and they should have no problem meeting their fixed costs since they have very little wiggle room to reduce spending. In the medium term, provincial and territorial governments will reckon with fewer patients having had access to elective treatments while surgical wait lists continued to expand. In British Columbia, for example, the policy response was to commit hundreds of millions of new spending to increase surgical capacity (Government of British Columbia 2020). In the longer term, governments' intentions to bankroll expanded capacity are unclear, and the consequences may be some combination of financial insecurity for hospitals and their skilled staff, erosion of services or longer waits for non-life-threatening care.

Resiliency in Other Sectors

Perhaps the cost of clearing hospitals was borne by long-term care? While this public health emergency has shown some evidence of resilience among hospitals, the same cannot be said for long-term care. A confluence of resident, staff, care home, health system and social care factors contributed to, in some instances, disastrous outcomes for residents of long-term care, their families and the staff (Holroyd-Leduc and Laupacis 2020). It will take years to unpack the impact of the lack of resiliency in long-term care and repair the gaps that COVID-19 revealed (Armstrong et al. 2020; Webster 2021).

Some statistical evidence shows that privately provided physician care demonstrated adaptive resilience, with over 50% of care being provided virtually within a few months of the onset of the pandemic (CIHI 2020b). Maintaining these transformative changes in the delivery of physician care may particularly benefit those residing in rural or remote areas and for whom travel is expensive and inconvenient.

Beyond long-term care and physician care, clear indicators of resilience from other sectors are yet to emerge. Nursing homes and home care similarly grappled with an influx of patients discharged from hospitals earlier than usual. Because these sectors are financed by a mix of private and public funds, their financial resilience is particularly important for maintaining stability in capacity for healthcare provided in the community.

Monitoring Resilience for the Future

The unfolding saga of the COVID-19 pandemic and the stressors that it induced upon the provinces' and territories' healthcare providers have shown some strengths and weaknesses of the regions' health and social care systems.

It is highly desirable for provinces and territories to have resilient healthcare providers who will continue to deliver healthcare irrespective of the challenges of future large-scale disasters. Health system resiliency matters because we want to avoid unnecessary suffering and premature death.

The features of provinces' and territories' resiliency will include the ability to adapt to new challenges, such as the COVID-19 pandemic; transform practices to incorporate new technologies; and remain solvent. With these points in mind, provinces and territories should develop a process for monitoring and investing in strengthening the resilience of all healthcare sectors on an ongoing basis.

This Issue of *Healthcare Policy*

This issue of *Healthcare Policy* is led by a discussion and debate article, which engages the reader to consider the short- and longer-term health and social consequences of higher levels of alcohol consumption induced by the COVID-19 pandemic (Hartney 2021). Concerningly, the author notes that due to provincial infection-control policies and social distancing recommendations from public health offices, access to healthcare and social services for overconsumption may be commensurately less accessible during this time of heightened need. The article calls for federal and provincial governments to enact policies to enhance access to prevention programs designed to lessen alcohol overuse, especially among high-risk groups, in order to mitigate future health and social harms.

The discussion and debate article is followed by a rejoinder, whose authors jointly focus on provinces' policies to loosen controls that increase the availability of alcohol during the pandemic (Lange and Rehm 2021). The authors reinforce the associations between boredom, stress and convenience with alcohol overuse. The rejoinder extends the discussion of pandemic-related alcohol overuse by calling for provinces to reduce the availability of alcohol and for enhanced screening and interventions to target alcohol overuse.

Research Papers

This issue's first research paper focuses on the prevalence of mental health problems among nurses in British Columbia (Havaei et al. 2021). Referencing complex and intertwined work-related risk factors, the paper states that elevated levels of depression, anxiety and other mental health problems have been associated with absenteeism, nurses' feelings of reduced personal accomplishment and emotional overextension and exhaustion. Applying a cross-sectional survey design, the authors found excess mental health problems among nurses and recommend confidential assessment of nurses' mental health and structural changes in their workflow in order to address the causal factors that lead to mental health problems.

Next, a team of authors conducted a scoping review of patients' preferences for healthcare among those with specific health conditions (Peckham et al. 2021). Citing reforms to align healthcare and improve patient-centredness, the authors undertook an extensive review of the literature to identify and measure the needs, desires and preferences of patients. The review found five themes of preferences across a number of health states: personalized care, information, choice, holistic care and coordinated/continuity of care. This study has policy implications relevant to determining who should be a part of the care team, how to effectively engage with patients of differing health states and how to design healthcare improvement initiatives that align with the preferences of patients.

Targeting overcrowding and extended waits in hospitals' emergency departments, the next paper reports on the findings of a quantitative analysis of emergency department lengths of stays in a sample of urban regions' hospitals in western Canada (Kreindler et al. 2021). Anchored with cross-sectional data from the National Ambulatory Care Reporting System, the extensive modeling found no clear evidence of high or low performers. The authors conclude that to relieve the pressure on emergency departments, policies to support new models of ambulatory care are needed, including those that reflect local needs and their community's capacity.

In the context of language proficiency and inadequate patient–provider communication, the next paper analyzes two data sets to measure concordance between physicians' and patients' use of non-official languages in a sample of the largest urban areas of Canada (Ariste and Matteo 2021). Data sourced from Scott's Medical Database and the 2016 Census highlighted instances of discordance between physicians' use of non-official languages and the percentage of the community speaking the same non-official languages. The authors conclude by describing the complex ethnic and gender differences they found and outline a number of policy options for provinces to enhance the supply of physicians that speak the same language as the community.

The final paper in this issue reports on the findings of a time-driven activity-based costing study in an ophthalmology integrated practice unit at the Kensington Eye Institute in Ontario (Sadri et al. 2021). Time-driven activity-based costing is a process for accurately attributing input costs to health outcomes through close measurement of clinical workflow. The information gained from this process informs decision makers about where to allocate their efforts and resources to reduce unwarranted variability or inefficiencies. This study demonstrated that the time-driven activity-based costing process was feasible and generated actionable information for the Kensington Eye Institute. The paper concludes with recommendations for scaling up this process to improve value from healthcare spending.

JASON M. SUTHERLAND, PHD
Editor-in-Chief

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ÉDITORIAL

COVID-19 et regard sur la résilience des fournisseurs de soins de santé

La pandémie de COVID-19 présente l'occasion de mesurer la résilience des fournisseurs de soins de santé financés par l'État, notamment avec la venue de nouvelles données. La résilience est importante car elle implique un niveau de confiance plus élevé dans la capacité de fournir les soins nécessaires en période de problèmes et désastres sanitaires, sociaux ou environnementaux.

Lors de la première vague de la pandémie de COVID-19, au début de 2020, des avertissements ont été émis concernant la capacité des hôpitaux à gérer avec succès de grands volumes de patients gravement atteints, qui se présenteraient dans les hôpitaux des provinces et territoires. Peu de temps après, les hôpitaux ont mis en œuvre des politiques de dégagement des lits d'hôpital – les rapports publics indiquent en effet que les hôpitaux sont rapidement passés d'une occupation presque complète à moins de 50 % (ICIS 2020a; Howlett 2020; Zeidler 2020).

Il est remarquable que les hôpitaux aient pu libérer des milliers de lits aussi rapidement. Pas plus tard qu'en 2019, le taux d'occupation des hôpitaux ontariens était souvent supérieur à 95 %; des patients apparemment immobiles attendaient des places dans d'autres milieux de soins (Bender et Holyoke 2018; Gouvernement de l'Ontario 2019).

Mesurer la résilience des hôpitaux

Le dégagement des lits d'hôpital et le transfert rapide de nombreux patients vers d'autres milieux de soins démontrent que les hôpitaux, en collaboration avec les autres fournisseurs de soins de santé et sociaux, ont fait preuve d'une résilience adaptative (Thomas et al. 2013). Cela indique que les hôpitaux sont capables d'absorber des catastrophes d'ordre sanitaire, tout en continuant à fournir des soins de santé essentiels.

Mais à quel prix s'est fait ce dégagement des lits? Il n'y a pas encore de données provinciales ou territoriales qui indiquent à quel point le déplacement des patients a entraîné une augmentation détectable de mortalité prématurée ou de morbidité excessive. Peut-être que les données en ce sens émergeront; mais si ce n'était pas le cas, et si les gains d'efficacité des hôpitaux pouvaient être maintenus sans compromettre les résultats pour les patients, cela démontrerait la capacité des hôpitaux à mettre en place rapidement de nouveaux processus de soins efficaces.

Pourtant, la résilience financière des hôpitaux est beaucoup moins claire. À court terme, la majorité du financement des hôpitaux provient des budgets globaux, et ils ne devraient pas avoir de problème à couvrir leurs coûts fixes puisqu'ils ont très peu de marge de manœuvre pour la réduction des dépenses. À moyen terme, les gouvernements provinciaux et territoriaux compteront moins de patients ayant eu accès à des traitements non urgents, tandis que les listes d'attente pour les chirurgies continueront de s'allonger. En Colombie-Britannique, par exemple, la réponse politique a été d'engager des centaines de millions en nouvelles dépenses afin d'accroître la capacité chirurgicale (Gouvernement de la Colombie-Britannique 2020). À plus long terme, l'intention des gouvernements de financer une capacité accrue n'est pas claire et il pourrait en résulter une combinaison d'insécurité financière pour les hôpitaux et le personnel, d'érosion des services et d'attentes plus longues pour les problèmes de santé qui ne mettent pas la vie en danger.

Résilience des autres secteurs

Le coût du dégagement des lits d'hôpital a-t-il été déplacé vers les soins de longue durée? Si la situation d'urgence en matière de santé publique a permis de démontrer la résilience des hôpitaux, on ne peut pas en dire autant des soins de longue durée. Une confluence de facteurs liés aux résidents, au personnel, aux foyers de soins, au système de santé et aux services sociaux a donné, dans certains cas, des résultats catastrophiques pour les bénéficiaires, leurs familles et le personnel (Holroyd-Leduc et Laupacis 2020). Il faudra des années pour comprendre l'impact du manque de résilience dans les soins de longue durée et pour rectifier les lacunes révélées par la COVID-19 (Armstrong et al. 2020; Webster 2021).

Certaines données statistiques montrent que les soins médicaux fournis par le secteur privé ont fait preuve de résilience adaptative, avec plus de 50 % des soins offerts de façon virtuelle dans les mois suivant le début de la pandémie (ICIS 2020b). Le maintien de ces changements dans la prestation des soins médicaux peut particulièrement profiter aux personnes qui résident dans des régions rurales ou éloignées et pour qui les déplacements sont coûteux ou peu pratiques.

Outre les soins de longue durée et les soins médicaux, on attend l'émergence d'indicateurs clairs de la résilience des autres secteurs. Les maisons de soins infirmiers et les soins à domicile ont aussi été confrontés à un afflux de patients sortant des hôpitaux plus tôt que prévu. Étant donné que ces secteurs sont financés par une combinaison de fonds privés et publics, leur résilience financière est particulièrement importante pour maintenir la capacité des services fournis dans la communauté.

Suivi de la résilience pour l'avenir

La saga de la pandémie de COVID-19 et les facteurs de stress qu'elle a induits sur les fournisseurs de soins de santé des provinces et des territoires ont montré certaines forces et faiblesses des systèmes de santé et de services sociaux.

Il est hautement souhaitable pour les provinces et les territoires de disposer de fournisseurs de soins de santé résilients qui continueront à fournir des soins de santé, quels que soient les défis des catastrophes à venir. La résilience du système de santé est primordiale pour éviter des souffrances inutiles et des décès prématurés.

La résilience des provinces et des territoires se caractérisera par leur capacité à s'adapter à de nouveaux défis, telle que la pandémie de COVID-19; par une transformation de la pratique afin d'y introduire les nouvelles technologies; et par leur solvabilité. En gardant ces éléments à l'esprit, les provinces et les territoires devraient pouvoir élaborer un processus de surveillance et de renforcement de la résilience dans tous les secteurs de la santé.

Dans le présent numéro de *Politiques de Santé*

Ce numéro présente un article de discussion et débat qui engage le lecteur à tenir compte des conséquences sociosanitaires à court et à long terme d'une consommation accrue d'alcool en raison de la pandémie de COVID-19 (Hartney 2021). L'auteure note qu'en raison des politiques de protection et de distanciation sociale émises par les bureaux de santé publique, les services sociosanitaires liés à la surconsommation pourraient être inversement moins accessibles en cette période de besoins accrus. L'article appelle les gouvernements fédéral et provinciaux à adopter des politiques pour favoriser l'accès aux programmes de prévention qui visent une réduction de la consommation excessive d'alcool, en particulier parmi les groupes à haut risque, afin d'atténuer d'éventuels problèmes de santé ou sociaux.

Cet article de discussion et de débat est suivi d'une réplique, où les auteurs se concentrent sur les politiques provinciales visant à assouplir les contrôles sur la disponibilité d'alcool pendant la pandémie (Lange et Rehm 2021). Ils soulignent le lien entre ennui, stress et facilité d'accès qui peuvent mener à l'abus d'alcool. Dans le même ordre d'idée, l'article appelle les provinces à réduire la disponibilité de l'alcool, à favoriser le dépistage et à améliorer les interventions qui ciblent la consommation excessive d'alcool.

Rapports de recherche

Le premier article de recherche porte sur la prévalence des problèmes de santé mentale chez les infirmières en Colombie-Britannique (Havaei et al. 2021). Faisant référence à des facteurs de risque complexes liés au travail, l'article indique que des niveaux élevés de dépression, d'anxiété et d'autres problèmes de santé mentale sont associés à l'absentéisme, au sentiment de moindre accomplissement personnel ainsi qu'à l'épuisement émotionnel. Au moyen d'une enquête transversale, les auteurs ont observé un excès de problèmes de santé mentale chez les infirmières et recommandent une évaluation confidentielle de leur santé mentale ainsi que des changements structurels dans les flux de travail afin de traiter les facteurs causaux.

Ensuite, une équipe d'auteurs a mené un examen de la portée des préférences des patients en matière de soins de santé parmi ceux qui souffrent de problèmes de santé spécifiques (Peckham et al. 2021). Citant les réformes visant à aligner les soins de santé et à améliorer l'approche centrée sur le patient, les auteurs ont entrepris un examen approfondi de la littérature afin d'identifier et de mesurer les besoins, les désirs et les préférences des patients. L'examen a révélé cinq thèmes de préférences pour un certain nombre d'états de santé : les soins personnalisés, la navigation, le choix, les soins holistiques et la continuité des soins. Cette étude est pertinente pour déterminer qui devrait faire partie des équipes de soins, comment s'engager efficacement avec les patients qui présentent différents états de santé et comment concevoir des initiatives d'amélioration des services de santé qui correspondent aux préférences des patients.

L'article suivant se penche sur la question de l'engorgement et des temps d'attente prolongés dans les services des urgences. On y rend compte des résultats d'une analyse quantitative sur la durée des séjours aux urgences dans un échantillon d'hôpitaux des régions urbaines de l'Ouest canadien (Kreindler et al. 2021). Au moyen de données transversales provenant du Système national d'information sur les soins ambulatoires, la modélisation approfondie n'a trouvé aucune preuve claire de performances élevées ou faibles. Les auteurs concluent que pour alléger la pression exercée sur les urgences, il faut se doter de politiques pour de nouveaux modèles de soins ambulatoires, notamment en reflétant les besoins locaux et la capacité des communautés.

Dans le contexte de la connaissance linguistique et des communications inadéquates entre patients et fournisseurs de soins, l'article suivant analyse deux ensembles de données pour mesurer la concordance entre l'utilisation par les médecins et les patients de langues non officielles, dans un échantillon provenant des plus grandes régions urbaines au Canada (Ariste et Matteo 2021). Les données de la base de données médicales Scott's et du recensement de 2016 mettent en évidence des cas de discordance entre l'utilisation par les médecins de langues non officielles et le pourcentage des membres de la communauté qui parlent ces langues. Les auteurs concluent en dressant le portrait des différences ethniques et sexuelles complexes qu'ils ont constatées et proposent des pistes afin d'optimiser le nombre de médecins qui parlent la même langue que la communauté desservie.

Le dernier article du présent numéro rend compte des résultats d'une étude sur la méthode des coûts par activités en fonction du temps dans une unité d'ophtalmologie du Kensington Eye Institute, en Ontario (Sadri et al. 2021). L'établissement des coûts en fonction du temps et des activités est un processus qui permet d'attribuer avec précision les coûts des intrants aux résultats de santé grâce à une mesure précise du flux de travail clinique. Les informations ainsi obtenues éclairent les décideurs sur les domaines où allouer les efforts et les ressources afin de réduire la variabilité injustifiée ou les inefficacités. Cette étude a démontré que la méthode des coûts par activités en fonction du temps est faisable et génère des renseignements exploitables pour le Kensington Eye Institute. Le document se termine par des recommandations pour l'intensification de ce processus afin d'améliorer la valeur des dépenses de santé.

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Rédacteur en chef

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DISCUSSION AND DEBATE

The Shadow Pandemic of Alcohol Use during COVID-19: A Canadian Health Leadership Imperative

La pandémie cachée de la consommation d’alcool pendant la COVID-19 : un impératif en matière de leadership en santé au Canada

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Abstract

Increased alcohol consumption among Canadians during the COVID-19 pandemic will impact our health systems in the short and longer term, through increased hospitalizations due to alcohol-related illness, addiction, violence and accidents. The increased stress due to involuntary unemployment, confinement and boredom during the pandemic has led to an escalation in alcohol use. It is imperative that policy makers recognize and address the inherently conflicting roles of provincial/territorial governments as regulators/retailers of alcohol and funders of healthcare and prioritize the development and implementation of an evidence-based framework to mitigate the increased population health risks of alcohol-related harms.

Résumé

L’augmentation de la consommation d’alcool chez les Canadiens pendant la pandémie de COVID-19 aura un impact sur les systèmes de santé à court et à long terme; impact résultant d’une augmentation des hospitalisations en raison de maladies liées à l’alcool ainsi que de problèmes de toxicomanie, de violence et d’accidents. Le stress accru dû au chômage involontaire, au confinement et à l’ennui pendant la pandémie a conduit à une escalade de

la consommation d'alcool. Il est impératif que les décideurs reconnaissent et abordent les rôles intrinsèquement contradictoires des gouvernements provinciaux et territoriaux en tant qu'organismes de réglementation et détaillants d'alcool, mais aussi de bailleurs de fonds pour les soins de santé. Les décideurs doivent prioriser l'élaboration et la mise en œuvre d'un cadre fondé sur les données probantes afin d'atténuer les risques accrus pour la santé liés à l'alcool.

Introduction

Alcohol use is common in Canada; a recent study indicated that 83% of adults drink alcohol, and 42% report binge drinking. Prior to the pandemic, alcohol was estimated to be directly responsible for 77,000 hospitalizations annually (CIHI 2017). Heavy drinking in adults increased from 15% in 2000–2001 to 20% in 2013–2014 (Willmore et al. 2017). During March and April 2020, which marked the beginning of the COVID-19 quarantine period, liquor stores were deemed an essential service, and self-reported alcohol consumption increased by nearly 20% in Canadians aged 15–49 years, while less than 10% of Canadians in that age group reported drinking less alcohol (Statistics Canada 2020). Survey data indicated that increased drinking was due to the lack of regular schedule, boredom and stress (NANOS 2020). Given the extended duration of the quarantine, this has created circumstances where vulnerable individuals could develop alcohol-related disorders that might otherwise have been avoided. The inherently conflicting roles of provincial/territorial governments as both regulators and retailers of alcohol as well as funders of healthcare urgently needs to be addressed if the resulting harm is to be managed at a population level.

Simultaneously, the reduction of available health services not directly related to COVID-19 has impacted the public's access to services that could provide early intervention or ongoing treatment for heavy drinking. Patient-oriented research indicates the importance of supportive, trauma-informed relationships between physicians and people who use substances (Hartney et al. 2020), which are undermined by limited access, social distancing and infection-control strategies such as wearing masks. Any delay in help-seeking behaviours in people with substance-related problems is likely to increase the threshold for intervention to higher levels of impairment. As a result, there is a strong likelihood that people will have a greater severity of alcohol-related disorders when they do present for treatment, placing additional strain on the health system.

Despite the ubiquity of alcohol use, research on untreated heavy drinking is scarce, both in Canada and internationally. A large-scale, longitudinal study conducted by the Department of Health in the UK provided insight into a variety of aspects of untreated heavy drinking, including motivations to drink heavily, dependence on alcohol and potential influences on readiness to change (Hartney et al. 2003), and increased health system use over time (Rolfe et al. 2008).

The numerous negative short- and long-term health consequences of risky and excessive alcohol use are well established by decades of clinical research. Particularly concerning during the COVID-19 pandemic is the increased vulnerability of heavy drinkers to lung diseases, including pneumonia, tuberculosis, respiratory syncytial virus infection and acute respiratory distress syndrome, all of which are caused by impaired immune responses (Simet and Sisson 2015). In the context of a novel virus that primarily assaults the lungs, increased heavy drinking could have significant repercussions on hospitalizations and mortality rates during subsequent waves of the COVID-19 pandemic.

It has been known for decades that alcohol-related harms occur in those who drink moderately as well as those who drink heavily, and the "prevention paradox" – which argues that population-wide approaches might best address alcohol-related harms – has long been debated (Stockwell 2006). Research has demonstrated that over 50% of people who died of cancer attributable to alcohol were moderate drinkers, consuming within weekly guidelines (Sherk et al. 2020). In addition, although effective evidence-based treatments have been developed, there are numerous systemic barriers to those seeking treatment by accessing withdrawal management and treatment services (Timko et al. 2015).

Intersection with Mental Health and Substance Use

People with mental health problems, such as depression, are at an elevated risk of excessive alcohol use and its consequences (Bell et al. 2015). People with post-traumatic stress disorders are particularly vulnerable (Leeies et al. 2010). For many people, alcohol is a way of coping with difficult emotional states. With other, healthier outlets for managing negative feelings no longer available, such as social interaction, exercise, and activities outside of the home, the pandemic could exacerbate the narrowing of repertoire of activities connected to drinking, which is a well-recognized symptom of alcohol use disorder (Hartney et al. 2003). This is a significant concern in the current pandemic – creating conditions that could escalate symptoms of depression and post-traumatic stress disorder through the disruption of normal life, and the potential for people to witness their loved ones' pain, illness and demise without the culturally expected mechanisms for comfort or grieving.

Alcohol-related problems also predispose drinkers to using other psychoactive substances, such as tobacco, and may increase vulnerability to other substance-related disorders. The current pandemic intersects with an opioid crisis that has claimed the lives of thousands of illicit and prescribed opioid users. Staying home and having restricted access to sources of other drugs may create a greater dependence on alcohol for intoxication among people who use other substances.

Intersections with Age, Race and Gender

Specific subpopulations have been identified as being at elevated risk associated with alcohol consumption. While men have long been recognized as heavier drinkers in many cultures in Canada (Spithoff 2019) and internationally (Casswell et al. 2018), women's alcohol use has escalated, with a 240% increase in alcohol-related hospital visits by young women (Spithoff 2019). Johnston (2015) has identified the "pinking" of alcohol marketing as a key influence on the increase in women's drinking, particularly the portrayal of women's drinking as synonymous with self-medication and purported gender equality. Given the short- and long-term health risks associated with alcohol-related harm in women as well as men, it is imperative that we better understand the causes and effects of these demographic shifts. Some progress has been made in this regard: in a sex- and gender-based analysis, Peralta et al. (2018) found that regardless of sex, a masculine gender orientation was positively associated with heavy episodic drinking, while a feminine gender orientation with decreased risk. Further research is needed to establish precisely how this relates to alcohol-related harms among men and women.

Research has revealed even greater vulnerabilities in more marginalized women. Veldhuis et al. (2020) identified the specific vulnerabilities of sexual minority women, particularly when ethnicity was also considered. The specific role of alcohol in the lives of women is in urgent need of further study if we are to mitigate the potential harms it poses to members of society who are already experiencing stigma and social disadvantage.

Similarly, there are also cultural variations in alcohol use and its prevention. Importantly, for Canada, research indicates that Indigenous people may be at a higher risk of heavy drinking than non-Indigenous people (Kyu et al. 2015). Cultural sensitivity is required as we seek to better understand Indigenous drinking patterns, as stigmatizing stereotypes regarding alcohol use by Indigenous peoples have reinforced racism within the Canadian health system. Research exploring patterns of alcohol use among off-reserve Indigenous people has identified the need for culturally specific approaches to alcohol prevention (Ryan et al. 2016). Therefore, Indigenous-led, trauma-informed, culturally safe research and interventions are required to address this important healthcare need.

Collateral Damage

In addition to the health harms caused directly by alcohol use, as discussed earlier, indirect or collateral damage from alcohol use also has a massive impact on the Canadian health system. Many injuries, hospitalizations and untimely deaths are the result of alcohol-induced violence and drunk-driving accidents (Giesbrecht et al. 2010). The more frequently people drink, the more negative consequences are experienced (Kuntsche et al. 2008). These consequences create some of the most severe and distressing injuries the healthcare workforce routinely faces, arising from motor vehicle accidents and family violence. These injuries appear in hospital emergency departments every day and are entirely preventable. Yet, with the lack of recognition of alcohol use as a legitimate societal concern, they come to the attention of the parts of the healthcare system that are least able to intervene in a way that could mitigate further harms, such as hospital emergency departments. Attempting to treat the casualties of alcohol-related violence and accidents is traumatic for both healthcare staff and patients, and undermines the emotional well-being of our healthcare workforce, which ironically reinforces alcohol use in these occupational groups as a way of coping with vicarious trauma.

Heavy drinking has profound impacts on the family (Orford et al. 2002), and as indicated earlier, parental alcohol use poses significant physical, psychological and social risks to children (Hartney and Barnard 2015). Research exploring the intersection of gender and violence showed that younger male heavy drinkers most frequently self-reported involvement in violence, while women's involvement in violence was rarely discussed (Rolfe et al. 2009). This clearly points to the abovementioned association between the stereotypical masculine identity and heavier alcohol use, compounded by positive perceptions of violence associated with masculinity. Meanwhile, women's involvement in violence, whether as perpetrators or victims, remains invisible and unacknowledged.

The relationship between alcohol use and high-risk sexual behaviour is well established (Plant 1990), and it has been speculated that alcohol use may impact adherence to social distancing (Stockwell et al. 2020), thus increasing the risk of COVID-19 infection among drinkers.

Responsible Alcohol-Related Health Policy during the COVID-19 Pandemic

When we consider the short- and long-term health risks associated with alcohol use, it seems surprising that healthcare leaders and other policy makers do so little to intervene. However, the involvement of the healthcare system in addressing the risks of alcohol use has been minimal – given the extent of the problem and its relevance to healthcare – and largely counterproductive, given recent evidence regarding increases in alcohol use cited above. How can this be explained in the context of a pandemic that has drawn together political opponents, healthcare providers and the community in a united effort to reduce the potential harms of COVID-19, a health risk that, though significant, pales in comparison to the harms emergent from alcohol use? Indeed, how can we justify daily messaging on social distancing while remaining silent on the use of a substance that has more far-reaching and detrimental effects on the health of individuals and communities?

The answer lies in the tension between the liberal substance use policy that emphasizes individual freedom (which clearly has important social functions) and a responsible approach to the promotion of health and prevention of alcohol-related harms, which is recognized by decades of research and accumulated health data. Clear, unambiguous health messaging regarding the impacts of alcohol should not be conflated with an authoritarian, out-of-touch, oppressive, restrictive or puritanical attitude toward individual choice. Clearly, people do have the choice to drink heavily, thereby increasing the risk of harms to themselves and others just as they have the choice to drive under the influence and to commit violent acts and injure their loved ones while under the influence. The question is whether policy makers recognize their role in maintaining a worsening situation in the context of the COVID-19 pandemic. Do we continue to passively stand by and absorb the financial and human costs of escalating alcohol use? Do we continue allowing our hospitals and morgues to accommodate the casualties of an indifferent leadership stance on alcohol use during the COVID-19 pandemic? Do we simply continue to pour public funds into charities and safe houses for women and children fleeing violence? Or do we recognize the immediate and long-term benefits of a well-designed, comprehensive, evidence-based and effective health promotion and prevention framework that could prevent the untold misery and healthcare costs associated with alcohol use?

A Proposed Solution

Assuming that policy leaders recognize the importance of preventing and mitigating alcohol-related harms to the health of the Canadian population, how should they proceed? While there is clearly a need for immediate research to better understand the psychology of alcohol use and resulting behaviours during and after the pandemic, a good starting point would be to develop a comprehensive, evidence-based framework of prevention and treatment approaches for alcohol-related problems that recognize the specific demographic and social vulnerabilities according to gender, age and intersecting variables. Responsibility for the framework should be shared between federal and provincial policy makers and put into practice locally. While leading the development of this high-level framework would ideally be a federal responsibility through an agency such as the Public Health Agency of Canada, implementation plans would need to be developed provincially, along with identifying and addressing the specific needs of the subpopulations in local areas (for e.g., Indigenous peoples or people at particularly high risk of alcohol-related harms, such as illicit alcohol users in the downtown east side of Vancouver, BC).

In concert with this, a psychologically informed public health and communication strategy could make the application of this framework effective in reducing heavy drinking, thereby mitigating the consequent damage. Recent interventions to reduce the spread of COVID-19 are proof that the Canadian public are willing and able to significantly change their behaviours when presented with a compelling case for the well-being of their community. Finally, a coordinated response to patients presenting with alcohol-related health problems that provides the emotional and practical supports to mitigate alcohol-related harms could avert a future health crisis resulting from an unrecognized shadow pandemic of alcohol overuse. As stated earlier, a layered response involving high-level expectations regarding the continuum of care being provided by federal policy makers, in combination with local service delivery at the health authority and community levels, would best address the specific needs of local people. Ideally, this local planning would involve healthcare providers (from emergency, primary care and specialized care), professionals from other systems impacted by alcohol use (such as police and child welfare) and patient representatives. Evidence-based interventions could then be integrated into each point in the existing infrastructure, supplemented with new evidence-based initiatives to provide prevention and early intervention services.

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Commentary: The COVID-19 Pandemic Is Not a Good Time to Weaken Restrictions on Alcohol Availability

Commentaire : la pandémie de COVID-19 n'est pas le moment adéquat pour alléger les restrictions sur la disponibilité de l'alcool

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Abstract

Alcohol use is well established globally as one of the major risk factors for burden of disease and mortality. Although it is not yet clear how the COVID-19 pandemic has impacted the overall level of alcohol use in Canada, we do know that various levels of government have promoted its use – either by designating it essential or by increasing its availability. Such actions may have both an immediate and sustained impact on alcohol-related harm in Canada. We encourage all levels of government to support and prioritize the development and implementation of an evidence-informed framework for both alcohol policy and service delivery to reduce alcohol-related harms during the current pandemic and beyond.

Résumé

La consommation d'alcool est bien reconnue dans le monde comme l'un des principaux facteurs de risque pour la charge de morbidité et de mortalité. Bien que l'on ne connaisse pas encore clairement l'impact de la pandémie de COVID-19 sur le niveau général de

consommation d'alcool au Canada, nous savons que divers paliers de gouvernement en ont encouragé l'utilisation – soit en le désignant comme essentiel, soit en augmentant sa disponibilité. De telles actions peuvent avoir un impact immédiat et durable sur les méfaits liés à l'alcool au Canada. Nous incitons tous les paliers de gouvernement à soutenir et à prioriser l'élaboration et la mise en œuvre d'un cadre fondé sur les données probantes pour la politique sur l'alcool et pour la prestation de services afin de réduire les méfaits liés à l'alcool pendant la pandémie en cours et après celle-ci.

Introduction

There is no doubt that the call to action by Hartney (2021) deserves the attention of all levels of government and decision makers. However, the claim of an alcohol-use epidemic in Canada being overshadowed by the COVID-19 pandemic may be a bit premature.

Alcohol Use in Canada – Is It Increasing?

In Canada, the per capita (in individuals 15+ years of age) consumption of alcohol (in litres of pure alcohol) has remained relatively stable since the early 2000s. However, heavy episodic drinking (defined as consuming at least 60 grams or more of pure alcohol on at least one occasion in the past 30 days) has been on the rise pre-pandemic (Manthey et al. 2019). How the COVID-19 pandemic has impacted the level of alcohol use in Canada is not yet clear and will only be fully understood once all the alcohol sales statistics and hospitalization data can be triangulated with survey estimates (for triangulation methods, see the articles by Kehoe et al. [2012] and Rehm et al. [2010]).

Currently, data from different survey cycles are not in agreement with one another. For example, the first Statistics Canada survey (2020) indicated that, overall, individuals increased their alcohol use during the pandemic. However, the latest survey reported a more balanced picture – with the percentage of those individuals reporting increased consumption (24%) being almost equal to those reporting decreased consumption (22%) (Statistics Canada 2021). Similarly, alcohol sales data are not fully conclusive. Thus, the overall level of drinking during the pandemic will only be known after data sources are carefully triangulated (Rehm et al. 2021).

While we do not know whether alcohol use has actually increased, there are some facts that are clear. Alcohol retail stores have been designated as an "essential service," and restrictions on home delivery and takeout from restaurants have been loosened in some provinces and territories (Neufeld et al. 2020), thus increasing the availability of alcohol. This increase in off-premise availability is, of course, being balanced in part by restrictions on on-premise drinking. Regardless, greater availability has been shown to impact both heavy alcohol use and alcohol-related harms (Popova et al. 2009). Therefore, the inherent promotion of alcohol use by designating it as essential and an increase in alcohol availability during the pandemic are likely to have both an immediate (via an increase in heavy alcohol use) and sustained (via long-term heavy use leading to an increase in the prevalence of alcohol use disorders in the coming years) impact on alcohol-related harm, especially if such provisions extend beyond the pandemic (Jennison 2004). The impact had will be above and beyond what is already expected with the economic contraction and social restrictions of the pandemic (e.g., Rehm et al. 2020).

Preliminary data from the last Statistics Canada survey, conducted in January 2021, also indicate that those who had increased their alcohol consumption during the pandemic were most likely to report frequent heavy drinking due to boredom, stress and convenience (e.g., access to alcohol) as the most common reasons for increasing their alcohol use (Statistics Canada 2021). These associations have been found not only in Canada but also in a large survey conducted in more than 20 European countries (Manthey et al. 2020). If further research corroborates this finding, it would mean that the pandemic has led to the polarization of drinking behaviour: individuals who experienced boredom and stress increased their alcohol use, while those who did not decreased their use.

Conflict of Interest: Regulators/Retailers of Alcohol and Funders of Healthcare

As Hartney (2021) accurately points out, the roles of provincial and territorial governments as regulators/retailers of alcohol as well as funders of healthcare are in conflict. However, the alternatives – privatized alcohol retail and/or privatized healthcare systems – are a scary thought. Evidence from different provinces in Canada shows that privatized alcohol retail systems, compared to government-owned alcohol retail systems, are associated with negative health outcomes, such as increased alcohol-related deaths (Stockwell et al. 2011; Trolldal 2005). Although not the case everywhere, in recent years there have been changes in several Canadian jurisdictions involving privatization of alcohol retailing. Zalcman and Mann (2007), for example, used a multiple interventions time-series design and demonstrated that three distinct events of alcohol privatization in Alberta were associated with either temporary or permanent increases in the rate of death by suicide during the study period (1976–1999). In the context of the ongoing COVID-19 pandemic, suicide/crisis hotlines are already reporting an unprecedented increase in the number of calls being received (Richmond 2020; Wright 2020). This begs the question: Do we really want to see privatization of alcohol retail now, or ever?

Alternatively, the government could privatize healthcare to eliminate this perceived conflict of interest. However, it is pretty clear that a privatized healthcare system would create inequities in terms of access and quality of care (Angell 2008). For example, in a privatized healthcare system, there is a lack of congruence between need and ability to pay, with those with the greatest medical need being the least able to pay (Angell 2008). In sum, only well-insured patients may benefit from such a system. With respect to alcohol use, it has been shown that high amounts of weekly alcohol consumption and problem drinking are associated with an increased risk of unemployment (Jørgensen et al. 2019). Thus, such individuals would not fare very well in a privatized healthcare system.

Policy-Specific Recommendations

Unsurprisingly, it is well known that the alcohol policy environment can have strong effects on population-level alcohol consumption and, thus, alcohol-related harms (Babor et al. 2010; Burton et al. 2017). One of the mechanisms through which policy can be used to control alcohol use almost instantly is through reduced alcohol availability (i.e., through restricting hours of sale and the number of outlets) (Babor et al. 2010). Policy decisions made during the COVID-19 pandemic can have unintended consequences. For instance, the decision of some provincial/territorial governments to erode restrictions on home delivery and takeout of alcohol from restaurants has increased the availability of alcohol and will likely have an impact on heavy alcohol use and alcohol use disorders in the long run – thus resulting in an increase in alcohol-related harms. At a time when the healthcare system is already overburdened, precautionary measures should be taken to reduce any additional burden due to, in this case, alcohol-attributable conditions. The decision of the federal government to deem alcohol sales an essential service is in no way a "precautionary measure". In addition to population-level interventions, there are effective indicated prevention strategies that target alcohol use, such as increased screening and brief intervention for people with at-risk alcohol consumption (Angus et al. 2014; Kaner et al. 2018).

With this, we encourage provinces and territories to do the following:

- Maintain government monopolies on alcohol sales, and maintain a strong social responsibility mandate.
- Limit the availability of alcohol by reducing hours of sale and the number of alcohol outlets during the ongoing COVID-19 pandemic.
- Reinstate the restrictions on takeout and delivery of alcohol with food in places where such policies were eroded. Although this should be done now, if it is not, it most certainly should be done as soon as the pandemic is over.
- Place an emphasis on screening, brief interventions and referral at the primary care level.

Conclusion

As it stands, the government has unintentionally sent the public the message that alcohol is essential in our lives and has, thus, encouraged its consumption. Given that alcohol use is well established as one of the major risk factors for mortality and burden of disease, we echo the call of Hartney (2021) for governmental support and prioritization of the development and implementation of an evidence-informed framework for both alcohol policy and service delivery. This framework should be developed with the goal of curbing consumption and reducing alcohol-related harms and associated costs during the current public health crisis and beyond.

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RESEARCH PAPER

Describing the Mental Health State of Nurses in British Columbia: A Province-Wide Survey Study

Description de l'état de santé mentale des infirmières en Colombie-Britannique : une enquête à l'échelle provinciale

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Abstract

A cross-sectional province-wide survey study of 3,978 British Columbia (BC) nurses was conducted to explore the mental health state of the nursing workforce in BC. About one third of nurses reported depression and anxiety; about half reported symptoms of post-traumatic stress disorder and at least one third reported high levels of one or more dimensions of burnout. Mental health problems were about 1.5 to 3 times more prevalent among BC nurses compared to their peers nationally. Improving nurses' mental health requires multi-factorial and multi-level efforts. Evidence-based and workplace-specific policies and interventions that better support nurses at risk are recommended.

Résumé

Une étude transversale à l'échelle de la province auprès de 3 978 infirmières a été menée pour explorer l'état de santé mentale de la main-d'œuvre infirmière en Colombie-Britannique. Environ un tiers des infirmières ont fait état de dépression et d'anxiété; environ la moitié d'entre elles ont signalé des symptômes de trouble de stress post-traumatique et au moins un tiers ont signalé des niveaux élevés d'un ou plusieurs aspects de l'épuisement professionnel. Les problèmes de santé mentale étaient d'environ 1,5 à 3 fois plus fréquents chez les infirmières de la Colombie-Britannique que chez leurs pairs à l'échelle nationale. L'amélioration de la santé mentale des infirmières exige des efforts multifactoriels et à plusieurs niveaux. On recommande la mise en place de politiques et d'interventions fondées sur les données probantes et propres aux milieux de travail pour mieux soutenir les infirmières à risque.

Introduction

Mental health problems are one of the leading causes of disability internationally, with about 11% of the world population – equivalent to 792 million people – estimated to have one or more mental health disorders (Ritchie and Roser 2018; WHO 2021). While employment is believed to positively impact mental health, a negative work environment with frequent exposure to risk factors plays a major role in compromising employees' mental health and well-being (Government of Canada 2016; WHO 2021). According to the World Health Organization (2021), employee depression and anxiety alone cost the global economy over one trillion USD in lost productivity each year. In Canada, every week, at least 500,000 employees are unable to work due to poor mental health (MHCC 2017), costing Canadian employers more than $6 billion due to increased absenteeism, increased turnover and lost productivity in 2011 (MHCC 2017).

Nurses and other frontline healthcare providers are exposed to many work-related risk factors, such as heavy workloads and workplace violence, and subsequently are at a greater risk of mental health challenges (Aiken et al. 2013; Berrios et al. 2015; Brandford and Reed 2016; Poghosyan et al. 2010; Spector et al. 2014). Research shows that a disproportionately high percentage of the nursing workforce worldwide suffers from conditions such as depression, anxiety, post-traumatic stress disorder (PTSD) and burnout, and these conditions affect their ability to function well in the workplace and provide safe, quality patient care (CFNU 2017; Shahri et al. 2017; Shields and Wilkins 2006; Tung et al. 2018). Furthermore, poor mental health has been linked to increased nurse absenteeism (Davey et al. 2009) and turnover (Hayes et al. 2012; O'Brien-Pallas et al. 2010). Given an alarming shortage of professional nurses worldwide (WHO 2020) and in Canada (Murphy et al. 2012), studying the mental health of the nursing workforce is an urgent undertaking. The purpose of this study is to identify the prevalence of mental health problems among the nursing workforce in British Columbia (BC), Canada.

Literature Review

The World Health Organization (2018) defines mental health as "a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community." In research, mental health is often conceptualized as the absence or presence of mental health disorders such as depression, anxiety and PTSD. While anxiety (4%) and depression (3%) are two of the most prevalent mental health disorders worldwide (Ritchie and Roser 2018), some of the less common mental health disorders, such as PTSD (1%), are associated with a greater risk of severe consequences, such as suicide (Gradus 2018; Karam et al. 2014).

Each mental health disorder has its own unique characteristics. Depression is a mood disorder characterized by persistent feelings of sadness, hopelessness, and loss of interest for two weeks or more (Kroenke et al. 2001). Anxiety refers to persistent, excessive and unnecessary worry about a variety of events or activities (Spitzer et al. 2006). PTSD develops because of exposure to a traumatic event and is characterized by a triad of common symptomology consisting of hyper-arousal (e.g., impaired concentration, hypervigilance), avoidance of reminders of the event and re-experiencing the event through nightmares or flashbacks (Kerasiotis and Motta 2004).

In contrast with these mental health disorders, burnout is an occupational syndrome resulting from chronic workplace stress and is characterized by high levels of emotional exhaustion (EE), depersonalization (DP) and reduced personal accomplishment (PA) (Maslach et al. 2017). EE refers to feelings of emotional overextension and exhaustion; DP refers to feelings of detachment and indifference; and reduced PA refers to feelings of inadequacy in work performance (Maslach et al. 2017). A variety of approaches is used to detect and quantify burnout. Nurse researchers often quantify burnout through subscale cutoff scores, which are based on recommendations from an older version of the *Maslach Burnout Inventory Manual* (Adriaenssens et al. 2015; Maslach et al. 1996). A less common approach is Leiter and Maslach's burnout profile approach, which has been described as the most appropriate method of detecting burnout in the most recent version of the *Maslach Burnout Inventory Manual* (Maslach et al. 2017). This approach identifies five burnout profiles on a continuum ranging from burnout on the negative extreme to engagement on the positive extreme, with three intermediate profiles between the two extremes: disengaged, overextended and ineffective (Leiter and Maslach 2016). Overall, while the worldwide prevalence of burnout is unknown, a recent Gallup study of nearly 7,500 full-time employees estimated the rate of burnout to be about 28% in the US (Wigert 2020). However, due to a lack of consensus on a clear-cut metric for measuring burnout, any estimate of prevalence has limited utility. Whatever the prevalence of burnout may be, reducing it is a worthwhile idea.

When compared to the general working population, the nursing workforce is at a greater risk of developing mental health problems due to work-related risk factors (Aiken et al. 2013; Berrios et al. 2015; Havaei and MacPhee 2020a, 2020b; Havaei et al. 2020; MacPhee et al. 2017; Poghosyan et al. 2010; Spector et al. 2014; WHO 2021). International reviews estimated that 34% of nursing students aged 17 to 28 years suffered from depression (Tung et al. 2018). A study by Shahri et al. (2017) estimated that 22% of Iranian nurses suffered from depression. The prevalence of depression and anxiety among Australian nurses has been reported at 32% and 41%, respectively (Maharaj et al. 2018). The prevalence of PTSD is estimated at 14% among the general nursing population, ranging from 24% to 29% among intensive care unit nurses (Mealer et al. 2007) and from 9% to 10% among mental health nurses (Jacobowitz 2013). For burnout, a seminal study conducted in six countries found that this phenomenon was least prevalent among German nurses and most prevalent among Japanese nurses (Poghosyan et al. 2010). More recently, a European study of nurse burnout conducted in 12 countries found that 27% of European nurses experienced high EE, 10% experienced high DP and 17% experienced low PA (Dall'Ora et al. 2015). A systematic review of burnout studies among emergency nurses between 1989 and 2014 estimated the prevalence of nurse burnout as 26% (Adriaenssens et al. 2015). These studies used subscale cutoff scores to measure burnout.

Mental health problems are particularly prevalent among Canadian nurses. In Canada, a 2005 national survey found that one in every five Canadian nurses had difficulties managing their work due to mental health problems, and one in every 10 Canadian nurses suffered from depression – about twice the national average for working women (CFNU 2017; Shields and Wilkins 2006). Canadian nurses also have higher rates of PTSD symptoms, ranging from 30% to 40% (CFNU 2017) – three to four times higher than the national average (Ameringen et al. 2008). In a study conducted in six countries, Canadian nurses had one of the highest rates of burnout (Poghosyan et al. 2010).

Given the strong correlation between mental health disorders and nurse absenteeism (Davey et al. 2009) and increased turnover (Hayes et al. 2012; O'Brien-Pallas et al. 2010), and in light of the forecasted nation-wide shortage of nurses (Murphy et al. 2012), it is important to evaluate the state of nurses' mental health in BC.

Method

This was a province-wide study of BC nurses using a cross-sectional descriptive design. An overwhelming majority of BC nurses are unionized (over 90%), and all unionized nurses (*N* = 48,000) were invited to participate in a survey study, advertised on multiple platforms, between October and December 2019. An e-mail invitation containing the survey link was distributed by the provincial union among nurse members. Several strategies including weekly e-mail reminders, a raffle draw and a two-month data collection interval were used to increase response rate. Overall, 5,512 surveys were returned, reflecting an estimated response rate of 12%. A precise response rate was difficult to determine due to the nature of the union's database and the uncertainty around whether or not the e-mail invitations reached members. For this study, only actively working nurses with complete mental health data were included, yielding a sample size of 3,978. Ethics approval was obtained from the University of British Columbia's Behavioural Research Ethics Board (H18-02724).

Measures

Depression was measured with the Patient Health Questionnaire (PHQ-9), which comprises nine items rated on a four-point scale ranging from 0 (not at all) to 3 (nearly every day) (Kroenke et al. 2010). The PHQ-9 asks respondents to report the frequency of experiencing symptoms meeting the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (*DSM-IV*) diagnostic criteria for depression, such as loss of energy and suicidal thoughts over the past two weeks (American Psychiatric Association 2000). Previous research has established the sensitivity and specificity of the PHQ-9 and identified the following cutoff sum scores: 0–4: none; 5–9: mild; 10–14: moderate; 15–19: moderately severe; and 20–27: severe depression (Kroenke et al. 2010). An exploratory factor analysis (EFA) using varimax rotation among the study sample showed a unidimensional factor structure explaining 51.1% of the variance (loadings: 0.50–0.82). Internal consistency was excellent (α = 0.93).

Anxiety was measured with the General Anxiety Disorder Scale (GAD-7), which consists of seven items rated on a four-point scale ranging from 0 (not at all) to 3 (nearly every day) (Spitzer et al. 2006). The GAD-7 asks respondents to report the frequency of experiencing symptoms meeting the *DSM-IV* diagnostic criteria for anxiety, such as feeling afraid as if something awful might happen or being so restless that it is hard to sit still, over the past two weeks. Previous research has established the sensitivity and specificity of the GAD-7 and identified the following cutoff sum scores:0–4: none; 5–9: mild; 10–14: moderate; and 15–21: severe anxiety (Kroenke et al. 2010; Spitzer et al. 2006). An EFA using varimax rotation among the study sample showed a unidimensional factor structure explaining 64.6 % of the variance (loadings: 0.70–0.91). Internal consistency was excellent (α = 0.90).

PTSD was measured with the Post-Traumatic Stress Syndrome-14 Questions Inventory (PTSS-14), which comprises 14 items rated on a seven-point scale ranging from 1 (never) to 7 (always) (Twigg et al. 2008). The PTSS-14 asks respondents to report the frequency of experiencing symptoms from the *DSM-IV* diagnostic criteria of PTSD, such as jumpiness, flashbacks or nightmares (Twigg et al. 2008). Previous research has established the sensitivity and specificity of the PTSS-14 and identified the following cutoff scores: sum scores of 14 to 45 representing no to mild PTSD and 46 to 98 representing PTSD (Twigg et al. 2008). An EFA using varimax rotation (forced) confirmed a unidimensional factor structure accounting for 49% of the variance (loadings: 0.56–0.77). Internal consistency was excellent (α = 0.93).

Burnout was measured by the 22-item Maslach Burnout Inventory–Human Services Survey (MBI-HSS), which comprises three subscales: EE (nine items, e.g., "I feel like I'm at the end of my rope"), DP (five items, e.g., "I don't really care what happens to my recipients") and PA (eight items, e.g., "I deal very effectively with the problems of my recipients"). Items were rated on a seven-point Likert scale ranging from 0 (never) to 6 (every day). An EFA using varimax rotation showed a three-factor structure explaining 48.9% of the variance (loadings = 0.38–0.85). The measure demonstrated excellent subscale and total scale internal consistencies (subscale α= 0.77–0.92; scale α = 0.83).

Two approaches were used to examine burnout: (1) subscale cutoff scores to categorize respondents into low, moderate and high levels; and (2) latent profile analysis (LPA) to identify respondents by profiles. Previously established cutoff scores were used for each subscale: EE: scores 0–16 representing low, 17–26 representing moderate and 27–54 representing high levels; DP: scores 0–6 representing low, 7–12 representing moderate and 13–30 representing high levels; PA: scores 0–31 representing low, 32–38 representing moderate and 39–48 representing high levels levels (Maslach et al. 1996; Schaufeli and Van Dierendonck 1995). Similar to previous research and for the purpose of benchmarking, high scores on EE and DP or high scores on EE and low scores on PA were used as reflective of burnout (Mind Garden 2019). In addition, we used person-centred analysis to replicate the five burnout profiles found by Leiter and Maslach (2016). High burnout was characterized by high EE, high DP and low PA; high DP reflected a disengaged profile; high EE was reflective of an overextended profile; low PA reflected an ineffective profile; and engagement was characterized by low EE, low DP and high PA (Leiter and Maslach 2016).

Analysis

Descriptive statistics such as frequencies, proportions, means and standard deviations were used to analyze the data using the Statistical Package for Social Sciences for Windows 25.0 (SPSS Inc., Chicago, IL, US). A Sankey flow diagram was created to display the proportion of nurses with a combination of various levels of burnout, as identified by the cutoff scores, using SankeyMATIC (http://sankeymatic.com/). The diagram enabled benchmarking our results against studies that have used other ways of scoring burnout. In addition, a series of LPAs using Mplus8 (Muthen and Muthen 2012) evaluated models with various numbers of profiles. Using an interactive process, LPA results provide several indicators of model fit, which together can inform decisions on selecting the number of profiles to pursue. The indicators include the Akaike information criterion (AIC), the Bayesian information criterion (BIC) and the Lo-Mendell-Rubin adjusted likelihood ratio (LMR). For AIC and BIC, smaller values indicate a better fit (Williams and Kibowski 2016); for Lo-Mendell and the bootstrapped likelihood ratio test, a significant value indicates a better fit than that provided by a model with one less profile (e.g., five versus four profiles) (Nylund et al. 2007). Entropy indicates the probability of accurate assignment of cases to a profile. In addition to evaluating these indicators of model fit, it is important to also examine the extent to which the resulting profiles are consistent with theoretical underpinnings of the phenomenon of interest.

Results

The sample demographics are shown in Table 1, available online at longwoods.com/

content/26500. An overwhelming majority of the participants was female (91%) and registered nurses (78%) and held a direct patient care role (90%). Most participants were between 25 to 44 years of age (60%, M = 40.3, SD= 11.6) with 10 or fewer years of nursing experience (52%) and an undergraduate degree (49%). Moreover, most participants worked full time (63%) in an urban (62%) acute care setting (74%).

Table 2 shows descriptive statistics on the four mental health variables. About 31% of the participants met the criteria for moderate-to-severe depression (*M* = 7.6, *SD* = 5.9). Almost 29% met the criteria for moderate-to-severe anxiety (*M* = 7.1, *SD* = 5.5). Almost 49% of the sample met the cutoff point indicating substantial symptoms of PTSD (*M* = 45.0, *SD* = 18.2). According to burnout cutoff scores, about 56% of the respondents had high EE (*M* = 28.4, *SD* = 12.9), 31% had high DP (*M* = 9.2, *SD* = 6.9) and 32% had low PA (*M* = 34.3, *SD* = 7.9). As shown in the Sankey flow diagram, 35% (*N* = 1,400) had at least "high scores on EE and DP" or "high scores on EE and low scores on PA" (Figure 1).

FIGURE 1. A Sankey flow diagram for a combination of various levels of burnout subscales

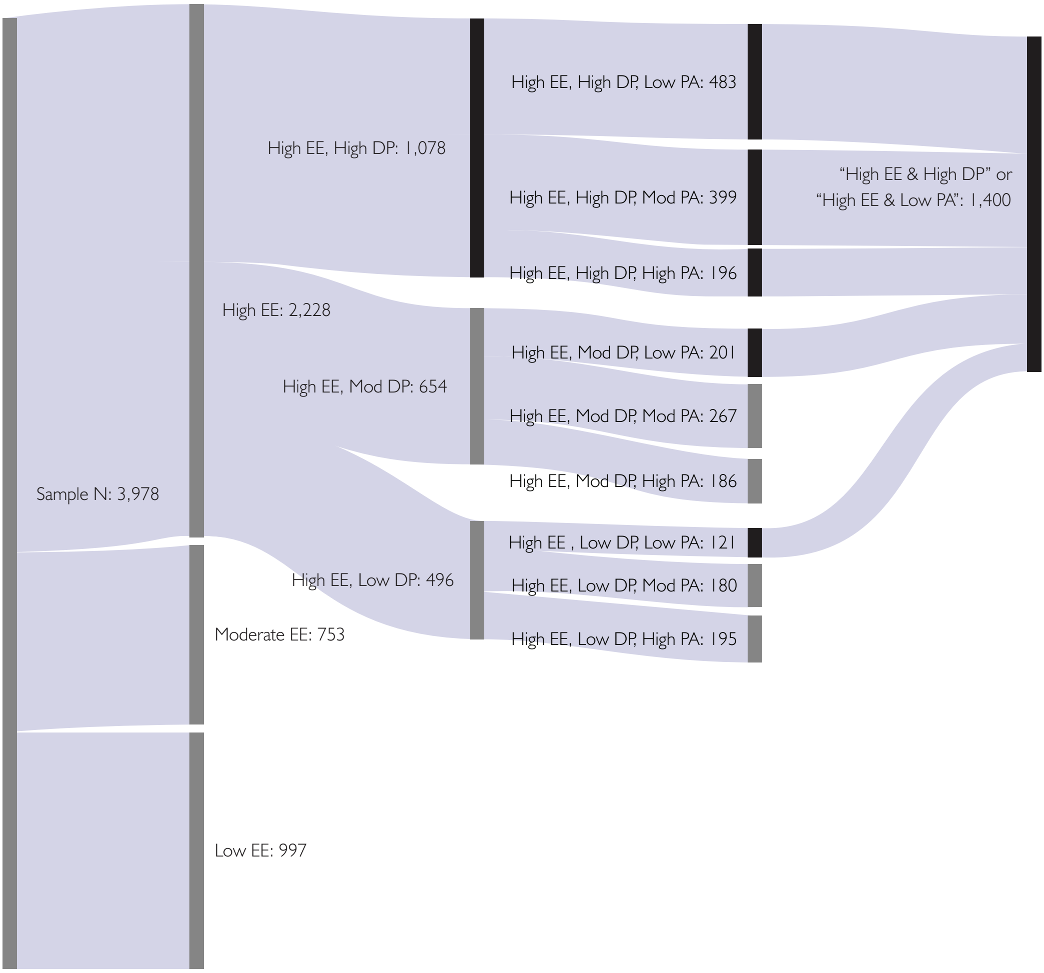

TABLE 2. Descriptive statistics for mental health indicators (N = 3,978)

Mental health indicators	*N*	Percentage	*M*	*SD*	Range
Depression (PHQ-9)			7.6	5.9	0-27
No depression	1,497	37.6			
Mild depression	1,228	30.9			
Moderate depression	674	16.9			
Moderately severe depression	387	9.7			
Severe depression	192	4.8			
Anxiety (GAD-7)			7.1	5.5	0-21
No anxiety	1,470	37.0			
Mild anxiety	1,368	34.4			
Moderate anxiety	650	16.3			
Severe anxiety	490	12.3			
PTSD (PTSS-14)			45.0	18.2	14-98
Under cutoff	2,050	51.5			
Meets or exceeds cutoff	1,928	48.5			
Emotional exhaustion (MBI-HHS)			28.4	12.9	0-54
Low EE	997	25.1			
Moderate EE	753	18.9			
High EE	2,228	56.0			
Depersonalization (MBI-HHS)			9.2	6.9	0-30
Low DP	1,702	42.8			
Moderate DP	1,056	26.5			
High DP	1,220	30.7			
Personal accomplishment (MBI-HHS)			34.3	7.9	0-48
Low PA	1,274	32.0			
Moderate PA	1,380	34.7			
High PA	1,324	33.3			

Table 3 summarizes the results of the LPAs for four to seven profiles. AIC and BIC values decreased with additional profiles. Bootstrapped likelihood ratio test maintained the same level of significance across all four analyses. LMR was significant from five to seven profiles. Entropy was acceptable at four or five profiles and decreased at six and seven profiles. The model with five profiles was selected because it aligned with the results of Leiter and Maslach (2016), and it had a significant LMR and the highest level of entropy, and the smallest profile was at 3%.

The burnout profile had the most negative combination of subscale means, having the highest EE, the highest DP and low PA scores accounting for 9% of the respondents (Table 4); the engaged profile had the most positive combination with low EE, the lowest DP and the highest PA scores relative to the entire sample (35%). Three intermediate profiles were also replicated: the disengaged profile was characterized by higher DP and EE and moderate scores on PA (24%); the overextended profile had moderate scores on EE, DP and PA (30%); and the ineffective profile had the lowest EE, low DP and the lowest PA scores (3%).

TABLE 3. The LPA fit indices for various models of burnout profile ($N = 3{,}978$)

Model	AIC	SSA-BIC	LMR *p*	BLRT *p*	Entropy	Smallest profile *N*
Four	35,971.55	36,027.55	0.220	0.001	0.78	138 (3%)
Five	35,691.21	35,759.66	0.018	0.001	0.78	105 (3%)
Six	35,505.97	35,586.85	0.001	0.001	0.75	121 (2%)
Seven	35,438.50	35,531.83	0.001	0.001	0.73	114 (1%)

$N = 235$

AIC = Akaike Information Criterion; BLRT = Bootstrapped Likelihood Ratio Test; LMR = Lo-Mendell-Rubin adjusted Likelihood Ratio; SSA-BIC = sample size adjusted Bayesian information criterion.

TABLE 4. The descriptive statistics for the five-profile model of burnout ($N = 3{,}978$)

	Standardized mean scores				
	Burnout	**Disengaged**	**Overextended**	**Ineffective**	**Engaged**
Exhaustion	1.25	0.67	0.17	-1.34	-0.84
Depersonalization	2.03	0.88	-0.12	-0.89	-0.96
Accomplishment	-0.58	-0.24	-0.05	-2.39	0.54
N of participants	345	971	1,184	105	1,373
Percent of sample	9%	24%	30%	3%	35%

Discussion

The findings raised concerns about BC nurses' mental health. About one third of nurses in our sample showed signs of depression and anxiety; about half met the criteria for PTSD. According to burnout cutoff scores, about 35% of nurses in this study met the criteria for clinical burnout, and based on the profile approach, about two third reported problems with one or more dimensions of burnout. These findings suggested a higher prevalence of mental health problems among this sample of BC nurses compared to their national and international peers. Specifically, depression, PTSD, and burnout were found to be about 1.5 to 3 times more prevalent among the study sample compared to the national nursing workforce (CFNU 2017; Poghosyan et al. 2010; Shields and Wilkins 2006). Our data also pointed to a worsening trend in BC nurses' mental health across a five-year span (MacPhee et al. 2015). Moreover, this study suggested that compared to the general nursing workforce both nationally and internationally, BC nurses are in a poorer state of mental health (Gradus 2018; Karam et al. 2014; Ritchie and Roser 2018). Given the study results, we are concerned about the health and well-being of BC nurses and their ability to effectively care for those in need of their services.

Workplace risk factors

Workplace risk factors are an important predictor of nurses' mental health problems. As such, in 2013, the Mental Health Commission of Canada created a national standard for "Psychological Health and Safety in the Workplace (the Standard)" that includes 13 workplace risk factors associated with compromised employee mental health and safety (MHCC 2013). In 2016, the BC Nurses Union became the first and only Canadian union to negotiate the Standard into its collective agreement with the BC government, requiring the health authorities to implement the Standard (BCNU 2020). The implementation of the Standard should begin with an assessment of nurses' workplace risk factors as identified in the Standard (MHCC 2013). Finally, in 2019, we obtained province-wide data to evaluate the conditions of nurses' workplaces (Havaei et al. 2021). To date, our preliminary findings have determined that over half of acute care nurses are concerned about 9 of the 13 workplace risk factors (Havaei et al. 2021). Most importantly, about 70% of participants perceived poor psychological protection and ineffective workload management as serious or significant concerns to their mental health and safety (blinded). The former is characterized by unreasonable amounts of work or inadequate resources and the latter refers to the prevention and management of workplace violence or other psychologically harmful incidents (Guarding Minds at Work 2020).

Although work is under way to gain a better understanding of specific workplace risk factors most predictive of nurses' mental health problems, our previous results are consistent with a plethora of previous research and point to serious shortcomings in nurses' work environments and associated mental health implications (Havaei et al. 2021). Workplace interventions and policies should be used as risk mitigation strategies or preventative measures (Guarding Minds at Work 2020). As such, there is an urgent need for the negotiated implementation of the Standard across all BC health authorities. To do that, the first step would be an evaluation of nursing workplace risk factors. We advocate for policies mandating routine evaluation of nurses' workplaces using a systematic, transparent and collaborative approach involving researchers, policy makers, employers, unions and, most importantly, practitioners. Until those policies are in place, nurse managers and leaders can proactively assess and modify workplace conditions that negatively impact the mental health and well-being of their nursing staff.

Similarly, we recommend routine but confidential assessment of nurses' mental health, not only for benchmarking purposes but also for designing workplace-specific policies and interventions. For example, while workplaces with a dominant overextended nurse profile should focus on more effective workload management, workplaces with a dominant ineffective profile should invest in organizational support and relationship building (Mind Garden 2019). The profile analysis found that only one third of nurses were in the engaged profile with work situations that inspired energy, involvement and efficacy. In contrast, the overextended, disengaged and burnout profiles together had 63% of nurses reporting very high levels of exhaustion, indicating unsustainable imbalances of demands over resources. These situations call for nurse leaders and managers to find more effective ways of workload management in their work unit. The bottom line is that while improving mental health in the workplace requires a multi-factorial and multi-level approach (WHO 2021), a good step forward would be data-driven policies and practices focused on cultivating healthy nursing workplaces. This is especially important in the context of nursing care during a stressful and unprecedented pandemic.

Support our nurses

In addition to preventative measures, there needs to be support for nurses living with these mental health problems, especially in light of the COVID-19 pandemic. In BC, nurses have access to treatment programs such as the Employer and Family Assistance Program (EFAP), a confidential counselling service offered by the regional health authorities (Morneau Shepell 2013). Although EFAP is an effective mental health treatment program, access is limited to three to four visits for each mental health problem (Morneau Shepell 2013). Health policies that enable more flexible access in an environment free of stigma would be beneficial to nursing professionals. In 2019, the BC government extended the presumptive legislation to include nurses and other public safety personnel, giving them more access to services and compensation for treating mental illnesses such as PTSD (BCNU 2019). While this is commendable progress, presumption should be extended to all work-related mental health problems, including burnout. Finally, given the concerning rates found in this study, there is an urgent need for a culture shift to better protect and promote the mental health and safety of nurses in the workplace, and we believe that healthcare managers and leaders can play an integral role in motivating this shift. We believe that without healthy nurses, patient care will suffer.

Limitations

This is the first province-wide study that established a baseline of mental health among nearly 4,000 nurses across the province. However, the study findings should be interpreted in light of its limitations. First, even though a high response rate does not ensure representation and vice versa (MacDonald et al. 2009), the generalizability of the findings is limited due to low response rate and potential non-response bias. A descriptive comparison of our sample with the provincial nursing workforce demonstrated less than 10% difference with respect to age, gender, professional designation and employment status (Appendix Table A1, available online at longwoodas.com/content/26500) (CIHI 2020). Despite this finding, we recommend cautiously generalizing the findings to other samples and contexts including non-union nurses. Furthermore, the prevalence of mental health problems was likely underestimated. Although all nurses, actively working or on disability leave (data not included here), were invited to participate in the study, it is possible that those most severely impacted by mental health problems did not respond. The resulting underestimation of prevalence was likely further compounded by the stigma associated with disclosing mental health problems. Future research should use more sophisticated sampling and data collection methods to obtain a more accurate prevalence estimation.

Conclusion

Nearly one third of BC nurses in this study suffered from depression and anxiety, half from PTSD and at least one third from burnout. A comparative evaluation of our findings with previous nursing and non-nursing research evidence showed that the BC nursing workforce is one of the highest-risk populations in terms of mental health problems in Canada; this is not surprising, given the workplace risk factors they routinely encounter. While improving the mental health of the nursing workforce requires multi-factorial and multi-level efforts, a good step forward would be evidence-based and workplace-specific policies and interventions to prevent, mitigate and better support nurses at risk.

Acknowledgement

We would like to thank the British Columbia Nurses' Union for their in-kind support of the study and our nursing colleagues for participating in the study.

Funding

This study was funded by the Social Sciences and Humanities Research Council of Canada, ORS #F19-04340.

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RESEARCH PAPER

Putting the Patient First: A Scoping Review of Patient Desires in Canada

Donner la priorité au patient : examen de la portée des souhaits des patients au Canada

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Abstract

Patient-centred care is a key priority for governments, providers and stakeholders, yet little is known about the care preferences of patient groups. We completed a scoping review that yielded 193 articles for analysis. Five health states were used to account for the diversity of possible preferences based on health needs. Five broad themes were identified and expressed differently across the health states, including personalized care, navigation, choice, holistic care and care continuity. Patients' perspectives must be considered to meet the diverse needs of targeted patient groups, which can inform health system planning, quality improvement initiatives and targeting of investments.

Résumé

Les soins axés sur le patient sont une priorité clé pour les gouvernements, les fournisseurs et les intervenants, mais on en sait peu sur les préférences de soins des groupes de patients. Nous avons effectué un examen de la portée dans lequel 193 articles ont été analysés. Cinq états de santé ont été utilisés pour rendre compte de la diversité des préférences possibles en fonction des besoins en santé. Cinq grands thèmes ont été identifiés et exprimés différemment selon l'état de santé : les soins personnalisés, la navigation, le choix, les soins holistiques et la continuité des soins. Le point de vue du patient doit être pris en compte afin de répondre aux divers besoins des groupes ciblés, ce qui peut éclairer la planification du système de santé de même que les initiatives visant l'amélioration des soins ainsi que le ciblage des investissements.

Introduction

Increasingly, policy makers and health system managers are considering the perspectives and experiences of patients in reforming health systems (1–5). The emphasis on "patient-centred care" places patients (and caregivers) at the forefront of the planning, delivery and evaluation of healthcare services (2, 6, 7). The recently established Ontario Minister's Patient and Family Advisory Council (PFAC) is the first of its kind in Canada and provides a formal mechanism for incorporating patient and family perspectives into decision making and system planning (7, 8). The idea of organizing healthcare around the patient seems, at first, uncomplicated, yet the concept itself is complex, and the application of the concept is multifaceted. The Institute of Medicine (IOM) informs much of the discourse and application on this topic (5). In this context, *patient-centred care* refers to "providing care that is respectful of, and responsive to, individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions" (5: p. 3). As described by the IOM, the concept applies not only to care delivery but also to system planning and research (5). It also relates closely to patient experience and engagement (4, 9). Whereas *patient engagement* aims to solicit patient and family input based on their needs and preferences to co-design solutions (4), *patient experience* is defined as "how patients perceive and experience their care" (10).

The effective design and delivery of patient-centred care require a comprehensive understanding of the needs, desires and preferences of patients. Although high-performing health systems identify patient-centred care as a critical health system priority, the healthcare system is often criticized because of its tendency to focus on the needs of healthcare providers, who often do not have a comprehensive understanding of patient needs. Alongside policy makers' increasing interest in patient-centred care is a growing body of scholarly research that aims to understand patient experiences with and their perspectives on the health system. Furthermore, when patient needs are explicitly recognized, the system is designed based on generalized assumptions of these needs, as if patients are a homogeneous group, yielding a "one size fits all" approach. Previous research has suggested that patients' needs vary significantly across different patient populations (6–10), but this research has not yet been systematically reviewed.

The purpose of this study was to gain a systematic understanding of the preferences of Canadian patients and, where possible, their caregivers. This information can be used to inform the design and tailored delivery of healthcare services for different patient and caregiver groups.

Methods

This scoping review follows the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines (11), as well as Arksey and O'Malley's stepwise approach to conducting a scoping review (12).

Search strategy

We used the PICo (population, interest, context) framework for qualitative studies to operationalize the research purpose into searchable keywords (13). Four databases were searched in January 2019 (OVID Medline, CINAHL, EMBASE and PsycInfo). To maximize search results and derive search results that were manageable and focused, we conducted four separate searches within each database involving various combinations of Boolean operators (and/or) for life stage, health stage and population of interest. These searches are listed below:

- Search 1: Patients OR caregivers OR health stage, AND interest AND context
- Search 2: Patients OR caregivers OR social status OR health stage, AND interest AND context
- Search 3: Life stage OR health stage, AND interest AND context
- Search 4: Life stage OR health stage OR social status, AND interest AND context

Appendix 1 (available online at longwoods.com/content/26499) presents the application of Search 1 to OVID Medline. Search restrictions were imposed on language (English), setting (Canada, provinces/territories) and date of publication (January 2013 to December 2019). Pulling articles from 2013 onward was a practical and purposeful decision (12) as we wanted to obtain a manageable number of articles that was reflective of current Canadian opinions of the health system, not a historical understanding of how needs have changed. To ensure a valid and reliable search, this search process was guided by a trained medical sciences librarian.

Study selection

Two reviewers performed a title/abstract screening of all articles following the removal of duplicate articles. The same reviewers then both performed the full-text review on all remaining articles. Articles were included if they met inclusion criteria concerning study setting (Canada and/or a Canadian province), study participants (patients of all ages and/or family/friend/caregiver) and study topic (healthcare experiences).

Data extraction and analysis

To account for the diversity of health needs across the Canadian population, we hypothesized five identifiable health states to organize patient groups, described in Table 1. Health states were initially identified within our interdisciplinary team and were adapted based on the presentation of populations within the literature (8–10, 14, 15). Although other health states could have been used for categorization, the five were generally quite effective and appropriate for describing the health needs found in studies. Studies were organized by health state based on the description of the population included in the study. It is possible that some populations may have fallen across multiple health states. In such cases, two reviewers independently allocated articles to the most appropriate health state, and disagreement was reconciled by the principal investigator. Appendix 2 (available online at longwoods.com/content/26499) provides a tally of how many articles spoke to each health state across a variety of life stages, which include age and other population subgroups (i.e., LGBTQ+ populations).

TABLE 1. Five health state categories and definitions

Health state	Definition
Walking well	Those who use primary preventive and alternative care to maintain health and well-being
Chronic conditions	Those who live with one or more chronic diseases and see more than one provider
Acute life-threatening	Those who seek care in emergency departments or have short intervals in hospitals
Mental/cognitive health and addictions	Those who seek care for mental health issues and/or addictions in any care setting
Palliative/end-of-life care	Those who receive end-of-life support and care in any setting

Two reviewers were responsible for independently extracting data from all articles following a pilot extraction of two articles. The extraction table included details on the study itself (i.e., year, purpose, location, population of interest, methods, key findings, etc.). All key findings were summarized within the extraction table, and representative quotations were pulled from the document. Following completion of the extraction, three researchers systematically reviewed the data, focusing mostly on the summarized key findings, and coded details based on life stage (pediatric, youth and children, young adult, adult and older adult) while colour-coding experiences based on health state, as described above. Following this coding, an inductive thematic analysis was then conducted by three reviewers to summarize findings and themes (16), where the three researchers met to discuss consistent themes across life and health states. As themes and consistent experiences were identified, the researchers looked to identify both the similarities and the differences in desires across health stages.

Results

The PRISMA Flow Diagram (Appendix 3, available online at longwoods.com/content/26499) presents the article selection process. A total of 12,341 studies were pulled across all databases searched; 7,763 and 4,127 articles were excluded following deduplication and title/abstract screening, respectively. Full-text screening was then performed on the remaining 451 studies, and 193 were included for analysis (17–208). Appendix 4 (available online at longwoods.com/content/26499) presents a summary of all included articles, including author(s), year, location and aim. Recognizing that the populations studied may fall within different health states, we include a matrix tally that illustrates the overlap in health states across the studies included (Appendix 2, available online at longwoods.com/content/26499). Additionally, where data were available, the results highlight the perspectives of patients and caregivers. The majority of papers spoke to patient perspectives only, and in those instances we discuss the results and refer only to patients. If caregivers' perspectives were reported in the literature, we reference patients and caregivers together.

Among many possible areas on which to focus health system improvement, there were common preferences expressed across health states (summarized in Table 2) within the included articles. Table 2 demonstrates these reported preferences; if a preference was identified in the literature and associated with a particular health state, there is a check mark. These preferences were generally described to be of equal importance: 1) personalized care; 2) information on resources available and how to navigate the system; 3) choice in treatment, care setting and/or care provider; 4) holistic care and non-medical supports to overcome barriers to accessing care; and 5) care continuity (including care coordination).

TABLE 2. Overview of themes (preferences) across health states

	Health states				
Preference	**Walking well**	**Mental and cognitive health**	**Acute life-threatening**	**Chronic conditions**	**Palliative care**
Personalized care	✓	✓	✓	✓	✓
Information	✓	✓	✓	✓	✓
Choice	✓	✓		✓	✓
Holistic care and non-medical supports	✓	✓	✓	✓	
Coordinated care and continuity of care		✓		✓	✓

The following describes overarching preferences common to two or more health states as presented in the literature. We then explore the subtle nuances between health groups (unique preferences expressed by one health state), which are summarized in Table 3. These themes and the nuances within them have different implications for how the health system could be shaped or reshaped.

Personalized care

Within the literature, across all health states, personalized care was broadly characterized as representing respectful behaviour toward the patient, providing care in a preferred language, healthcare provider (HCP) awareness about the needs of vulnerable populations and delivery of care that considered both social and medical needs (25, 27, 31, 33, 39, 45, 50, 53–55, 57, 62, 68, 69, 74, 77, 79–81, 82, 85, 88, 90, 94, 99, 100, 102, 106–109, 111, 114, 116, 118, 119, 122, 124, 134, 135, 136, 141, 142, 147, 150, 154, 156, 158, 163, 165, 169, 172, 174, 176, 179, 184, 192, 193, 195–204, 208, 209). Consistent within the reviewed literature, patients and caregivers identified a preference for care that was holistic, individualized and culturally competent (19, 28, 53, 69, 74, 76, 80, 94, 99, 100, 102, 107, 108, 116, 121, 122, 124, 129, 132, 134, 135, 156, 162, 168, 176, 178, 180, 195, 197, 201, 208). Since care avoidance was often attributed to a fear of being stigmatized or judged, patients saw value in HCPs receiving diversity training.

Although holistic, individualized and culturally safe care was a common preference across all health states, respecting linguistic needs, such as a provider who speaks the patient's language or availability of interpretation services, was particularly important to the walking well group (53, 69, 74, 94, 99, 100, 102, 107, 108, 116, 122, 124, 134, 135, 156, 176, 195, 197, 201, 208).

Information

In the reviewed literature, all the health states expressed a preference for information from their HCP concerning resources available outside hospital walls (17, 21, 27, 31, 61, 64, 65, 70, 75, 87, 89, 92, 103, 110, 117, 121, 129, 139, 158, 163, 166, 167, 171, 173, 175, 178, 183).

Although the preference for information was evident across all the health states, the specific information needs differed between the groups. For example, the walking well group was interested in information on funding resources (117, 121, 129, 178). The acute life-threatening and chronic conditions groups were both interested in knowing the next steps after leaving the hospital (21, 22, 31, 50, 61, 64, 65, 70, 75, 87, 89, 92, 103, 110, 123, 130, 139, 154, 158, 163, 166, 167, 171, 175, 183, 196, 204). However, the chronic conditions group wanted to know about care plans and community resources given their prolonged trajectory of illness (21, 31, 50, 61, 64, 65, 70, 75, 87, 89, 92, 103, 106, 123, 139, 158, 163, 166, 167, 171, 175, 183). The walking well patient group and the mental health and addictions patient group noted the preference for online resources that would support improved self-management of health opportunities (23, 24, 28, 76, 96, 102, 124, 128, 168). The walking well and palliative care groups wanted information regarding illness prognosis and treatment outcomes (e.g., drug side effects) in order to make informed decisions. Whether a decision was less sensitive (e.g., the decision to get screened for a medical condition or to receive a vaccination) or more sensitive (e.g., decision making around end-of-life care) did not obviate the need for comprehensive information (17, 23, 24, 27, 28, 76, 96, 102, 124, 128, 168, 173).

Choice

Choice was preferred in four of the five health states in the reviewed papers. Groups who have a more prolonged course of illness (mental health and addiction, chronic disease and palliative care) wished to have choice in areas related to the involvement of their caregivers and in which setting to receive care (25, 27, 30, 31, 42, 82, 89, 92, 110, 112, 119, 150, 153, 160, 163, 166, 169–171, 181, 185, 186, 194, 198, 200).

Choice of HCP and choice of setting for the care services were particularly important for the walking well group (19, 24, 32, 41, 46, 59, 94, 104, 113, 115, 117, 125, 128, 132, 138, 140, 145, 149, 156, 161, 177, 195, 201, 206, 207). However, this was not the case in the acute life-threatening group, which likely relates to the short-term relationship that a patient often has with hospital-based providers. Patient groups with prolonged disease trajectories (i.e., chronic conditions and mental and cognitive health issues) wanted their caregivers to be partners in their care (39, 42, 43, 72, 119, 163, 170, 171, 185, 186, 189, 194, 202, 209).

Holistic care and non-medical supports

These supports were preferred to overcome barriers to accessing care among the walking well; those with chronic conditions; those with mental, cognitive and addiction-related issues; and those with acute life-threatening illnesses (19, 28, 39, 55, 72, 76, 90, 94, 99, 116, 121, 124, 129, 132, 134, 147, 150, 154, 168, 169, 172, 178, 195, 198, 200, 201, 208). The relationship between HCPs and patients was important across all of these health states. Interactions with HCPs were described positively in many cases, representing the trust that patients (particularly older patients) and caregivers placed within their HCPs. However, patients wanted HCPs to be more respectful of patient needs and treatment preferences; offer non-judgmental care; communicate in ways that patients and caregivers can understand; allow more time during patient interactions to listen to patients; treat and consider social needs; and help them navigate the healthcare system (discussing next steps, available resources and treatment options).

In terms of variations across patient groups, for the walking well group, holistic care meant being able to access non-Western approaches to healthcare free of financial barriers, including traditional Chinese medicine (28, 74, 76, 94, 99, 116, 121, 124, 129, 132, 162, 168, 178, 195, 201, 208). For the mental and cognitive health groups, holistic care specifically meant being able to access spiritual and culture-based services (39, 55, 72, 90, 147, 150, 169, 172, 189, 198, 200).

Coordinated, continuous care

Coordinated, continuous care represents an uninterrupted relationship with the same primary care provider. This is particularly significant given their critical role as gatekeepers and the first point of contact in the health system. This preference was expressed by all three health states, where patients live with multiple conditions or receive care from multiple providers (chronic conditions, palliative care and mental and cognitive health groups) (25, 27, 34, 43, 45, 65, 72, 75, 83, 123, 126, 152, 157, 163, 166, 169, 181, 185, 189, 198, 202). For the two groups who often receive care from more than one HCP – chronic conditions and mental health and addictions – coordinated transitions across various care settings were deemed vital (25, 34, 42, 43, 45, 65, 72, 141, 148, 157, 169, 189, 198, 202).

For the mental and cognitive health group, coordination of services while transitioning from youth to adult care services was important given the early onset and long-term nature of diseases affecting this group (126, 152). For the chronic conditions group, coordinated flow of information among providers and receiving care from interdisciplinary teams was crucial (21, 42, 148, 159, 169, 170, 181). For the palliative care group, there was a strong preference for both an ongoing relationship with their providers and having the same provider until the end of life (17, 26, 27).

TABLE 3. Differences in patient group stated preferences, by health state

	Preferences				
Health state	**Personalized care**	**Information**	**Choice**	**Holistic care and non-medical supports**	**Coordinated, continuous care**
Walking well	Availability of interpretation and translation service	Clear presentation of funding and insurance options	Choice in the type of provider Choice in healthcare setting	Access to non-Western medicine approaches	
Mental and cognitive health		Access to HCPs who are aware of mental health resources, offer early dissemination of counselling information and understanding of disease trajectory	Include caregivers as partners in care	Exposure to spiritual care	Support transitions from youth to adult services
Acute life-threatening		Information on discharge procedures, care plans and disease trajectory			
Chronic conditions		Support with filling out complicated forms Understanding of discharge procedures and care plans Improved channels to access personal health information	Include caregivers as partners in care		Continuity in information and understanding between providers Access to interdisciplinary teams
Palliative care		Information around possible complications Support with filling out complicated forms			Continuous and ongoing relationships with HCPs, particularly when transitioning from acute to palliative and end-of-life care

As presented in Table 3, there were some nuances in how patient groups perceived the five common preferences across the different health states in the reviewed papers. Although holistic, individualized and culturally safe care was a common preference across all health states, respecting language preferences and needs was of particular importance for the walking well group (53, 69, 74, 94, 99, 100, 102, 107, 108, 116, 122, 124, 134, 135, 156, 176, 195, 197, 201, 208). Access to information was expressed differently across health states. For example, the walking well group was interested in understanding the availability of funding (28, 76, 121, 132, 168, 195, 201) whereas the chronic conditions group was more interested in having access to their health information and community resources (21, 31, 61, 64, 65, 70, 75, 87, 89, 92, 103, 110, 123, 139, 158, 163, 166, 167, 171, 175, 183). The ability to choose their provider and healthcare settings was notable for the walking well group (24, 46, 113, 149, 207). Those with a chronic condition or mental health illness noted that they preferred the choice to engage their caregivers as partners in care. For the walking well and mental and cognitive health groups, holistic care was about accessing care that goes beyond traditional medical services to spiritual and culture-based services (28, 74, 76, 94, 99, 116, 121, 124, 129, 132, 162, 168, 178, 195, 201, 208). For the mental and cognitive health groups, coordination of services meant smooth transitions from youth to adult services (126, 152). For the chronic conditions group, coordinated flow of information among providers and receiving care from interdisciplinary teams were important (21, 42, 148, 159, 169, 170, 181). For the palliative care group, this meant having ongoing relationships with the same provider until the end (27).

Interpretation

Recognizing the diversity of experiences, values and expectations that reflect the broader health and socio-demographic profile of Canadians, a comprehensive understanding of the current needs of patients and their caregivers is needed to better inform tailored, patient-oriented and equitable approaches to health system design and health service delivery. Although patient-centred care is ultimately an individual concern, this review reveals five broad preferences across a wide range of patient groups, which we have further subcategorized as five distinct health states. Even with similarities across health states, the way these preferences and needs were expressed and the examples of changes to healthcare systems that were suggested differed across these groups. These differences have implications for provincial and territorial as well as more local (based on geography or defined population) health systems in Canada in terms of how they should be shaped or reshaped.

Past research eliciting the views of healthcare users has largely focused on the needs and experiences of disease-specific groups – for example, those with diabetes (105, 106, 153). Much of the healthcare system, however, is not organized around disease-specific groups, as clearly illustrated in the case of primary care. This review has shown that needs can be organized around health states and that disease state does have an impact on care preferences.

Provincial governments in Canada are initiating a number of changes to achieve more integrated and coordinated care. With the consolidation of all the province's health regions into a single province-wide health authority (Alberta Health Services) in 2008 and, more recently, the introduction of Primary Care Networks, the Government of Alberta has tried to better coordinate care through aligning governance structures. British Columbia is working toward patient medical home and primary care network models to improve the needs of patients by linking integrated systems of care between health professionals, networks and coordinated specialty services within the community. Similarly, Manitoba's creation of "shared health" is an attempt to centralize services and offer an integrated clinical services plan. In Ontario, this has manifested as Ontario Health Teams (OHTs). It is hoped that OHTs will coordinate care at an organizational level (shared governance, shared medical information and streamlined approaches to funding, with local regions' spending autonomy based on patient demographics and regional needs). However, the degree to which these efforts align with patient desires, as well as how all of these approaches will consider patients' needs and preferences in health service delivery, remains unknown. The results from our study align with notions of integration proposed by Singer et al. who view integrated care as a concept that should be built around the patient and as composed of two pillars: coordinated care across time and between settings (which OHTs aim to address) and patient- or person-centredness (210). The latter is where the results from our study are particularly relevant in the ongoing evolution of health systems to be integrated. Additionally, with the effort to achieve Quadruple Aim outcomes to improve patient/caregiver experience, population health and provider experience and to maintain per capita costs, this research becomes increasingly relevant to inform evaluative efforts to ensure that measurements are capturing the identified desires of patients and caregivers depending on the priority population.

Patient-centred care improves health outcomes and is instrumental to addressing racial, ethnic and other healthcare inequities. We identified four areas where this work could be used to inform the development, implementation and evaluation of integration efforts across Canada. This includes how patients, specifically members of each of the different health states, should be *engaged in planning and improvement efforts*. Additionally, depending on the targeted priority population, these findings could help inform which partners and/or care providers should be considered part of the integrated care team (i.e., having caregivers included as part of the care team for those living with chronic conditions) and support *public and patient involvement*. As Canadian jurisdictions transition toward more integrated health systems, they will require measurement and evaluation plans. These findings will inform the development of *quality improvement plans* and the construction of *meaningful outcome measures* that consider the differences and needs between and among health states (i.e., access to transparent information with treatment plans for individuals living with acute life-threatening illnesses). Finally, *targeted investments* to improve the system must consider the potential magnitude of any benefits given that different patient populations will benefit to different degrees (i.e., directing resources toward online information for individuals living with mental health illnesses).

Limitations

First, the experiences with and perspectives on the health system presented in this review do not necessarily represent a full or comprehensive characterization of people who could fall within the respective health states. Relatedly, we recognize that patient populations may fall into multiple health states. This reinforces complexities in addressing gaps in health service delivery, particularly for Canadians living with multiple morbidities. Second, our characterization of health states was based on the literature, but other groupings or subgroupings would likely identify further distinctions. However, the hypothesized categorization comprehensively described the identified literature, with few exceptions. Third, much of the literature was reflective of patients and caregivers living in urban settings, with few studies focusing on the perspectives of patients and caregivers living in rural and/or remote locations of Canada. The collective literature was also relatively less reflective of certain social groups, including racialized populations, non-English-speaking communities, the unemployed or underemployed and persons living across the income and education spectrum. This underrepresentation makes it challenging to discern how health inequities may impact patient and caregiver desires of the health system. Finally, given the heterogeneity of study types, we could not make any assertions on the relative importance of one desire over another. Instead, the desires captured in this study are a composite of those most commonly expressed across all studies.

Conclusion

There were similarities in desires expressed across health states. However, the way these preferences and desires were expressed, and the examples of how to adapt health systems, varied across health states. If the healthcare system is going to be truly patient-centred, then one size does not fit all. The patient groups in our study – the walking well, those with mental and cognitive health challenges, those with life-threatening or more chronic conditions and those needing palliative care in the final stages of life – have varying preferences for and different perspectives on personalized care, health system information, choice, non-medical supports and the coordination and continuity of care. These findings can be used to inform patient-centred integrated care efforts on how the health system can be shaped or reshaped for identifiable patient groups. We highlight four particular ways this could work to support the development, implementation and evaluation of integration efforts. First, the results can support policy and practice planning by offering an improved understanding of the preferences of a variety of potential target populations; they could also, depending on the priority population, inform as to which partners should be included as part of the care team. Second, central to the effective development of patient-centred models is the meaningful engagement of patients, and these results provide some insight into differing experiences of patients based on their health state. Third, the results of this scoping review could be used to inform quality improvement efforts and evaluation strategies that reflect the desires of patients and caregivers. Finally, these results can inform the worthwhile targeting of investments, highlighting areas that are relevant and important for a variety of priority populations.

Funding

This research was funded by the Ontario Medical Association.

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RESEARCH PAPER

Despite Interventions, Emergency Flow Stagnates in Urban Western Canada

Malgré les interventions, le flux des patients aux urgences stagne dans l'Ouest urbain du Canada

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Abstract

Purpose: This paper reports the quantitative component of a mixed-methods study of patient flow in the 10 urban health regions/zones of Western Canada. We assessed whether jurisdictions differed meaningfully in their emergency flow performance, defined as mean emergency department length of stay (ED LOS).

Methods: We used hierarchical linear modelling to compare ED LOS across jurisdictions, based on nationally reported data for 2017 to 2018. We also explored 36-month performance trends. Admitted and discharged patients were analyzed separately.

Results: With the exception of one high performer, no region's performance differed significantly from average for both admitted and discharged patients. The regions' levels of performance remained largely static throughout the study period.

Conclusions: Results precluded any mixed-methods comparison of high- and low-performing regions. However, they converged with our qualitative findings, which suggested that most regions were pursuing similar flow-improvement strategies with limited effectiveness. Deeper changes may be required to address persistent misalignment between capacity and demand.

Résumé

Objectif : Cet article présente le volet quantitatif d'une étude à méthodes mixtes portant sur le flux des patients dans les 10 régions sanitaires urbaines de l'Ouest canadien. Nous avons cherché à savoir s'il y avait des différences significatives dans le rendement du flux des patients aux urgences entre les régions, notion définie comme la durée moyenne de séjour au service des urgences (DDS).

Méthode : Nous avons utilisé une modélisation linéaire hiérarchique afin de comparer la DDS entre les régions, selon les données à l'échelle nationale de 2017 et 2018. Nous avons également étudié les tendances du rendement sur 36 mois. Les admissions et sorties des patients ont été analysées séparément.

Résultats : À l'exception d'une région très performante, la performance des régions ne différait pas significativement de la moyenne pour les patients admis et sortis. Les niveaux de performance des régions sont restés principalement les mêmes tout au long de la période à l'étude.

Conclusion : Les résultats ne permettent pas une comparaison de méthodes mixtes entre les régions à rendement élevé et celles où il est faible. Cependant, les résultats concordent avec nos résultats qualitatifs, qui suggèrent que la plupart des régions poursuivent des stratégies similaires d'amélioration des flux, dont l'efficacité est limitée. Des changements plus en profondeur pourraient s'avérer nécessaires pour remédier au désalignement persistant entre la capacité et la demande.

Introduction

Health systems across Canada have invested considerable effort in alleviating emergency department (ED) crowding and improving patient flow. Numerous initiatives have been implemented that variously address ED input, throughput, output and system-wide factors (Asplin et al. 2003; de Grood et al. 2012). Despite this, Canada continues to fall far short of benchmarks for ED flow performance and recently ranked last in an 11-country comparison of ED wait times (CIHI 2017, 2019). International comparison has offered valuable insight on other countries' contrasting approaches; however, strategies adopted from dissimilar health systems may not prove effective or feasible in Canada (Pines et al. 2011). Accordingly, we set out to assess performance variation among Western Canadian jurisdictions, seeking to glean locally applicable lessons through comparison of high- and low-performing systems.

Whereas an effective system-level response to flow challenges demands more than a mere collection of interventions, most of the literature on potential solutions is focused on specific initiatives (de Freitas et al. 2018; Morley et al. 2018). Literature at the system level is sparse and largely restricted to single-case studies (Kreindler 2017; MacIntosh-Murray et al. 2010) or evaluations of system-wide initiatives, such as pay for performance or Lean (Cheng and Sutherland 2013; Vermeulen et al. 2016). A recent comparative study of American hospitals pointed to the importance of general leadership factors such as executive involvement, data-driven management and performance accountability (Chang et al. 2018). Neither has there been a similar Canadian study, nor one examining multi-hospital systems such as regional health authorities.

This paper reports the quantitative component of a mixed-methods comparative case study of patient flow in urban Western Canada: the Western Canadian patient flow (WeCanFlow) study. The study's intent was to compare jurisdictions on their ED flow performance (quantitative), explore each jurisdiction's flow strategies and context (qualitative) and integrate the findings in order to determine what distinguished high performers from low performers.

The study encompassed all 10 Western regions/zones (hereafter "regions") whose population was at least two thirds urban. At the time of the study, all Western provinces operated under a regionalized or quasi-regionalized model, with flow strategies under the control of regions (Manitoba [MB], Saskatchewan [SK], British Columbia [BC]) and zones (Alberta [AB]). The participating regions were already collaborating through the Western Canada Healthcare CEO Forum and its associated patient flow collaborative – these bodies were partners in designing the study. Decision makers from each region, and from some provincial organizations and Accreditation Canada, were included in the study team.

The qualitative component featured in-depth interviews with 300 managers who had strategic or operational responsibility for flow. Interviews, conducted during a site visit to each region (spring 2016 to winter 2018), sought to furnish a deep understanding of the prevailing approach to patient flow by probing four domains: flow strategies, system design, selection (decision-making) processes and social context. The aim was not to produce a complete inventory of strategies, but rather to explore explanations for perceived success or failure and to identify broader organizational factors that might underpin performance. The qualitative findings were too extensive to be reported in a single article and have instead been developed into separate articles on common strategies and challenges (Anwar et al. 2021; Kreindler et al. 2020, 2021a, 2021b, 2021c).

The planned mixed-methods comparison was predicated on the detection of reliable and meaningful inter-regional differences in ED flow performance. Accordingly, the quantitative component was focused on ascertaining whether the regions' levels of performance truly differed.

Method

Analyses were based on administrative data, drawn from the National Ambulatory Care Reporting System (NACRS) and provided by the Canadian Institute for Health Information (CIHI) for fiscal years (FY) 2015–16, 2016–17 and 2017–18. NACRS coverage varies by province: Alberta mandates that all hospitals report their data, whereas in the participating regions from other provinces, nearly all teaching and large community hospitals report their data, but fewer medium and only a minority of small hospitals do so. We excluded small hospitals from the analysis, not merely because of the unrepresentative nature of the sample thereof, but principally because (according to decision makers on the project team) the flow challenges confronted by smaller and larger hospitals are qualitatively different – the former's challenges revolve around physician coverage and resource availability in rural areas, and the latter's around efficiency and organization. An inter-regional comparison that conflated the two would not be as meaningful. Also excluded were facilities admitting 0 to 10 patients per year; these facilities may be better defined as urgent care centres than EDs and may also face qualitatively different flow challenges. The sample included 7,014,642 visits to 48 EDs in 10 regions with patient and hospital characteristics presented in Table 1, available online at longwoods.com/content/26498.

There are several possible indicators of ED flow, and most revolve around length of stay (LOS), measuring either the average, median, 90th percentile or proportion of patients exceeding a certain benchmark. We consider the average to be the most informative because, unlike quantiles or benchmarks, it produces a single metric that reflects actual person-hours of ED utilization (e.g., it takes into account whether a long-stay patient occupies a bed for 20, 40 or 60 hours, which has a direct bearing on ED crowding). Moreover, unlike benchmarks, it is robust to distortions that may arise when staff attempt to discharge patients immediately prior to a target time (Mason et al. 2012). Non-LOS-related metrics (e.g., number of patients waiting for a bed at 8 a.m.) are not consistently collected across regions. Thus, we defined the outcome as average ED LOS. As the distribution of ED LOS is typically skewed, with a tail of increasingly long stays, LOS was log-transformed to create a normally distributed variable. However, because log-transformed average values are not readily interpretable, we present raw median and 90th percentile metrics in Table 2.

In keeping with standard practice, the average LOS was assessed separately for admitted and discharged patients and calculated according to the CIHI definition appropriate to each group. According to this definition, LOS begins at the point of registration or triage (whichever is earlier) and ends when the patient leaves the ED (admitted patients) or receives a disposition (non-admitted patients). For 0.1% of the admitted and 3.4% of the discharged patients, the preferred end marker was unavailable, so the non-preferred marker was used instead. Patients who left the ED prior to treatment or disposition, died before/after arrival or were transferred to another facility were not included in either group; these types of non-admitted patients tend to have relatively short stays, and it did not seem appropriate to give a region "credit" for these short stays.

TABLE 2. ED LOS quantiles for FY 2017–18

Urban Health Regions/Zones	ED LOS (h)			
	Discharged		Admitted	
	Median	90th percentile	Median	90th percentile
Vancouver Coastal Health, BC	3.00	6.93	9.27	26.87
Island Health, BC	2.82	5.75	9.83	28.52
Fraser Health, BC	3.10	6.58	16.02	49.57
Interior Health, BC	2.73	5.75	12.43	43.18
AHS Calgary Zone, AB	4.05	8.00	11.32	30.68
AHS Edmonton Zone, AB	4.43	9.87	13.49	44.08
AHS South Zone, AB	2.55	5.35	6.77	17.37
Saskatoon Health Region, SK	3.73	7.97	10.73	38.00
Regina Qu'Appelle Health Region, SK	4.48	9.17	9.92	26.83
Winnipeg Health Region, MB	4.12	10.22	12.82	33.93
N	1,855,636		374,051	

N excludes 147 discharged patients and 49 admitted patients with missing data.

The main analysis was a cross-sectional comparison based on the most recent year of data (FY 2017–18) and conducted using SAS 9.4. To ensure an objective and meaningful comparison, we made several *a priori* decisions about the analysis and its interpretation.

First, we recognized that apparent differences in the regions' performance may reflect differences in the types of patients they serve. Other than admission status, which is by far the strongest patient-level predictor of ED LOS, patient characteristics that have shown an association with LOS include arrival by ambulance, age, Canadian Triage Acuity Scale (CTAS) level, health condition(s) and (in a minority of studies) sex (Kreindler et al. 2016). All hospitals that participate in NACRS report patients' mode of arrival, age, CTAS level and sex, although the data set does not include comparable information on health conditions. Patient characteristics can affect LOS at both the individual level (e.g., older patients tend to stay longer) and the collective level (e.g., an ED serving mostly elderly patients may become bogged down, resulting in longer LOS for everyone). Accordingly, we used hierarchical linear modelling to test for significant differences in the regions' performance after separating out both measured and unmeasured variation associated with their patient populations.

A hierarchical analysis of ED LOS could be conceived as either two-level (patients nested in regions) or three-level (patients nested in hospitals nested in regions). The appropriateness of including the hospital level depends on one's assumptions about region–hospital relationships. If regions have a major influence on their constituent hospitals and may designate different hospitals to serve different roles, then hospital-level variation is at least partly attributable to regional-level strategy, and removing it from the comparison of regions would seem unfair. On the other hand, if hospitals actually manage flow individually, with little regional oversight, then it would be unfair *not* to separate out the hospital level. Because our focus was regional, we were most concerned with avoiding underestimating the regional-level effect; accordingly, our primary analysis was two-level. However, we also computed a three-level model to determine how much of the variation in regional performance was a function of variation among specific hospitals.

Finally, to avoid the risk of overinterpreting small inter-regional differences that might be attributable to chance variation or are of little practical importance, we established two criteria for designating a region as a high or low performer. First, the region's performance must differ significantly from average, with statistical significance defined at a threshold appropriate for multiple comparisons (alpha = 0.005; Ioannidis 2018). Second, this must hold for both discharged and admitted patients. This is not to imply that discharged and admitted patient LOS "should" be strongly associated; we recognize that the two may have different determinants (e.g., the availability of in-patient beds might influence only admitted patients' LOS). However, our interest was in regional performance as a global construct, not merely for a subset of ED patients. It would not make sense to hold up as an exemplar a region whose performance is significantly above average on one ED metric but below average on the other. We did not attempt to judge the clinical or administrative significance of observed performance differences, only their statistical significance and consistency.

In addition to comparing performance cross-sectionally, we explored trends in ED LOS over a 36-month period (FY 2015–16 through 2017–18) to see whether any regions appeared to be high/low improvers. As we could not prespecify hypotheses about when and where performance might change, we did not apply tests of statistical significance.

This study was approved by the University of Manitoba Health Research Ethics Board.

Results

Only one jurisdiction met the criterion of performing significantly better or worse on both admitted and discharged ED LOS: Alberta Health Services (AHS) South Zone, AB, which was the high performer on both metrics (Table 3). In three additional jurisdictions, results for both metrics were on the same side of the average: better in the case of Island Health, BC, and worse in the case of AHS Edmonton Zone, AB and the Winnipeg Health Region, MB. In these three cases, however, the comparison reached significance only for discharged patients. The remaining six regions' results were inconsistent across the two metrics or wholly nonsignificant. Thus, the data offered no basis for designating subgroups of regions as high and low performers.

We note that owing to the logistics of scheduling site visits, some regions had their qualitative interviews in 2017–18 and others in 2016–17. To facilitate the mixed-methods analysis, we reran the above models using data from (a) 2016–17 and (b) the year during which interviews were conducted in the region of interest. The pattern of results was highly similar across years, save that in 2016–17 the Winnipeg Health Region scored significantly worse than average on both metrics.

TABLE 3. Hierarchical linear models of ED LOS (log-transformed) for FY 2017–18

	Patients			
Model statistics	**Discharged**		**Admitted**	
Intercept (Region)	0.04502 (p = 0.0168)		0.04901 (p = 0.0170)	
Residual	0.4932		0.7077	
−2 Res Log Likelihood	3,954,366		932,287.6	
AIC	3,954,370		932,291.6	
Effects by region	Estimate	p	Estimate	p
Vancouver Coastal Health, BC	-0.0923	0.1690	-0.1215	0.0856
Island Health, BC	-0.2037	0.0024	-0.0694	0.3226
Fraser Health, BC	-0.1086	0.1057	0.3104	<0.0001
Interior Health, BC	-0.2319	0.0006	0.1623	0.0208
AHS Calgary Zone, AB	0.1876	0.0052	0.0414	0.5549
AHS Edmonton Zone, AB	0.2604	0.0001	0.1910	0.0064
AHS South Zone, AB	-0.3036	<0.0001	-0.4809	<0.0001
Saskatoon Health Region, SK	0.0664	0.3228	-0.0285	0.6845
Regina Qu'Appelle Health Region, SK	0.2164	0.0013	-0.1229	0.0803
Winnipeg Health Region, MB	0.2093	0.0018	0.1172	0.0947
N	1,855,636		374,051	

N reflects the removal of 147 discharged patients and 49 admitted patients from the analysis due to missing data. Model statistics are presented for the unconditional means model.
AIC = Akaike Information Criterion

The three-level model showed that once clustering at both the patient and hospital levels was accounted for, "region" was no longer a statistically significant predictor of performance on either metric. As a supplementary analysis, we explored how performance varied across hospitals. We calculated hospital-specific averages for (1) raw LOS and (2) LOS that was both log-transformed and adjusted for patient characteristics (using a score developed from a linear regression model to predict log-transformed LOS, with sex, age, arrival by ambulance and CTAS level as predictors [further details are available from the authors]). Even when adjusted scores were used, hospital-level performance varied considerably within regions (with the exception of the AHS South Zone, whose two hospitals were close neighbours on both metrics). We also explored whether hospital-level performance was sufficiently consistent across metrics and time to reveal high and low performers. A few hospitals did show strong performance on both admitted and discharged LOS. However, two of them served a special function in their respective regions by treating a lower acuity population and admitting less than 1% of patients; two more were the hospitals of the AHS South Zone; and the

FIGURE 1. Monthly average ED LOS (log) for discharged patients, by region

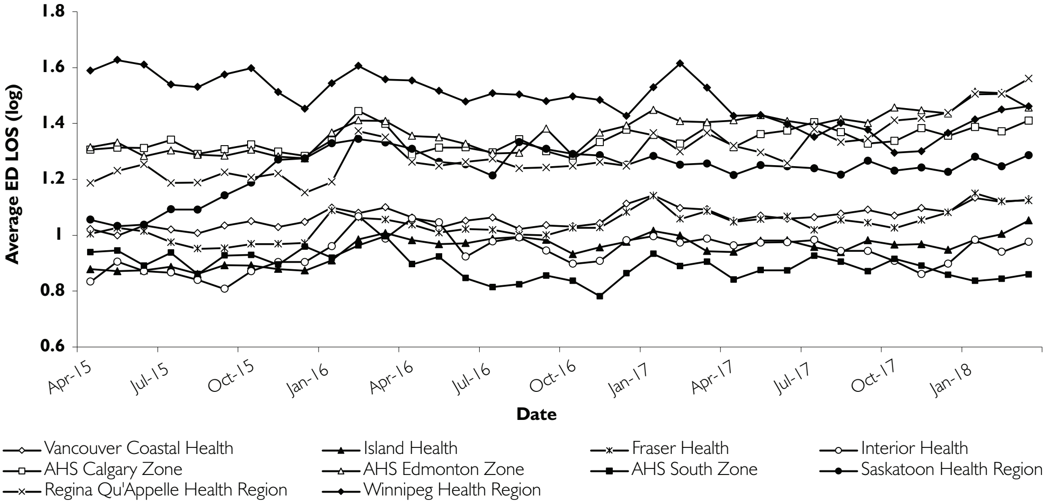
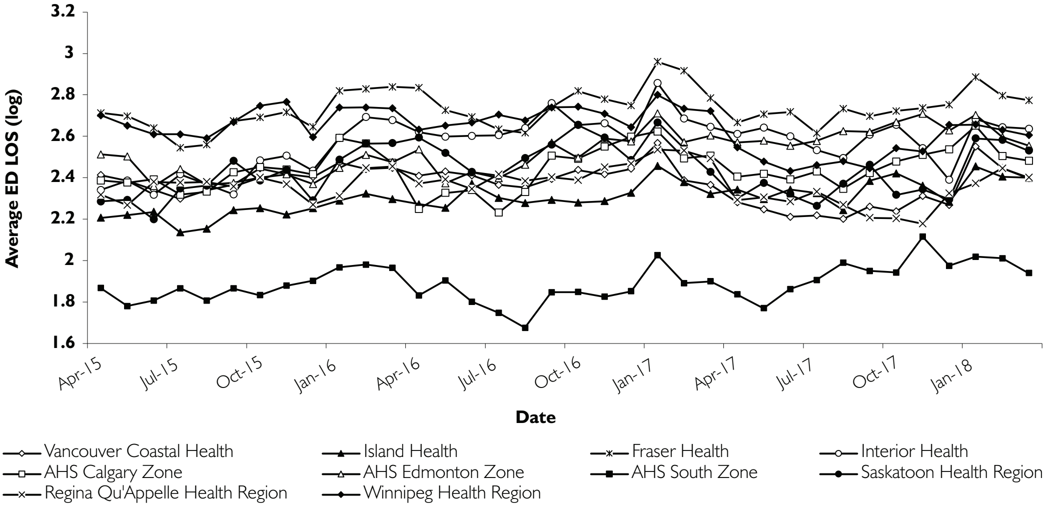


FIGURE 2. Monthly average ED LOS (log) for admitted patients, by region



remainder did not show exceptional performance in both years. In 2017–18, no hospitals performed markedly worse than average on both metrics; one hospital did so in 2016–17, but by 2017–18, it had regressed to the mean. Thus, there was little basis for selecting high- and low-performing hospitals.

Figures 1 and 2 track the regions' monthly performance over the three-year period. During the third year, the Winnipeg Health Region appeared to improve on both discharged and admitted LOS, approaching average performance. The AHS South Zone was consistently the strongest performer on discharged and (especially) admitted LOS, but showed little indication of improvement during the study period, nor did any other region.

Discussion

Findings indicated that the Western urban regions could not be divided into high- and low-performing subgroups. All but one region showed essentially average performance (which, in the Canadian context, means poor performance; CIHI 2017), nor did any region rise above the others during the study period.

These results made it impossible for us to complete a mixed-methods comparison as planned. However, qualitative data corroborated the quantitative findings of inter-regional similarity (Kreindler et al. 2020, 2021a, 2021b). Across the sample, participants reported that service offerings remained badly misaligned with population needs, resulting in pervasive inefficiency, inappropriateness and, in many acute facilities, a perpetual state of overcapacity. Similarity was also observed in the regions' flow strategies (Table 4). All regions relied heavily on intense day-to-day efforts to hasten discharge and manage overcapacity; these appeared to be used not as an adjunct to but as a substitute for rational system design. Some initiatives did redesign parts of the system; common examples included ED streaming, transition units, augmented home care for early discharge and streamlining of access to long-term care. According to participants, some initiatives had failed, fallen prey to cutbacks or been unable to sustain early positive outcomes, but many continued to be helpful. Nonetheless, system-level improvement remained elusive. Indeed, some participants argued that flatline performance should – in the face of escalating patient volume and complexity – be considered a success.

Each of the two regions that separated themselves from the pack has already been the subject of a case study (MacIntosh-Murray et al. 2010; Kreindler 2017). The AHS South Zone comprises two former regions: one undertook a major flow strategy in 2007–2010, including an addition of continuing-care capacity and an extensive, participative process of developing and implementing flow initiatives throughout the system (MacIntosh-Murray et al. 2010); the other subsequently undertook its own system-wide initiative. The AHS South Zone comprises two large hospitals separated by a great distance, allowing each locality to pursue improvement efforts on a manageable scale without adversely affecting the other. In contrast, the Winnipeg region featured six large hospitals in one city as well as a site/program matrix structure. With accountability distributed across groups that defined their patients in potentially incompatible ways, local initiatives not only failed to produce system-level improvement but often clashed with each other (Kreindler 2017). In early 2018, some interviewees attributed the region's recent improvement to an increase in transitional-care capacity or more aggressive implementation of flow initiatives; others suspected a Hawthorne effect, noting that the LOS dropped immediately after the announcement of a planned consolidation of acute care services.

We also found that regional performance was driven to a great extent by hospital-level performance, which varied widely within most regions. Although many of the flow strategies we heard about were regional, they often consisted of a scale-up of interventions that had to be executed at the hospital (or otherwise sub-regional) level. Local tailoring and implementation of such interventions seems entirely appropriate and naturally depends on local

TABLE 4. Most-discussed patient flow strategies

Strategy	Details
Processes to facilitate discharge	Heavily emphasized, with multiple activities (e.g., brief daily interdisciplinary rounds; in-reach by non-acute providers), roles (e.g., discharge navigators) and tools (e.g., whiteboards) in each region. Much effort was devoted to the ongoing active management of discharge practices.
Overcapacity management	Heavily emphasized. All hospitals used bed meetings to redistribute patients among departments, and overcapacity protocols were nearly universal. However, it was reportedly difficult to sustain overcapacity practices, especially under (common) conditions of persistently high in-patient occupancy.
Lean	All regions were using Lean at least on a small scale. Recent large-scale use was reported in Saskatchewan, especially in Saskatoon, and at one Interior Health hospital in BC. Lean was also a major element of the standard improvement methodology promoted by AHS, AB.
Transition units	All regions had unit(s) (in hospitals or other facilities) offering transitional and/or low-acuity care; a major expansion and consolidation of such care was under way in Winnipeg, MB. Several regions also noted transitional housing for persons with addiction/mental health issues.
Streaming of ED patients	Across regions, many EDs had minor treatment areas and (to an increasing extent) rapid assessment zones. All regions had at least one short-stay unit, but some units had been discontinued.
Locally highlighted initiatives	Regions in BC had installed a team in the ED to avert hospital admissions, specifically of older adults; this was first implemented and had recently been scaled up in Vancouver Coastal Health, BC. An accountable care unit (protected in-patient unit offering team-based care) was piloted in Regina, SK. Implementers hoped to scale up; this has not (yet) occurred, but the initiative was spread to Saskatoon.
Interventions to reduce ED input	All regions reported some strategies to reduce ED visits (e.g., community paramedics, community intravenous therapy, initiatives targeting frequent visitors, telephone advice lines). Participants in several regions also described how general primary-care renewal efforts contributed to flow.
Augmented home care/"home first"	Most regions offered a short-term enhancement of home care to facilitate early discharge from hospital; this was discussed the most in Winnipeg, where implementation occurred during the study period.
Capacity increases	Participants in most regions described increases in community and/or long-term care capacity, although recent investments were typically modest (large past expansions of continuing care were reported in AHS South Zone and Island Health, BC). Several regions were working on, or had already addressed (Regina), the supply of specialized long-term care beds. No region reported substantial recent changes in acute care capacity (other than the closure of a sizeable contingent of unfunded beds in Fraser Health, BC).
Process improvements (other)	Process improvements within EDs, hospitals, and community programs were diverse and too numerous to catalogue. Most regions had also introduced process improvements and policies to streamline access to long-term care and were engaged in efforts to improve repatriation of out-of-region patients.

leadership. Nonetheless, the observed variability in hospital performance raises questions about whether there are missed opportunities for regional or provincial strategy.

Indeed, much of the (limited) policy that has been directed toward flow, even if characterized by strong central direction, actually focuses on the promotion of local action.

One prominent example occurred when British Columbia offered financial incentives for ED flow performance at the regional level (2007–2014). This scheme was associated with improved performance in BC's Vancouver Coastal Health but not Fraser Health (Cheng and Sutherland 2013). Our informants noted that the former, but not the latter, used its pay-for-performance funds to support individual hospitals' improvement initiatives and reward their gains (i.e., to promote local action). In another example, overcapacity protocols introduced by AHS in 2010 were implemented to varying degrees in different zones, which relied on individual hospitals for implementation and enforcement; hospitals, in turn, put pressure on in-patient units to accommodate patients in non-traditional spaces. Calgary Zone participants reported that this approach initially yielded significant improvements in ED flow, but effects deteriorated after two to three years because such pressure could not be maintained indefinitely (Kreindler et al. 2020). The most common regional strategy has centred on encouraging local players to develop their own initiatives, whether through Lean or ad hoc methods (Kinsman et al. 2014; Kreindler 2018). As noted, such an approach succeeded in the two geographies of AHS South Zone, but other regions' attempts (which have, of course, varied widely in content and context) have not shown similar results. While many localized initiatives may have value, there seems to be a limit to what they can achieve, particularly in complex multi-hospital systems. The missing piece may be the establishment of alignment, at the system level, between population needs and service capacity. Notwithstanding much rhetoric about moving care into the community, activities suggested a greater focus on improving ED and hospital throughput than on ensuring that capacity, across the continuum of care, was adequate and well matched to patient needs. Population–capacity misalignment remained rife in the provinces we studied.

Unfortunately, the achievement of population–capacity alignment is not a simple proposition. As elucidated in a companion article based on our qualitative findings (Kreindler et al. 2021a), it would require a deeper understanding of patterns of population need, potentially substantial investments in community and/or institutional capacity and rethinking of models for accessing services (tackling the thorny issue of eligibility criteria). Such changes would need to be designed through careful analysis and the full engagement of providers, patients and informal caregivers lest the reforms create new bottlenecks and absurdities. Even so, they would likely be difficult, disruptive and, at least initially, expensive, demanding a degree of political will that has not been observed to date.

Limitations

This study has several limitations. First, our sample of regions was limited to 10. Making hospitals the unit of analysis would have afforded a larger sample, but at the cost of ignoring the regionalized administration of participating jurisdictions; furthermore, supplementary analyses showed that hospitals did not divide themselves into high- and low-performing subgroups either. Second, the study covered only part (albeit a sizeable part) of Canada and excluded rural regions and small facilities, whose flow-related issues are known to be different. The results are likely generalizable to other urban Canadian areas but cannot be generalized to rural and small facilities. Third, data extend only to early 2018 and do not take into account subsequent developments such as de-regionalization in Saskatchewan or the effects of the COVID-19 pandemic on emergency demand. Fourth, we used only one measure of ED flow; however, brief inspection of regional differences on other indicators confirmed that, whatever the indicator, regions did not split neatly into subgroups of high and low performers. We note also that we attempted multi-level models for other metrics (notably hierarchical logistic regression for LOS benchmarks) as supplementary analyses, but these models failed to converge in SAS 9.4. Fifth, in stratifying patients by admission status only, we may have missed inter-regional differences or temporal changes in LOS for certain subgroups of admitted or discharged patients. Further stratification was unsuited to our purpose of assessing overall regional performance and would have complicated the interpretation of results while inflating the likelihood of Type I error by increasing the number of comparisons. However, further research could examine flow patterns at a more granular level.

Another question that arises concerns the relative strength of patient characteristics, practice patterns, hospital features and environmental factors in predicting LOS. This question has been addressed to some extent by single-region and non-Canadian studies (Capuano et al. 2015; Doupe et al. 2017; Karaca et al. 2012); multi-regional Canadian research would be limited by the lack of universally reported data on several important variables. Our data set was particularly limited, in that we did not collect in-patient data, which precluded the analysis of in-patient metrics (notably bed occupancy) as predictors of ED flow.

Finally, this exploratory cross-sectional study could not test hypotheses about the effectiveness of specific strategies. It was seldom possible to isolate the timing of interventions, as all regions reported numerous initiatives with overlapping dates of implementation, scale-up and sometimes relaunch or revamping; moreover, the qualitative component was not designed to produce an exhaustive inventory. However, because what was observed was stagnation, the study provides at least suggestive evidence that the attempted strategies had limited impact.

Conclusion

Although participating regions were deeply engaged in diverse flow-improvement initiatives, nearly all exhibited a similar, low level of performance. These findings, especially in conjunction with the study's qualitative component, cast doubt on the effectiveness of prevailing approaches to flow. It may be time to look beyond specific initiatives and day-to-day practices to ask what deeper changes may be required to rectify long-term misalignment between capacity and demand.

Acknowledgements

As the discussion section draws on information gathered from the study's qualitative component, we wish to thank Stephanie Hastings, Sara Mallinson, Meaghan Brierley, Noah Star, Shannon

Winters, Keir Johnson, Mohammed Rashidul Anwar, Zaid Aboud, Arden Birney, Rima Tarraf and Ashley Struthers for their contributions to qualitative data collection and analysis.

Funding

The study was funded by a Partnerships for Health System Improvement grant from the Canadian Institutes of Health Research (PHE-141802).

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RESEARCH PAPER

Non-Official Language Concordance in Urban Canadian Medical Practice: Implications for Care during the COVID-19 Pandemic

Concordance des langues non officielles dans la pratique médicale en milieu urbain au Canada : implications pour les soins pendant la pandémie de COVID-19

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Abstract

Language barriers can reduce access to medical and virtual care. Although the topic of healthcare professionals and linguistic minorities has been studied in Canada, it has mainly been done for official languages (i.e., English and French). Non-official languages (NOLs) have not been explored previously in the healthcare system at the pan-Canadian level. The objective of this study is to determine to what extent NOLs spoken by physicians relate to those of Canadian ethnic groups and are an enabler of access to care. Using data from the Canadian Institute for Health Information (CIHI) and Statistics Canada, we found an imbalance in the physician-to-population NOL ratios in Montreal and, to a lesser extent, Vancouver.

Résumé

Les barrières linguistiques peuvent réduire l'accès aux soins médicaux en personne ou virtuels.

Bien que la question des professionnels de la santé et des minorités linguistiques ait été étudiée au Canada, cela concernaient principalement les langues officielles (anglais et français). La question des langues non officielles (LNO) n'a pas été explorée dans le système de santé au niveau pancanadien. L'objectif de cette étude est de déterminer dans quelle mesure les LNO parlées par les médecins concordent avec celles des groupes ethniques au Canada et permettent de faciliter l'accès aux soins. À l'aide des données de l'Institut canadien d'information sur la santé et de Statistique Canada, nous observons un déséquilibre dans le rapport des LNO entre les médecins et la population à Montréal et, dans une moindre mesure, à Vancouver.

Introduction and Background

Poor language proficiency and inadequate communication are potential barriers to access to medical care. International studies note that miscommunications in the healthcare sector can sometimes lead to life-threatening results (Meuter et al. 2015). The COVID-19 pandemic has made access to medical care more problematic and may compound the existing language and communication issues, given the disproportionate toll of COVID-19 on immigrant populations. Although immigrants, refugees and other newcomers make up just over 25% of the Ontario population, they accounted for 43.5% of all COVID-19 cases (Guttmann et al. 2020).

Physician service imbalances based on language ability have long been considered in the context of official language minorities, mostly francophones, in Canada (Bowen 2000; Federal, Provincial and Territorial ACPH 1999; Lepage and Lavoie 2017; Ngwakongnwi et al. 2012; Timony et al. 2016). Research on language barriers and Indigenous access to healthcare is also growing (Office of the Languages Commissioner of Nunavut 2015; Webster 2018).

Poor language facility and thus poor physician–patient communication can represent a non-trivial barrier to access to high-quality care (Bowen 2001). Recent immigrants lack information about health systems, have different cultural expectations or experience discrimination as visible minorities. This analysis focuses on proficiency in either official language for doctors and patients, particularly the one dominant provincially. According to the 2016 census, about 23% of the population has a mother tongue that is a non-official language (NOL), slightly higher than the 21.4% of the population with French as their official mother tongue.

Preliminary data from Santé Montreal (2020) and Toronto's (DeClerq 2020) public health offices, among others, have shown COVID-19 incidence and mortality rates to be higher in ethnic communities where a large number of residents speak an NOL. Guttmann et al. (2020) noted lower rates of COVID-19 testing for recent immigrants and refugees in Ontario, with a lack of English or French language ability associated with lower testing. Moreover, those who ended up being tested had higher positivity rates. Data from 10 US cities show that the impact of COVID-19 is about three to nine times higher in poor and non-White counties (Adhikari et al. 2020). Assuming that being non-White is a proxy for NOL proficiency, the impact of COVID-19 is therefore associated with poverty and poor official language ability.

As a result of the COVID-19 pandemic, all jurisdictions have promoted and expanded virtual care (VC) measures to enhance the safety and efficacy of the medical workforce. They have created new/temporary fee codes and/or repurposed existing fee codes for telephone or video consultation services. Details are provided by CIHI (2020a), which monitored and compiled the changes made to jurisdictional fee schedules and billing codes. While VC has many benefits, it can be challenging for ethnic minorities, who are more likely to be NOL speakers and might barely speak/understand English or French.

COVID-19 can compound the existing structural and societal inequalities in health status among immigrant or ethnic minority populations (van Dorn et al. 2020). With more VC, communication problems due to lack of language facility can be compounded by absence of body language (in the case of telephone consultation) or poorly interpreted facial signals and body language, as has been noted in the case of video conferencing (Jiang 2020).

Because VC can be delivered across a wide region, it can quantitatively increase access to care during a pandemic, but quality and equity aspects should also be considered. VC is less effective if the people most impacted by the pandemic have limited proficiency in English or French and lack access to physicians with NOL facility. A better understanding of the situation can inform whether additional measures are required to reduce health disparities due to linguistic/cultural barriers.

Objective, Research Question and Contribution to the Literature

This research can inform medical and health system management response, decision making and planning within and across Canadian jurisdictions. The question addressed is as follows: *To what extent do foreign languages spoken by physicians in Canadian urban areas relate to those of ethnic minorities?* Given the current Canadian physician distribution, we expect some NOL discordance across jurisdictions. If a mismatch is indeed found, this analysis could prompt decision makers to provide incentives for improving physician access via adjustments in language and communication services. This can improve the uptake and efficiency of virtual consultations, which is becoming more crucial for the Canadian healthcare system in the context of the pandemic.

Ethnicity and utilization of healthcare providers have been studied in the context of single and multiple ethnic groups. Wang et al. (2008) found preference among mainland Chinese survey respondents for Chinese-speaking family physicians in the Toronto Census Metropolitan Area (CMA). De Mossaic and Bowen (2019) explored the experience of minority francophones living in four Canadian provinces; they found that language barriers contribute to poorer patient assessment, misdiagnosis, delayed treatment and incomplete understanding of patient condition. McKeary and Newbold (2010) found that refugees or recent immigrants speaking neither English nor French faced problems accessing primary care and were more likely to report problems in accessing specialists. Waibel et al. (2018) studied multiple ethnic groups (adults who spoke English, French, Mandarin, Cantonese or Punjabi) and multiple geographic areas (British Columbia, Manitoba and Quebec), focusing on the impact of language barriers on healthcare experiences. While the research examining the effects of language on healthcare patterns and use is abundant (Lepage and Lavoie 2017; Ngwakongnwi et al. 2012; Rawal et al. 2019; Timony et al. 2016), only one study, to our knowledge, has examined the capacity of medical care providers to offer services in the most common NOLs in Canada. Sears et al. (2013) looked at patient–physician language discordance for the top five NOLs (Chinese, Italian, Punjabi, Portuguese and Spanish) in each census division (CD) of Ontario. They found that there were at least five CDs with a non-English/non-French population speaking a NOL without any primary care physician proficient in that NOL.

We pair self-reported physician proficiency in NOL with that of the population to illuminate physician supply and demand matches for most Canadian provinces. We contribute by examining the indicators of both the capacity of medical staff to provide services in a foreign language and the demand of the population for these services in the major CMAs, using more NOLs and updated data.

Method

Scott's Medical Database (SMDB) 2018 data from CIHI (2020b) are used to track the top 10 NOLs spoken by family and specialist physicians in the seven largest CMAs. Physicians are defined as anyone with an MD degree and a valid postal code, which includes family physicians as well as specialists. Self-reported professional proficiency in other languages (other than the one used for correspondence) is one of the variables collected, and these data are publicly accessible by making a custom data request to CIHI. Each physician with proficiency in one or more NOLs is assigned to a CMA (with a population of 100,000 inhabitants or more) based on their mailing address in SMDB. The mailing address typically reflects the geographic region where physicians practise, providing a reasonable indication of the access to medical care available to the region's population. Data for any given region with a count of less than five physicians are suppressed. Each physician with NOL proficiency was also assigned to an urban non-metropolitan area (with a minimum of 10,000 inhabitants) and a rural/remote area (with less than 10,000 inhabitants). However, the issue of low occurrence in these areas prevented doing the analysis at these levels.

Data from the 2016 Census of Statistics Canada (2017) were used to track the number of persons reporting various NOLs (persons with a NOL as mother tongue, which might also be the language spoken most often at home) by CMA.[1] The top 10 NOLs spoken in the population and reported by Statistics Canada are as follows: Chinese (including Mandarin and Cantonese), Punjabi, Tagalog (Filipino), Spanish, Arabic, Italian, German, Urdu, Portuguese and Persian (Farsi). These represent 62% of the NOLs spoken in Canada, and 14% of the total population of Canada speaks one or more of these NOLs. About 67 Aboriginal languages were reported in the 2016 census, but people reporting an Aboriginal language as their mother tongue represent 0.6% of the Canadian population. Even the most common ones in this category – Cree, Inuktitut and Ojibway – suffer from the low occurrence issue for physicians with NOL proficiency. Only four physicians reported speaking one of the three most common Aboriginal languages at the national level. Therefore, physicians with Aboriginal language proficiency could not be included in this analysis.

We assume that patients wishing to receive medical services in their mother tongue are willing to travel or receive VC within their CMA – known as a "container-based" approach (Langford et al. 2016). This approach computes a supply-to-demand ratio within the boundaries of a fixed geographic space with no interaction across boundaries. Other approaches to understanding primary care utilization patterns include the "distance-based" or "floating catchment area" (FCA) approach (Guterman et al. 2011; Langford et al. 2016; Luo and Wang 2003; Stukel et al. 2013). For other patient attribution methods, see the studies by McCoy et al. (2018) and Peckham et al. (2018). The nature of the studied characteristic (accessibility based on NOL) does not lend itself to the FCA method in all the CMAs because low occurrence hampers the analysis in many cases. Hence, we use the "container-based" method, as the boundaries coincide with the CMA and are large and geographically inclusive enough that cross-CMA interaction is unlikely to happen, thus supporting the choice of this method. It is commonly believed that virtual or distance care could potentially expand access to services because patients are not limited to the physicians in their immediate vicinity. However, adults seeking routine care have a preference for services within a 30-minute drive, making the CMA a good geographic study choice (Yen 2013).

These CMAs must have a critical mass of physicians speaking one of the top 10 NOLs. Critical mass was defined as more than 200 physicians for each CMA to ensure adequate sample size. Seven CMAs fit this criterion: Montreal, Ottawa, Toronto, Winnipeg, Calgary, Edmonton and Vancouver. The percentage of physicians speaking a NOL are compared to the percentage of the population speaking that language. Physician–population ratios by NOL and CMA are also provided, with imbalances based on the observed gaps.

The physician-to-population NOL ratio is an important indicator and can be defined as the number of physicians who speak a NOL in a given area divided by the number of people who speak the same NOL in that area and multiplied by 1,000. A very large gap (defined as ±50% of the total physician–population ratio) can indicate a perceived surplus or deficit.

Results

Counts of NOL speakers among physicians

The top 10 NOLs reported by physicians in SMDB are Chinese, Arabic, Spanish, Punjabi, Urdu, Afrikaans, German, Hindi, Italian and Farsi/Persian. They also correspond to the top 10 NOLs spoken by the population, except for Afrikaans and Farsi/Persian, which are replaced by Tagalog (Filipino) and Portuguese. Table 1 provides the number of physicians speaking one of these languages in the seven largest CMAs in Canada. Percentages are reported in brackets.

The top 10 NOLs spoken by physicians largely vary among CMAs. For example, Spanish was the most common NOL spoken by physicians in Montreal and Ottawa (at about 2.3%), while it was Chinese in Toronto and Vancouver (at about 5.0%), Arabic in Edmonton (4.0%) and Urdu in Calgary (3.3%).

Counts of NOL speakers among the general population and concordance with physicians

In the general population, the variation in NOL speakers among the CMAs is low. Chinese is the most common NOL spoken in all the seven largest CMAs (5.4%), except in Montreal and Winnipeg, where the most common are Spanish and Punjabi, respectively. They were spoken by 2% of the population in these CMAs (Table 2).

Comparing the percentages in Tables 1 and 2 can inform us on the level of concordance of NOL speakers among physicians and the general population. It varies with the CMAs. The proportion of NOL-speaking physicians outweighed that of the NOL-speaking population for most CMAs, which means the NOL capacity is generally adequate. However, Montreal had the lowest proportion of Arabic-speaking physicians (0.2%), but it ranks the second-highest in the proportion of its Arabic-speaking population (1.9%). Similarly, the proportion of Chinese- and Punjabi-speaking physicians in Vancouver is much lower than that of the population itself.

TABLE 1. Number and percentage (in brackets) of physicians speaking one of the top 10 NOLs in the seven largest Canadian CMAs (both sexes) in 2018

Top 10 NOLs	Montreal	Ottawa	Toronto	Winnipeg	Calgary	Edmonton	Vancouver	Total seven CMAs[2]
N (%)	11,032 (12.3)	4,336 (4.8)	15,596 (17.4)	2,335 (2.6)	4,539 (5.0)	4,116 (4.6)	6,920 (7.7)	48,874 (54.4)
Afrikaans	0 (0.0)	8 (0.2)	35 (0.2)	12 (0.5)	92 (2.0)	60 (1.5)	65 (0.9)	272 (0.6)
Arabic	26 (0.2)	57 (1.3)	393 (2.5)	42 (1.8)	80 (1.8)	166 (4.0)	36 (0.5)	800 (1.6)
Chinese[1]	13 (0.1)	46 (1.1)	730 (4.7)	25 (1.1)	126 (2.8)	141 (3.4)	349 (5.0)	1,430 (2.9)
German	48 (0.4)	44 (1.0)	118 (0.8)	29 (1.2)	53 (1.2)	55 (1.3)	74 (1.1)	421 (0.9)
Hindi	9 (0.1)	27 (0.6)	301 (1.9)	22 (0.9)	100 (2.2)	76 (1.8)	68 (1.0)	603 (1.2)
Italian	103 (0.9)	36 (0.8)	222 (1.4)	5 (0.2)	19 (0.4)	23 (0.6)	22 (0.3)	430 (0.9)
Persian/Farsi	7 (0.1)	15 (0.3)	213 (1.4)	13 (0.6)	40 (0.9)	27 (0.7)	69 (1.0)	384 (0.8)
Punjabi	4 (0.0)	26 (0.6)	315 (2.0)	29 (1.2)	116 (2.6)	86 (2.1)	142 (2.1)	718 (1.5)
Spanish	259 (2.3)	105 (2.4)	330 (2.1)	40 (1.7)	87 (1.9)	64 (1.6)	88 (1.3)	973 (2.0)
Urdu	7 (0.1)	31 (0.7)	453 (2.9)	30 (1.3)	149 (3.3)	117 (2.8)	74 (1.1)	861 (1.8)
Total 10 NOLs[2]	476 (4.3)	395 (9.1)	3,110 (19.9)	247 (10.5)	862 (19.0)	815 (19.8)	987 (14.3)	6,892 (14.1)

1. Chinese includes Mandarin and Cantonese.
2. Numbers or percentages may not exactly add up to total 10 NOLs and total seven CMAs due to rounding.
Source: CIHI 2020b

TABLE 2. Number (1,000) and percentage (in brackets) of people speaking one of the top 10 NOLs in the seven largest Canadian CMAs (both sexes) in 2016

Top 10 NOLs	Montreal	Ottawa	Toronto	Winnipeg	Calgary	Edmonton	Vancouver	Total seven CMAs[2]
N (%)	3,784.2 (10.8)	921.6 (2.6)	5,321.9 (15.1)	647.1 (1.8)	1,294.3 (3.7)	1,235.3 (3.5)	2,252.5 (6.4)	15,456.9 (44.0)
Afrikaans	0.0 (0.0)	0.0 (0.0)	0.3 (0.0)	0.0 (0.0)	0.5 (0.0)	0.3 (0.0)	0.5 (0.0)	1.6 (0.0)
Arabic	73.0 (1.9)	19.1 (2.1)	45.0 (0.8)	2.8 (0.4)	11.0 (0.9)	10.6 (0.9)	8.7 (0.4)	170.2 (1.1)
Chinese[1]	56.5 (1.5)	20.5 (2.2)	380.6 (7.2)	11.7 (1.8)	46.0 (3.6)	31.8 (2.6)	283.9 (12.6)	830.9 (5.4)
German	1.6 (0.0)	0.6 (0.1)	3.6 (0.1)	1.5 (0.2)	1.5 (0.1)	2.3 (0.2)	2.9 (0.1)	14.0 (0.1)
Hindi	1.5 (0.0)	1.3 (0.1)	24.0 (0.5)	1.2 (0.2)	4.1 (0.3)	5.1 (0.4)	11.2 (0.5)	48.4 (0.3)
Italian	32.4 (0.9)	2.5 (0.3)	51.9 (1.0)	1.0 (0.1)	1.3 (0.1)	1.4 (0.1)	4.0 (0.2)	94.3 (0.6)
Persian/Farsi	18.3 (0.5)	4.1 (0.4)	67.3 (1.3)	1.3 (0.2)	6.5 (0.5)	3.2 (0.3)	27.4 (1.2)	128.0 (0.8)
Punjabi	8.8 (0.2)	2.2 (0.2)	116.0 (2.2)	13.2 (2.0)	29.1 (2.2)	20.7 (1.7)	104.9 (4.7)	294.9 (1.9)
Spanish	76.7 (2.0)	6.1 (0.7)	70.4 (1.3)	3.3 (0.5)	17.5 (1.4)	10.9 (0.9)	18.3 (0.8)	203.2 (1.3)
Urdu	7.1 (0.2)	2.2 (0.2)	78.1 (1.5)	1.7 (0.3)	11.1 (0.9)	5.1 (0.4)	5.2 (0.2)	110.4 (0.7)
Total 10 NOLs[2]	275.8 (7.3)	58.7 (6.4)	837.1 (15.7)	37.7 (5.8)	128.6 (9.9)	91.3 (5.4)	466.9 (20.7)	1,896.0 (12.3)

1. Chinese includes Mandarin and Cantonese.
2. Numbers or percentages may not exactly add up to total 10 NOLs and total seven CMAs due to rounding.
Source: Statistics Canada 2017

Physician-to-population NOL ratio

The more concise indicator *physician-to-population NOL ratio* is presented in Table 3. Note that Afrikaans is omitted from now on due to the virtually insignificant number of people speaking this NOL in the population.

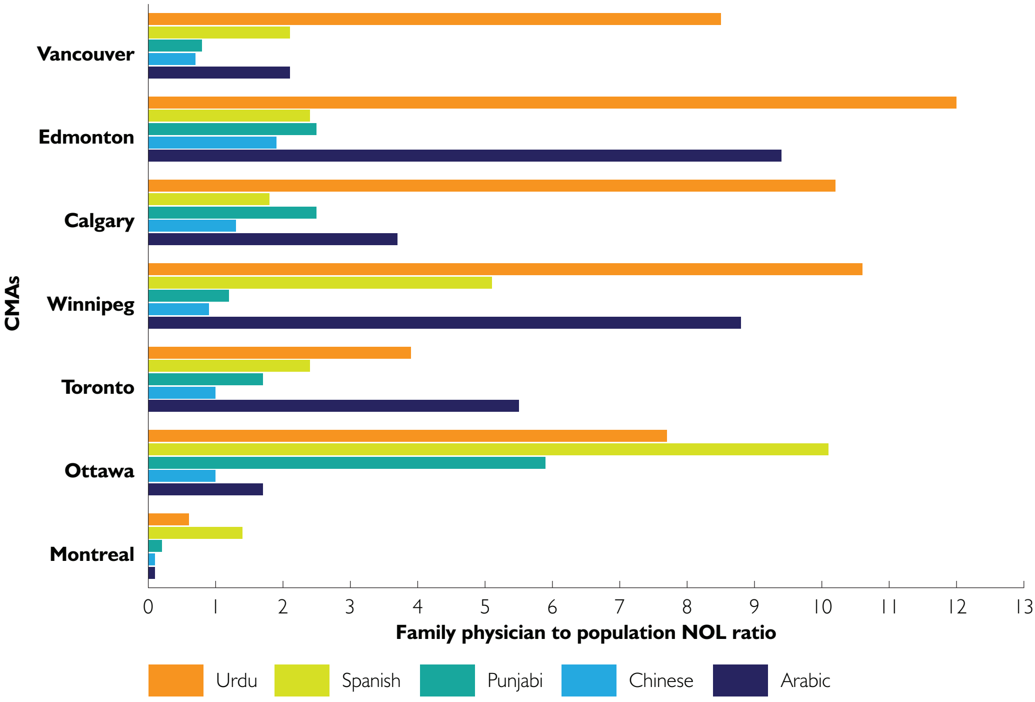
TABLE 3. Physician-to-population NOL ratio (per 1,000) for the top nine NOLs in the seven largest CMAs

Top nine NOLs	Montreal	Ottawa	Toronto	Winnipeg	Calgary	Edmonton	Vancouver	Total seven CMAs
Arabic	0.4	3.0	8.7	14.8	7.3	15.7	4.1	4.7
Chinese[1]	0.2	2.2	1.9	2.1	2.7	4.4	1.2	1.7
German	30.3	70.4	32.9	19.7	34.4	23.8	25.6	30.0
Hindi	6.1	20.9	12.5	18.3	24.2	14.9	6.1	12.5
Italian	3.2	14.3	4.3	5.2	15.0	16.4	5.6	4.6
Persian/Farsi	0.4	3.7	3.2	10.4	6.2	8.4	2.5	3.0
Punjabi	0.5	11.8	2.7	2.2	4.0	4.2	1.4	2.4
Spanish	3.4	17.2	4.7	12.1	5.0	5.9	4.8	4.8
Urdu	1.0	14.0	5.8	17.7	13.5	22.9	14.3	7.8
Total (Top NOL)	1.7	6.7	3.7	6.6	6.7	8.9	2.1	3.6
Total (Population)	2.7	3.8	2.6	3.0	3.3	3.1	2.8	2.8

1. Chinese includes Mandarin and Cantonese.
Source: Authors' calculations using data from CIHI (2020b) and Statistics Canada (2017).

The general physician-to-population ratio varies between 2.6 and 3.8 among the seven CMAs (last row), suggesting that for most languages and CMAs, the physician-to-population NOL ratio compares favourably to that of the general population. However, this has not been the case for Montreal and Vancouver. In Montreal, the physician-to-population NOL ratio is much lower than that of the general population for Arabic, Chinese, Persian, Punjabi and Urdu. In the case of Vancouver, this indicator is lower only for Chinese and Punjabi. Otherwise, these ratios are not perceived as a constraint or are even generally higher than that of the population. Because primary care is a critical and voluminous component of the medical services provided by family physicians, the case for this specialty should be considered specifically. We have chosen to do so in Figure 1 for the top five physician NOLs.

FIGURE 1. Family physician-to-population NOL ratio for the top five physician NOLs in the seven largest CMAs



Chinese includes Mandarin and Cantonese.
Source: Authors' calculations using data from CIHI (2020b) and Statistics Canada (2017).

Based on the general family physician-to-population ratio among the seven CMAs, which ranges from 1.2 to 2.1, we can also imply that for most languages and CMAs, the family physician-to-population NOL ratio compares favourably to that of the general population. For specific languages and CMAs, the pattern is about the same as that for physicians in general.

General Discussion, Policy Implications and Limitations

General discussion

For CMAs such as Montreal and Vancouver, the physician-to-population NOL ratio is lower than that of the general population for Chinese and Punjabi. On the other hand, this indicator is higher for Edmonton. Where the physician-to-population NOL ratio is much lower than that of the general population, there may be a larger impact on access to health services and health status, with a greater reliance on VC in the wake of COVID-19. While access concerns could be mitigated with increased physician workloads in affected areas, such an approach can come with lifestyle and equity issues with respect to workload.

The impact of this imbalance could be all the more important, given that among these communities, some people speak neither English nor French (the two official languages in Canada), which is more likely so for women. The percentage of people not speaking either Canadian official language is higher in Vancouver and Toronto (5.6% and 4.4%, respectively) and lower in Montreal, Ottawa, Winnipeg and Edmonton (Statistics Canada 2017). This makes the need to address the issue somewhat less critical in the latter cities. Also, there is a consistently higher proportion of women than men who do not speak any of the two official languages (for example, 6.4% vs 4.7% in Vancouver). Based on the principles of equity, diversity and inclusion, addressing this issue specifically in the case of Vancouver and Toronto would also reduce gender and ethnic imbalance.[2]

Policy implications

Traditionally, physicians are self-regulated, with a high level of professional autonomy. Solutions for access issues due to poor language proficiency and poor communication need to reflect this reality. In addition, ascertaining an ideal physician-to-population NOL ratio and using it as a policy target is a challenging exercise for improving access for NOL populations. For example, in Canada, the urban and rural physician-to-population ratios were 2.6 and 1.1, respectively (Ariste 2018), which means the rural ratio represents about 40% of the urban.[3] A physician-to-population NOL ratio that represents the same as that of the rural population seems "reasonable" as an initial measurement benchmark. This target could be used to provide incentives to attract physicians in CMAs or regions with a deficiency. While rural areas are generally recognized as underserviced, we want to be conservative in the case of NOL and still choose them as a policy benchmark target for accessible services. Approaches used to remedy rural and remote service deficiencies may apply here.

Having provincial health ministries establish a special incentive payment to physicians agreeing to provide services in a certain NOL via VC might be helpful, especially when it comes to specialists. It might take the form of additional fee codes to be used when seeing NOL patients within a given census division. The exact form would of course need to be developed in consultation with the physician community. Provincial health ministries may wish to work with the federal government to secure additional funding for such an initiative. Furthermore, another way of adding to the stock of physicians with NOL proficiency is encouraging NOL-speaking international medical graduates (IMGs) who independently desire to immigrate to Canada to settle in areas where NOL services are needed. However, there is no need to set a NOL module as part of the medical school training as it is not realistic to expect medical students to acquire enough proficiency in a new language to be comfortable enough to deliver services in that language. Moreover, the current diversity of available physicians already provides a suitable stock of NOL capacity. The issue is the distribution and availability of that capacity to specific populations and that can be addressed with the aforementioned incentive payments. It might also be possible to recruit medical students with NOL proficiency in placement drives and assign them in regions where there is a need. Evidence suggests that rural exposure during medical training can improve the recruitment and retention of physician services in underserviced areas, such as remote rural areas, though challenges remain (Bosco and Onandson 2016; Holst 2020).

Another option might be to extend and improve interpreter services for NOL populations. For example, the Winnipeg Regional Health Authority employs trained health interpreters, who provide face-to-face and telephone interpreter services in 32 and 200 languages, respectively (WRHA n.d.). Additionally, there are commercial services that provide telephone translation in multiple languages (https://www.alllanguages.com/; Provincial Health Services Authority 2021).

Limitations

Our inability to report on other communities is a limitation. Still, it is not a major one because CMAs are the home for more than 90% of newcomers in Canada since the early 1990s (Statistics Canada 2015), and some of these newcomers are likely to be NOL speakers. The variable on professional proficiency in NOLs is self-reported by physicians. Yet, substantial data quality checks have been implemented, and the data for the past few years have been deemed fit for use. While the proportion of IMGs in Canada in 2018 was 26.4%, the percent of physicians who reported having proficiency in one or more NOL was 17%, which is a majority (about two thirds), as one would expect. Also, the number of physicians who reported having proficiency in a NOL in SMDB is at least on par with that for provinces with administrative data on publicly available NOL as reported by College of Physicians and Surgeons of Ontario (CPSO 2019) and the College of Physicians and Surgeons of British Columbia (CPSBC 2021).

Besides, SMDB groups physicians neither by their place of residence nor location of practice but based on the place they receive their mail (a valid mailing address). This does not represent a serious limitation for physicians practising in urban areas, as they typically have a mailing address that is close (or corresponds) to their workplace. Finally, data on languages spoken at the population level cannot account for people who are multilingual or for the level of proficiency in the official language spoken. That is beyond this study's scope.

Conclusion

The data suggest higher diversity and frequency of NOLs spoken among physicians than the general population, especially for European languages such as Spanish, German and Italian. NOL discrepancy is most relevant when the percentage of NOL-speaking physicians is much lower than that of the general population, as is the case in Vancouver and Montreal for languages such as Chinese (Mandarin and Cantonese), Punjabi and Arabic. Addressing these discrepancies and their potential impact on access to healthcare and services is an important issue. Potential solutions include targeted incentives to physicians and recent medical graduates as well as improvement in interpreter services.

Acknowledgement

The authors would like to thank Deborah McCartney, Hetal Dave and Chardé Morgan for their work during the data processing and request that supported the development of this analysis. However, the views expressed in this document are those of the authors and do not represent those of any institution or other individual.

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Notes

1. Statistics Canada intercensal estimate of the population does not report counts by ethnic characteristics or NOLs spoken. Therefore, it was not possible to use 2018 population data.
2. It is likely that there is also a generational imbalance because seniors in ethnic minorities tend to be overrepresented among those not speaking any of the official languages, and they could be more at risk during a pandemic. However, that would be a topic for a separate study.
3. This percentage varies considerably among jurisdictions. For example, it is only 17% in Ontario but 44% in Quebec, suggesting that rural/remote areas in some jurisdictions are more underserved than others.

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RESEARCH PAPER

Time-Driven Activity-Based Costing for Cataract Surgery in Canada: The Case of the Kensington Eye Institute

Méthode des coûts par activités en fonction du temps pour la chirurgie de la cataracte au Canada : le cas du Kensington Eye Institute

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Abstract

Time-driven activity-based costing (TDABC) has received considerable attention globally as a way to measure value in healthcare systems. This study aimed to apply TDABC for cataract surgery at the Kensington Eye Institute (KEI). During a field evaluation, a detailed process map was created for cataract surgery at KEI. The amount of resource use in terms of providers, equipment, space and consumables was calculated to determine the total costs of care. The average patient journey lasted 76 minutes, with 13 minutes of the surgical procedure occurring in the operating room (OR). The average procedure's cost per case was $545.28, which included consumables (34.40%), space and equipment (23.702%), personnel

(11.69%), overhead (30.27%) and OR (57%). KEI cataract operation was at approximately 50% capacity due to funding limits. The TDABC process map and costing allow centres to have data-driven support tools for care redesign and optimization.

Résumé

La méthode des coûts par activités en fonction du temps reçoit beaucoup d'attention à l'échelle mondiale comme moyen de mesurer la valeur dans les systèmes de santé. L'étude visait à appliquer cette méthode à la chirurgie de la cataracte au Kensington Eye Institute. Lors d'une évaluation sur le terrain, une carte détaillée du processus a été créée pour la chirurgie de la cataracte à l'Institut. La quantité de ressources utilisées en matière de fournisseurs, d'équipement, d'espace et de matériel a été calculée afin de déterminer le coût total des soins. Le trajet moyen du patient a duré 76 minutes, dont 13 minutes pour la procédure chirurgicale en salle d'opération. Le coût moyen de la procédure par cas était de 545,28 $, dont 34,40 % pour le matériel, 23,702 % pour l'espace et l'équipement, 11,69 % pour le personnel, 30,27 % pour les frais généraux et 57 % pour la salle d'opération. Les activités d'opération de la cataracte à l'Institut représentaient environ 50 % de la capacité totale, et ce, en raison des limites de financement. La cartographie des processus et la méthode d'établissement des coûts permettent aux centres de disposer d'outils de soutien fondés sur les données, afin de concevoir la refonte et l'optimisation des soins.

Background

Kaplan and Anderson (2004) introduced the time-driven activity-based costing (TDABC) approach as an alternative to the complicated and burdensome activity-based costing (ABC) approach (Cooper 1989). Unlike ABC, which requires subjective interviews, validation and continuous updates, TDABC measures two variables: (1) the unit cost of supplying capacity and (2) the time needed to perform an activity (Kaplan and Anderson 2004). TDABC is a bottom-up approach to costing that estimates costs based on the time for which the particular service has been used. TDABC has been used extensively in manufacturing and service industries, but healthcare organizations have not widely adopted it. In recent years, within the context of value-based healthcare (VBHC) described by Porter and Teisberg (2006), a few healthcare provider organizations used TDABC to define the cost of their services, including computed tomography scan, anticoagulation clinics and emergency departments (Berthelot et al. 2017; Martin et al. 2018; Ying et al. 2016; Yun et al. 2016).

VBHC links dollars spent to health outcomes that matter to patients, rather than to volumes of services or to specific processes that may or may not achieve those outcomes (Zelmer 2018). However, to date, there is limited experience with TDABC in the Canadian healthcare system. Nevertheless, with the new interest in VBHC, researchers have applied the TDABC process to the clinical procedures in pediatric ophthalmology, sinus surgery and breast cancer screening (Au and Rudmik 2013; Gulati et al. 2018; Nabelsi and Plouffe 2019). In order to further explore the applicability of TDABC in a Canadian setting, this study evaluated cataract surgery – a well-defined procedure – in an ophthalmology integrated practice unit (IPU). The Kensington Eye Institute (KEI) is a not-for-profit specialized healthcare facility affiliated with the Department of Ophthalmology and Vision Sciences, University of Toronto. KEI is licenced under the *Independent Health Facilities Act* (Government of Ontario 1990) and offers cataract, glaucoma and retina surgery as well as corneal transplants (North Toronto Eye Care n.d.). The goal of this study was to implement TDABC for cataract surgery at KEI.

This study will be of interest primarily to healthcare administrators. TDABC provides a less complicated alternative to ABC by allowing centres to directly estimate each procedure's resource demands, even for complex and specialized procedures.

Method

KEI surgeons performed 9,881 cataract procedures in 2019 that constitute 81% of the surgical procedures at KEI (Ontario Ministry of Health and Long-Term Care 2019). The scope of this study was to focus on the surgical procedure for cataract treatment. Accordingly, only activities that were relevant to cataract surgery at KEI were considered. Pre- and post-procedural activities (e.g., outpatient ophthalmology assessment) and possible procedural complications were excluded. The authors conducted an observational field evaluation and several interviews with the KEI clinical team and management. During the field evaluation study, the authors shadowed the KEI staff on a day dedicated to cataract surgery. To develop a detailed process map, authors followed 15 patients, one at a time – from intake to discharge – recording the procedural steps taken by the KEI administrative staff, clinical staff and surgical teams. The time spent at each of the following stages was recorded, starting from the registration/administrative area and activities in the care area – including preoperative (pre-op), transition to the operating room (OR), OR time and post-operative care unit (PACU) – to discharge. The staff activities relevant to the care process and their role in each functional area were identified and listed. KEI has four ORs and one separate laser room. The surgical department and the KEI senior management provided a list and annual cots of the equipment/services and clinical staff including their accreditation and remuneration. This study was approved by the KEI management and was conducted from the KEI perspective; therefore, the physician fees were excluded from the calculations. The study is an observational process evaluation and cost analysis. There was no intervention or interaction with patients, and no patient data were collected or accessed. As such, there was no need for the ethics review board approval.

Calculations and statistical analysis

This study used KEI data to calculate the capacity cost rate (CCR) for resources documented in the process map. CCR is defined as the cost of capacity-supplying resources divided by those resources' actual capacity (Keel et al. 2017). The variables for the CCR were personnel, space and time. To calculate each activity's cost, the CCR was multiplied by the probability-weighted time and probability of space use (e.g., the laser room was used only in 20% of the cases). As mentioned earlier, cataract surgery makes up 81% of the total surgical procedures performed at KEI, which is reflected in the calculations. The only exception was surgical equipment, 100% of which was allocated to the cataract procedure. To calculate space cost, the total annual rent was divided by the total square footage and reallocated to each area used in the care cycle based on the square footage. Capital equipment allocation was based on the location of use, with a five-year amortization rate added to the annual maintenance cost.

The CCR for the care team personnel was calculated by multiplying the annual clinic working days (240 days excluding weekends, holidays, and vacations) by the number of available activity minutes per day (excluding breaks) multiplied by the number of full-time equivalent employees to define the total personnel capacity. For activities that involved multiple care team members, each care team member's role, time spent on a task and the activity's location were used to determine the relevant costs. For activities that did not have personnel involvement (e.g., a patient waiting in the pre-op area), only space and equipment allocation was considered in the calculations. During the time out, several care team members carried out several activities simultaneously, including preparation for the next surgery, scrubbing and cleaning the OR. Hence, time was allocated as total value. Two resources were used throughout the care cycle in all the activities: the surgical chair and the OR manager. The surgical chair cost was calculated by dividing the total annual maintenance and capital cost for in-use chairs divided by the yearly case volume and overall care cycle time and was allocated to each activity on a weighted processing time basis. The OR manager was not directly involved in procedures. However, as an essential care team member, this role's cost was allocated across all activities. The capacity utilization rate was calculated by dividing the time (minutes) demand per year to perform cataract procedures by the total available time.

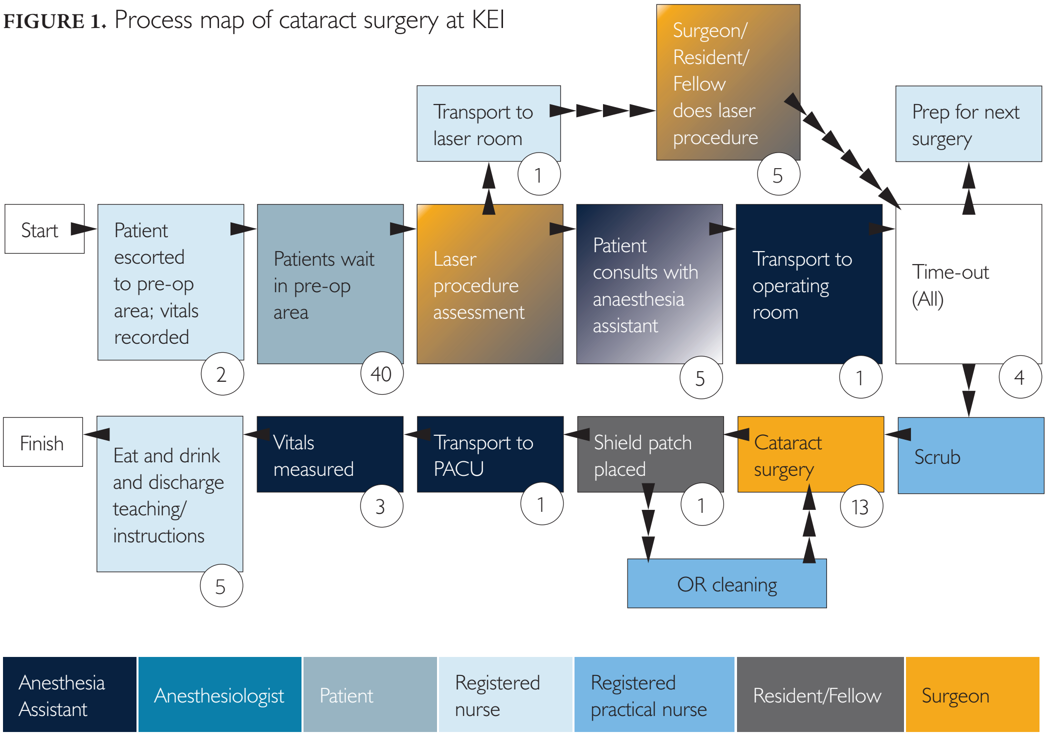
Human, space and capital and consumables resources

The activity cost included three types of salaried personnel: registered nurse (RN), anesthesia assistant (AA) and registered practical nurse (RPN). There were nine full-time RNs, six AAs and nine full-time RPNs active on each operating day. However, the AAs' total personnel cost has been divided by six, as KEI employs only one of the six AAs needed on a regular working day. The care delivery occurred in four main areas that are shown in the process map: pre-op, laser room, OR and PACU. Two additional areas (administration and sterilization process departments) were considered in the overhead expenses. Descriptive statistics were used to define the resource use during the procedure (see Appendix Table A1, available online at longwoods.com/content/26496). All costs are in 2019 Canadian dollars.

Results

Figure 1 illustrates the process map of the cataract surgery procedure at KEI. The process map depicts decision points, location of care, activities and the care team members involved at each step during the care delivery process. Each activity is colour coded, identifying the most responsible individual for each activity. The number in the circles specifies the time (minutes) needed to perform each activity. The laser procedure assessment is the only decision making that occurs during the process, which takes place in the pre-op area. Only 20% of patients undergo a laser procedure. The remaining 80% proceed to consult with the AA. All proper personnel conduct the time out activity, including preparation for the next surgery, scrubbing and OR cleaning, which happens simultaneously between operations. The time for the overall care cycle for cataract surgery lasted 76 minutes. The average wait time in the pre-op area was 40 minutes. However, this step did not use any resources. The procedure time for the cataract surgery was 13 minutes, with the highest number of active personnel.

FIGURE 1. Process map of cataract surgery at KEI



Circles define the duration of the steps in minutes.

Table 1 identifies the direct costs and CCR for the cataract procedure. The available time per year for each care team member was 93,600 minutes. The RN's total time capacity was 682,344 minutes per year and the cost for RN services was $760,973, resulting in a CCR of $1.12. The total annual space cost for the laser room was $9,064, with a total of 81.551 minutes per year, resulting in a CCR of $1.04 including the equipment. The CCR for OR space and equipment was $4.63. The RN bears the highest cost per case at $33.68.

The AA cost is considerably lower, given that the KEI covers the cost of one of the six

TABLE 1. CCR for cataract procedure

	Capacity cost rate	Time (minutes)	Cost per case
Personnel			
Registered nurse	$1.12	30	$33.68
Anesthesia assistant	$1.32	27	$5.89
Registered practical nurse	$0.71	17	$12.15
Operating room manager	$0.15	76	$11.72
Space and equipment			
Pre-operative room	$0.46	47	$21.51
Laser room	$1.04	1	$1.04
Operating room	$4.63	18	$83.43
Post-anesthesia care unit	$1.43	9	$12.87
Chair	$0.14	76	$10.39
Not allocated			
Consumables	NA	NA	$187.55

AAs on a regular surgical day. The CCR for the OR manager was $11.72 per case. The OR space and equipment rate was the highest at $83.43, followed by the pre-op and PACU rates. Table 2 demonstrates the space capacity use for patient care areas. The OR and laser room capacity utilization were 55% and 12%, respectively. In comparison, the pre-op area capacity utilization was 498%, mainly due to the 40 minutes waiting time for patients with no additional value-added activities. Similarly, the personnel's capacity utilization (e.g., RN, AA and RPN) was 43%. The total cost of the care cycle per case was $545.28 (Table 3). The cost driver for the cataract surgery procedure was consumables, responsible for 34.4% of the total cost per procedure, followed by space and equipment (23.7%), overhead (18.6%), corporate overhead (11.7%) and personnel (11.6%; $63.44). The rate-limiting area for a potential expansion was the PACU, at 95% capacity use.

TABLE 2. Resource capacity utilization rate and cost

Patient care areas and personnel	Time per care cycle (minute)	Annual case volume	Time per year (minutes)	Capacity utilization rate	Cost of unused capacity
Operating room	18	2,470	44,465	55%	$171,892
Laser room	1	9,881	9,881	12%	$74,621
Pre-operative room	47	9,881	464,407	498%	-$169,899
Post-anesthesia care unit	9	9,881	88,929	95%	$6,110
Registered nurse	30	NA	296,430	43%	$430,385
Registered practical nurse	17	NA	167,977	25%	$367,493
Anesthesia assistant	27	NA	266,787	59%	$248,199

TABLE 3. Total cost per case for cataract surgery

Consumable	Space and equipment	Personnel	KEI overhead	KHC overhead to KEI	Total overhead*	Total cost per case
$187.55	$129.24	$63.44	$101.31	$63.74	$171.54	$545.28
Percentage of total costs						
34.40	23.70	11.63	18.58	11.69	30.27	NA

*Total overhead is the sum of KEI overhead and Kensington Health Centre (KHC) overhead allocated to KEI for cataract procedures.

Secondary Analyses

For benchmarking KEI with other centres, a secondary analysis was conducted to include the cost of the personnel supporting cataract procedures who did not have a KEI contract (e.g., an anesthesiologist and five AAs). In this scenario, the total case cost increased by 9.9% to $599.34. A sensitivity analysis with a 20% and a 30% increase in annual cataract cases demonstrates that the baseline case cost could be reduced by 5.72% ($514.09) and 6.99% ($507.19), respectively, as the overhead cost was diluted. At a 30% increase in annual cases, the OR and personnel capacity utilization was estimated at 76%. The PACU capacity utilization at 95% is a rate-limiting area. However, by increasing the number of PACU operating hours by two, KEI can increase the cataract surgery volumes by 30% with no other incremental investment.

Discussion

There are numerous ways in which hospitals can perform service line costing. The cost-to-charge ratio, relative value unit and return on investment are conventional cost-accounting approaches (Phillips and Phillips 2007; Shwartz et al. 1995). While these costing methodologies are essential and useful, they do not always provide the granularity required to correctly attribute a cost to a particular service or activity at the patient level (Gapenski 2016). However, TDABC can provide detailed costing at the patient level for a given service or therapy. There have been limited examples of the application of TDABC in the Canadian healthcare system (Au and Rudmik 2013; Gulati et al. 2018; Nabelsi and Plouffe 2019). Accurate, patient-level costing can enable providers, administrators and policy makers to make informed investment decisions.

In Canada, costing based on the case mix grouping (CMG) model was the first attempt to better understand the costs of hospital procedures (Pink and Bolley 1994). However, as a medical model, CMG does not consider critical resources such as nursing intensity; instead, it uses a per diem approach to nursing (Cockerill et al. 1993). In order to overcome the deficiencies in the CMG approach, the case-cost approach has been used in Ontario, mainly built on the Canadian Institute for Health Information Management Information Systems (MIS) (CIHI 2019; Ministry of Health and Long-Term Care 2010).

However, case costing requires additional data collection that can be linked to an individual case (CIHI 2019). The additional data include workload statistics, supply/service and intermediate products (e.g., specific tests or procedures). Each activity under the MIS is measured through the national workload measurement systems that quantify activities in a standardized unit of time, including the nursing workload measurement (e.g., time spent for patient assessment). This addresses the shortcomings in the CMG approach (Ministry of Health and Long-Term Care 2010).

While case costing as a refined ABC for healthcare systems can provide a relatively accurate cost estimate for a condition, it is often onerous, complicated and dependent on multiple variables, which can distort the data (HMF 2016). Advantages of TDABC over the traditional costing methodologies include the prevention of cost distortions, and simplicity – the unit cost of supplying capacity and the time needed to perform an activity are the only two factors considered by the system (Öker and Özyapici 2013). Furthermore, this system determines unused capacity by considering practical capacity. TDABC is less sensitive to the overhead cost, and in organizations with substantial overhead (e.g., hospitals), TDABC will provide more accurate costing compared to ABC (Tarzibashi and Ozyapici 2019).

This study examined the TDABC methodology's viability in a Canadian independent health facility (IHF) with an integrated practice unit model predominantly in ophthalmology. The study showed that the average cost of a cataract procedure, excluding physician payment, was between $545.28 and $599.34. In contrast, the average total cost of cataract surgery in Ontario across all providers was $720.00 (*SD* =± $399) (Ontario Ministry of Health and Long-Term Care 2019). The *Ontario Quality-Based Procedures Clinical Handbook for Cataract Day Surgery* used the CMG and resource weight factor to estimate the cost of cataract procedure. Interestingly, the average OR time reported in the handbook was 14 minutes for routine unilateral cataract surgery (Ontario Ministry of Health and Long-Term Care 2018). The authors excluded the physician fees to evaluate the procedure cost similar to the hospital system. When physicians' fees were added (Ontario Schedule of Benefits Codes E140 and E950 at $397.75 and $92.50, respectively), the final cost case increased further by 81.8% to $1,089.59 (Ontario Ministry of Health 2020).

KEI has created an optimized process for cataract surgery through an efficient workflow. This finding aligns with a recent US-based study that examined the process efficiency in high-volume cataract surgery (Van Vliet et al. 2011). From a broader viewpoint, this study reflects focused factory principles to address the productivity crisis due to conflicting goals (Skinner 1974). The same concept can be generalized to include large hospitals that deliver a broad range of services with contradictory goals at the operational level, often resulting in suboptimal health outcomes at a high cost. In large hospitals, virtually every department acts independently, without any consideration for other departments. The hospitals could potentially create "focused healthcare services" by carving out small units of hospital operations that can create independent, planned, repetitive and predictable activities with optimal results (Bredenhoff et al. 2010). IPU efficiency has been demonstrated in various cataract surgery and hernia repair studies (Davidow and Uttal 1989).

While this analysis looked only at an IHF and a single service line, there is an opportunity to bring TDABC at scale to the Canadian hospital sector. The balance between service demand and managing cost has been the focus of Canadian and global healthcare systems (Bohmer 2009; Christensen et al. 2017; Porter and Teisberg 2006). Consequently, hospital administrators are trying to make funding decisions to provide optimal service outcomes. TDABC can shed light on hospital operations in different ways:

Firstly, it can reveal which service lines are feasible and potentially cost-saving (Hennrikus et al. 2012). Hospitals may choose to invest further in these service lines and use those saved dollars to reinvest in other areas essential to their communities. Conversely, it can provide new insights into service lines that may be underperforming, and this can only be achieved appropriately through TDABC. In addition, the process maps developed for TDABC allow hospitals to understand their workflow, which would facilitate procedural improvements.

Secondly, adopting a standard and accurate costing methodology for hospitals can also help hospital administrators and clinicians better understand how they perform against their peers. Over time, this could help all hospitals improve healthcare delivery efficiency across several service lines. Generally, the data favour a focused approach versus general service hospitals in both cost and quality. However, public hospitals may have unintended consequences such as labour disruption or community backlash if multiple procedures are taken out of general hospitals (Kruse et al. 2019).

Implementing a standardized costing approach, which has been undertaken in some provinces in Canada (e.g., Ontario), is an excellent first step. However, to make informed policy and expenditure decisions, the costing methodology needs to be standardized and accurate. Applying TDABC across hospitals and service lines would lead to a greater understanding of the cost at the service or procedure level. It would also help administrators better understand health human resource utilization as every input in the process is tracked and converted into associated costs. Accurate costing can facilitate informed policy decisions, such as allocating procedural volumes to the most cost-effective settings, and lead to the creation of centres of excellence or focused factory models in which hospitals specialize in certain areas. While we recognize that cost is not the only factor in decision making, this approach could inform policy makers on which procedures may be better delivered in alternative (i.e., non-hospital based) care settings, which is challenging due to the inaccuracies with current costing methodologies. Given the limitations in the digital capabilities and available resources at many healthcare institutions in Canada, implementing TDABC can be challenging and require investment in technology and data collection capabilities. However, if health system administrators would like to better understand how funds are being utilized and inform better decision making, TDABC could be beneficial.

Limitations

This study examined the application of TDABC in the context of an IHF that is subject to certain policy exemptions. IHFs can be for profit or not-for-profit and can offer a variety of therapeutic and diagnostic services. Many hospitals and other providers around the world have used TDABC. One of the limitations of this study is the setting. KEI being a cataract surgery IPU, defining the procedure steps, resources used and costs for the procedure were practicable. To implement the same methodology in other settings, one must first map the processes and overcome the limitations associated with complex interconnected operations. As such, the feasibility of a similar analysis in the Canadian hospital sector is unclear due to interdepartmental dynamics, as care may be provided by separate departments. Another major hurdle would be disseminating a new cost-accounting methodology and the required change management. While TDABC does provide an accurate estimate of the actual costs associated with a service, it can be time-consuming and requires additional resources and training. This analysis was conducted on unilateral cataract surgery without major complications. Therefore, the cost estimates may not extrapolate to complex or bilateral cataract surgery or other sophisticated techniques such as laser surgery. Finally, this analysis took place in Canada, and therefore, the estimated cost excludes physician payment because the physician directly bills the provincial ministry of health.

Conclusion

TDABC can accurately calculate the cost of care in a Canadian setting, enabling informed decision making. Through workflow and resource use optimization and reducing the cost of care without impacting the clinical outcomes, TDABC can drive data-driven policy decisions resulting in an effective and efficient healthcare system.

Acknowledgement

The authors would like to acknowledge Bill Tottle (vice president and chief financial officer), Donna Punch (vice president, Ambulatory Services), Thuong Huynh (manager, KEI) and John Yip (president and chief executive officer) for sharing their expertise and the data that enabled this study.

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