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Comfortable Silence- ©2021

By Lynn Cameron

Acrylic on canvas. 20" X 50"

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I am a Calgary artist and stroke survivor. I paint with my non-dominant hand. I also live with aphasia.

Having lived on the West Coast and now residing in Calgary, my artwork is increasingly drawn to themes of nature and the wilderness, its constant evolution and the subtle changing of the seasons.

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A cold winter's night

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I do not remember all the deliveries I have attended, but some stick out; one in particular that was not especially difficult or triumphant. Of course, it was joyous, as to be expected, with a lovely baby girl to show for it. I remember it for other reasons. It was cold and over the hours I had been in the hospital attending my primip, freezing rain had fallen. Slippery in the parking lot but not atrocious or so I thought.

I chiselled my way into the car, scraped the windshield into at least some semblance of visibility and headed home. I was perhaps a bit distracted by the pleasant delivery. I was pretty much on autopilot when I went down the hill, so I really did not clue in. Well, I did not clue in until I was well past the point of no return. There was some momentary anxiety when I realized that my ability to control my car was compromised. I was not going fast at all (I was not entirely unaware) but gravity and a low coefficient of friction made me come to peace with physics quickly. Luck or my steering inputs had me slowly slide into the ditch rather than the lake, far off at the bottom of the hill.

Exiting the car I determined, with great insight, that it was difficult to actually walk anywhere. The ditch offered the best traction. By the bye, a patient of mine was able to pull me out (but only after the town's sander

had come by!). In the end, I was able to go back home to bed, and as it was over New Year's, I was able to sleep in (bonus).

In the years to follow, I saw both mom and the growing girl on many an occasion. Sometimes out in public. Sometimes, I saw them socially. Sometimes in the office for well-baby visits or the inevitable respiratory tract infection. Over time the little girl grew up and left town to seek ambition elsewhere (as many bright young children from these parts do).

I ask, and am kept periodically up to date, about her progress from Mom. Mom's retired now and apart from boredom in the depths of the pandemic, she is enjoying every minute. She is healthy, on no medications and I do not see her that often. In truth, there is no need. However, when I do see her, I am reminded of a wonderful delivery that occurred 30 years ago and, more importantly, all the details of life that happened subsequently.

It may not be a particularly extraordinary story, but my practice is full of them. It is the richness of these types of stories, these types of memories and these types of relationships that I find so fulfilling. It's this connection that gives meaning to the work of a rural generalist physician. I am truly thankful for having the opportunity to be one. We have a wonderful profession.

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Une froide nuit d'hiver

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Je ne me souviens pas de tous les accouchements auxquels j'ai assisté, mais certains m'ont marqué plus que d'autres; un en particulier qui n'a été ni trop facile ni trop difficile. Bien sûr, comme s'est souvent le cas, c'était un moment joyeux avec l'arrivée d'une adorable petite fille. Cependant, je m'en souviens pour d'autres raisons. Il faisait froid et pendant les heures que j'avais passées à l'hôpital à m'occuper de ma primipare, une pluie glaciale était tombée; glissante dans le stationnement, mais pas exécrable, du moins c'est ce que je pensais.

Je me suis rapidement frayé un chemin pour accéder à ma voiture. J'ai gratté le pare-brise pour obtenir au moins un semblant de visibilité et je me suis mise à conduire en route vers mon domicile. J'étais peut-être un peu distraite par l'accouchement agréable qui venait de SE produire. J'étais plus ou moins un mode pilote automatique lorsque j'ai descendu la colline, sans trop savoir ce qui allait SE produire. Malheureusement, je m'en suis rendu compte seulement bien après le point de non-retour. J'ai ressenti un moment d'anxiété lorsque j'ai remarqué que je n'étais plus en contrôle de mon véhicule. Je n'allais pas vite du tout, mais la gravité et un faible coefficient de friction m'ont soudainement rappelé les lois de la physique. Je ne sais pas si c'était juste la chance ou la manière dont j'ai manœuvré mon volant, mais j'ai réussi à glisser lentement dans le fossé, au lieu de me retrouver dans le lac tout en bas de la colline.

En sortant de la voiture, j'ai constaté, avec une grande perspicacité, que le terrain rendait toute marche difficile.

Le fossé offrait la meilleure traction. Par chance, un de mes patients a réussi à me dégager, mais seulement après le passage de la sableuse de la ville! Après tout cela, j'ai finalement réussi à rentrer chez moi et, comme c'était le jour du Nouvel An, j'ai pu faire la grasse matinée (un repos bien mérité).

Dans les années qui ont suivi, j'ai revu à plusieurs reprises la maman et sa petite fille; parfois en public, parfois socialement et parfois au bureau pour des visites de bien-être du bébé ou l'inévitable infection des voies respiratoires. Avec le temps, la petite fille a grandi et a quitté la ville avec des objectifs plein la tête; comme le font beaucoup de jeunes enfants brillants de ces régions.

Je demande à la maman de me tenir au courant de ses progrès, ce qu'elle fait périodiquement. Elle est maintenant à la retraite et, à part l'ennui qu'elle a ressenti aux pires moments de la pandémie, elle profite de chaque minute. Elle est en bonne santé, ne prend aucun médicament et je ne la vois pas si souvent. En vérité, ce n'est pas nécessaire. Cependant, lorsque je la vois, je me souviens d'un accouchement merveilleux qui a eu lieu il y a trente ans et, surtout, de tous les détails de la vie qui SE sont déroulés par la suite.

Ce n'est peut-être pas une histoire particulièrement extraordinaire, mais mon cabinet en est rempli. C'est la richesse de ces types d'histoires, des souvenirs et de ces liens que je trouve si épanouissants. C'est ce lien qui donne un sens au travail d'un médecin généraliste rural. Je suis vraiment reconnaissant d'avoir la chance d'en être un. Nous avons une merveilleuse profession.

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President's Message – Rural emergency room closures

A system in crisis. We are all feeling the heavy burden of increased workloads, lack of nursing and physician staff to provide clinical care, and higher volumes of patients seeking care in emergency departments. The relief we all hoped to feel, as case numbers, hospitalisations and deaths from COVID-19 decreased, has eluded us. We feel the moral injury of the late presentations and preventable illnesses, knowing that, despite our best efforts to provide care in this crumbling system, we have not been able to live up to the standards of our training.

It is an incredibly challenging time to work in healthcare, and the pressures felt in urban areas are only amplified for those of us working in the rural communities. In many regions, rural teams have had to face the difficult decision to close or limit services. While we all understand the importance of setting boundaries and a need to have some time off to be able to sustain work long term, it is harder to put into action. There is always a sense of guilt in seeing your patients at the grocery store, your

child's sports practice, while spending time exercising or out to dinner with friends, knowing the emergency room is closed for the night. However, we are not the ones to blame for this.

All too often physician wellness initiatives have focused on having physicians come to terms with setting boundaries and augmenting their self-care or mindfulness strategies. However, these actions are far from sufficient to sustain our rural healthcare systems. We must demand more from our mayors, MPPs/MLAs and Federal government; rural Canada deserves better. We must also engage our patients in conversations around appropriate use of system resources, preventative care, injury prevention and ongoing strategies to reduce the transmission of illness. As part of our efforts to engage patients and governments in these critical conversations, the SRPC has launched an initiative regarding Emergency Department closures: https://srpc.ca/HHR_resource.

We know there is a crisis, but does everyone else? It's time we ensure they do, as this is not our burden to carry alone.

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Message de la présidente. Fermeture des salles d'urgence en milieu rural

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Un système en crise. Nous ressentons tous le lourd fardeau de l'augmentation de la charge de travail, du manque de personnel infirmier et de médecins pour fournir des soins cliniques, ainsi qu'un volume plus élevé de patients cherchant à se faire soigner dans les services d'urgence. Le soulagement que nous espérions tous ressentir, face à la diminution du nombre de cas, d'hospitalisations et de décès dus à la COVID-19, ne s'est pas produit. Nous ressentons cette blessure morale générée par des arrivées tardives de maladies et des maladies évitables, sachant que malgré tous nos efforts pour fournir des soins dans un système qui s'effrite, nous n'avons pas été en mesure d'être à la hauteur des normes de notre formation.

C'est une période incroyablement difficile de travailler dans le domaine des soins de santé, et les pressions ressenties dans les zones urbaines ne sont qu'amplifiées pour ceux d'entre nous qui travaillent dans des collectivités rurales. Dans de nombreuses régions, les équipes rurales ont dû faire face à la décision difficile de fermer ou de limiter des services. Bien que nous comprenions tous l'importance de fixer des limites et la nécessité de prendre des moments de repos pour être en mesure de soutenir le travail à long terme, la mise en pratique de cette possibilité n'en reste pas moins difficile. Il n'est pas facile de s'échapper du sentiment

de culpabilité si nous croisons nos patients à l'épicerie, aux activités sportives de nos enfants, en allant au gym ou en sortant souper avec des amis, en sachant que le service d'urgence est fermé pour la nuit. Pourtant, il ne faut pas oublier que nous ne sommes pas les seuls responsables de cette situation.

Trop souvent, les initiatives de bien-être des médecins visent une stratégie de de fixer des limites et d'augmenter leurs stratégies de soins de soi et de pleine conscience. Cependant, ces actions sont loin d'être suffisantes pour soutenir nos systèmes de santé ruraux. Nous devons exiger davantage de nos maires, de nos députés provinciaux et du gouvernement fédéral. Le Canada rural mérite mieux. Nous devons également engager nos patients dans des conversations sur l'utilisation appropriée des ressources du système, notamment les soins préventifs, la prévention des blessures et les stratégies continues visant à réduire la transmission des maladies. Dans le cadre de nos efforts pour engager les patients et les gouvernements dans ces conversations critiques, la SMRC a lancé une initiative portant sur la fermeture des services d'urgence: https://srpc.ca/HHR_resource (en anglais uniquement).

Nous savons qu'il y a une crise, mais les autres sont-ils conscients ? Il est temps que la population soit mis au courant, et que nous ne soyons pas les seuls à porter ce fardeau.



ORIGINAL ARTICLE

Building More Bridges: Indigenous leadership in a study assessing the impact of distance to care on markers of quality HIV care in Saskatchewan

Abstract

Introduction: Individuals in rural and remote areas face barriers to chronic disease care, including HIV. Saskatchewan has the highest HIV incidence among Canadian provinces and 35.6% of the population lives outside of an urban centre. In this study, we explored the relationship between distance to HIV care and markers of quality HIV care in Saskatchewan as part of the Canadian Observational HIV Cohort (CANOC).

Methods: We used a Two-Eyed Seeing approach and honoured the experience of Indigenous team members living with HIV. The Positive Partnership Score (PPS) was the primary outcome (including frequency of viral load and CD4 measurements, baseline CD4 count, antiretroviral medication regimen and virologic suppression). Multivariable linear regression analysis was performed with distance to care defined in two ways: (1) categorical based on distance from home to HIV specialist care and (2) road distance from CANOC enrolment site.

Results: Two hundred and seventy-six individuals were included in the analyses. Living ≤ 25 km from a visiting HIV specialist (where no HIV specialist lives in the community permanently) and living > 100 km from the closest HIV specialist (either visiting or permanent) were both associated with lower PPS compared to living ≤ 25 km from where an HIV specialist practises permanently. Each 10 km further from the CANOC enrolment site was associated with a 0.01-point reduction (95% CI-0.02, 0, $P = 0.024$) in PPS.

Conclusion: Through a strength-based approach that was grounded in culture, connection, land and Ceremony, we demonstrated how Indigenous people with HIV can play a key role in research. Distance from care was associated with a poorer quality of HIV care in Saskatchewan highlighting the need for better rural HIV care.

Keywords: Distance to care, HIV, Indigenous leadership, Saskatchewan

Résumé

Introduction: Les personnes vivant dans les régions rurales et éloignées sont confrontées à des obstacles aux soins des maladies chroniques, y compris le VIH. La

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Saskatchewan a l'incidence du VIH la plus élevée parmi les provinces canadiennes et 35,6% de la population vit en dehors d'un centre urbain. Dans cette étude, nous avons exploré le lien entre la distance aux soins du VIH et les marqueurs de la qualité des soins du VIH en Saskatchewan dans le cadre de la Canadian Observational HIV Cohort (CANOC).

Méthodes: Nous avons utilisé l'approche de « regard des deux yeux » et honoré l'expérience des membres autochtones de l'équipe vivant avec le VIH. Le score de partenariat positif (SPP/PPS) était le résultat primaire (incluant la fréquence des mesures de la charge virale et des CD4, le nombre de CD4 de base, le régime de médicaments antirétroviraux et la suppression virologique). Une analyse de régression linéaire multivariable a été effectuée avec la distance aux soins définie de deux manières: 1) catégorique, basée sur la distance entre le domicile et les soins d'un spécialiste du VIH, et 2) distance routière du site d'inscription au CANOC.

Résultats: 276 individus ont été inclus dans les analyses. Le fait de vivre à ≤ 25 km d'un spécialiste du VIH en visite (lorsqu'aucun spécialiste du VIH ne vit en permanence dans la collectivité) et le fait de vivre à > 100 km du spécialiste du VIH le plus proche (en visite ou en permanence) étaient tous deux associés à un SPP plus faible par rapport au fait de vivre à ≤ 25 km du lieu où un spécialiste du VIH exerce en permanence. Chaque tranche de 10 km plus éloignée du site d'inscription de CANOC était associée à une réduction de 0,01 point (IC 95%: -0,02, 0, $P = 0,024$) du PPS.

Conclusion: Grâce à une approche fondée sur les forces et ancrée dans la culture, les liens, la terre et les cérémonies, nous avons démontré comment les autochtones atteints du VIH peuvent jouer un rôle clé dans la recherche. La distance par rapport aux soins était associée à une moins bonne qualité des soins du VIH en Saskatchewan, ce qui souligne la nécessité d'améliorer les soins du VIH en milieu rural.

Mots-clés: VIH, Saskatchewan, leadership autochtone, distance par rapport aux soins

INTRODUCTION

In Canada, individuals living in rural and remote regions have higher all-cause mortality, incidence of injury and prevalence of many chronic conditions.¹⁻⁵ Difficulty in accessing health-care services, which is reported by over 50% of people in rural Canada, may contribute to these discrepancies.¹⁻⁵ Rural communities are frequently impacted by significant physician and nurse shortages, limited access to screening and diagnostic programmes and higher emergency department and hospitalisation rates compared to urban areas.^{1,6,7} A significant barrier to care is having to travel long distances to access services, which is exacerbated by limited transportation options, associated costs and inflexible hours of operation.^{1,6-11}

Associations between access in rural settings and HIV-specific outcomes have also been noted, such as lower testing rates, later diagnosis, delayed linkage to care, lower treatment uptake and poorer clinical markers of HIV care.¹² Additional barriers to rural HIV care include HIV-related stigma and confidentiality concerns, limited community and provider HIV education and a lack of HIV services such as specialists, peer programmes and other social support services.^{10,12-14}

In 2018, there were roughly 62,050 people living with HIV in Canada, and rates of new diagnosis increased by 8.2% compared to 2017.¹⁵ Of these individuals, 85% were receiving antiretroviral therapy (ART), which is essential to reduce disease progression, including death and prevent HIV transmission.¹⁶⁻¹⁸

Saskatchewan has the highest HIV incidence amongst Canadian provinces with HIV transmission rates nearly double the Canadian average.^{15,19} However, only two major cities have multidisciplinary HIV clinics which may not be accessible to the 35.6% of the Saskatchewan population living outside of an urban centre.²⁰ Although a few visiting HIV specialists provide care in smaller/remote communities, there is a lack of HIV-specific care, peer support and HIV educational resources available – particularly in rural/remote Indigenous communities where HIV transmission is high.²¹ HIV-related stigma, discrimination and racism are rampant. These barriers, coupled with long travel distances to services, are significant barriers to HIV care in rural Saskatchewan.^{21,22}

In response to these barriers, our team sought to take a strength-based approach to support Indigenous people living with HIV in Saskatchewan. Grounded by a deep connection

with the land, this study aimed to nurture relationships among our team of researchers, most of whom are Indigenous people living with HIV. We aimed to bring light to the difficulties of those who are furthest away from HIV care in Saskatchewan. In doing so, we sought to better understand the impact of distance to HIV care on HIV outcomes in Saskatchewan.

METHODS – GUIDING PRINCIPLES TO INDIGENISE OUR WORK

Building connections

The foundations of this project were the relationships that we developed and the value placed on living experience. Indigenous people living with HIV, all of whom brought diverse living experiences to this project, passed on their knowledge and collectively held up each other's knowledge. With humility and respect, a group of Indigenous and non-Indigenous researchers who had previously collaborated on HIV research projects in Ontario and British Columbia invited colleagues in Saskatchewan to join our research journey with a focus on HIV in Saskatchewan [Figure 1].²³

Key principles included: creating a safer space for the work, reciprocal learnings and teachings, connecting with Indigenous ways of healing, valuing the input of all team members equally, using strength-based and accessible language and making significant decisions collaboratively. We welcomed family members into our activities as we honoured the importance of family and sharing knowledge across generations. Team members participated based on their availability (body, heart, mind and spirit), and frequent communication and updates allowed for ongoing participation of team members. We used a co-writing approach where we collaboratively structured and wrote this paper and applied principles of capacity bridging, which 'recognises that everyone around the table has something to share and contribute to the project'.²⁴

Culture and Ceremony

Our team came together in Saskatoon on Treaty 6 territory (Treaty 6 encompasses the traditional territories of numerous Indigenous Nations,



Figure 1: Authorship Circle. In keeping with Indigenous ways of knowing, we present authorship as a circle rather than a hierarchical list. The circle represents our connection with each other through the project and acknowledges each person contributed in a meaningful, unique way. Names are arranged based on the land where they live. The names are arranged around a photograph of the rattles that we made during our gathering.

including Cree, Dene, Nakota, Saulteaux, Ojibwe and homeland of the Métis Nation and Settlers) for a 3-day gathering where Ceremony guided and protected us.²⁵ Each day started with Ceremony to ground us and start the day in a good way and closed with Ceremony so that our team and our ancestors could rest. Ceremony was how we honoured the first caretakers and walkers of the land we were on. We spent our first day together building connections with the land, eating food and drinking tea from the land, and were gifted knowledge and energy from the land. This knowledge guided us as we discussed HIV care in Saskatchewan and collectively identified our research question. On subsequent days, we continued to connect as we received teachings and made sacred items including medicine pouches and rattles. These teachings were interwoven with teachings about epidemiology and statistics and Ceremony guided us through our work together.

Indigenising Research Through Eagle Teachings

The Indigenous authors come from many Nations with many teachings. Our many teachings of the Eagle (Xfgaak [Gitsan], Mikisiw [Woodland

Cree], Migzi [Objibwe], Kitpu [Mi'kmaq], Kehew [Plains Cree]) have banded us together [Figure 2].

The Eagle is our link to the Creator and our connection with the Spirit World. The Eagle flies over us to show us we are walking the right path and brings us peace, strength and safety on our journeys. The Eagle teaches us many lessons. It flies the highest of all birds and can fly above a storm and see many miles ahead. It teaches us not to get caught in the storm of conflict and to welcome all perspectives and sharing of wisdom.

The Eagle Feather is held with great Respect and Ceremony. It is a high honour to receive an Eagle Feather. Throughout our journeys on Building More Bridges, our Feathers are with us.

Two-Eyed Seeing

This study is guided by Two-Eyed Seeing and honours the work of Mi'kmaw Elder, Albert Marshall.²⁶ Two-Eyed seeing is when you can use one eye to see the wisdom provided through Indigenous knowledge and the other eye to see the wisdom provided through settler knowledge systems. This study embodies Two-Eyed seeing and honours the ways of knowing of both Indigenous peoples and settlers and the strong connection between land and knowledge. Expanding on Two-Eyed Seeing, we also strived to achieve Two-Eyed Believing where we valued knowledge from living experience and Two-Eyed Doing where this work aimed to directly benefit Indigenous people living with HIV.²⁷

We enacted Two-Eyed Seeing in a way that centres Indigenous knowledge but also invites non-Indigenous knowledge to contribute strength

and tools to this work. The relationships among Indigenous and non-Indigenous team members were essential to this work which aims to improve rural HIV care for all. We caution our readers that in other contexts, such as research about or for Indigenous Peoples, Two-Eyed Seeing may not be the best approach and one that is guided by Indigenous self-determination is necessary.

METHODS – QUANTITATIVE ANALYSIS

Analysis methods

The Canadian Observational HIV Cohort (CANOC) is a collaboration of 11 clinical cohorts from across 5 Canadian provinces.²⁸ Participating sites submitted de-identified demographic and clinical data to the CANOC data coordinating centre. Participants were eligible for inclusion in CANOC if they were aged 18 and over and initiated combination ART (cART) in or after



Figure 2: Eagle teachings shared by our Indigenous research team members.

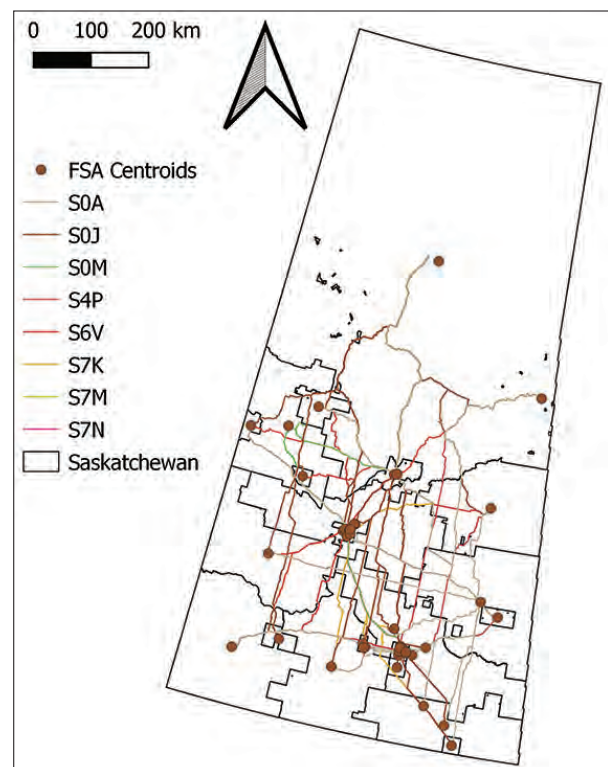


Figure 3: Map of Saskatchewan Forward Sortation Address regions with centroids and shortest driving distance to HIV specialist care locations. This map depicts the Forward Sortation Area boundaries, the centroids within those boundaries and the shortest road distances between centroids.^{38,39} Centroids are the geometric centres of the Forward Sortation Area regions.

Table 1: Demographic and clinical characteristics of participants by category of distance to closest human immunodeficiency virus specialist

	Total (n=406), n (%)	≤25 km to HIV specialist (n=295), n (%)	≤25 km to visiting HIV specialist (n=47), n (%)	26-100 km to HIV specialist (including visiting) (n=27), n (%)	>100 km to closest HIV specialist (including visiting) (n=37), n (%)	P
Distance to HIV care (km)	7 (1-12)	7 (1-9)	1 (1-1)	50 (42-50)	232 (216-232)	<0.001
Distance to CANOC site (km)	11 (7-42)	9 (4-11)	292 (204-631)	50 (42-50)	244 (244-281)	<0.001
Sex						
Male	242 (60)	176 (60)	30 (64)	15 (56)	21 (57)	0.881
Female	164 (40)	119 (40)	17 (36)	12 (44)	16 (43)	
Indigenous						
No	144 (35)	109 (37)	7 (15)	16 (59)	12 (32)	0.001
Yes	232 (57)	162 (55)	37 (79)	11 (41)	22 (59)	
Unknown	30 (7)	24 (8)	3 (6)	0	3 (8)	
Deceased						
No	378 (93)	273 (93)	46 (98)	23 (85)	36 (97)	0.560
Yes	10 (2)	8 (3)	NR	NR	NR	
Missing	18 (4)	14 (5)	NR	NR	NR	
History of IDU*						
No	167 (41)	110 (37)	18 (38)	13 (48)	26 (70)	0.002
Yes	232 (57)	182 (62)	25 (53)	14 (52)	11 (30)	
Unknown	7 (2)	NR	NR	0	0	
Age at ARV initiation (years)	37 (30-44)	37 (30-44)	38 (34-45)	36 (30-46)	39 (34-47)	0.306
Year of ARV initiation	2012 (2010-2014)	2012 (2010-13)	2012 (2011-14)	2013 (2010-13)	2012 (2010-14)	0.454
Baseline	50,454	44,903	75,755	40,950	94,754	0.071
VL (copies/mL)	(13,439-100,010)	(12,146-100,010)	(18,076-100,010)	(6410-97,114)	(29,124-100,010)	
Baseline CD4 (cells/mm ³)	265 (117-422)	264 (120-426)	245 (113-395)	305 (170-490)	220 (50-326)	0.032
Nadir CD4 (cells/mm ³)	215 (80-337)	215 (81-341)	199 (87-307)	278 (155-404)	117 (50-273)	0.055

*History of injection drug use includes individuals with any reported history (past or ongoing) of injection drug use. HIV: Human immunodeficiency virus, CANOC: Canadian HIV observational cohort, IDU: Injection drug use, ARV: Antiretroviral, VL: Viral load, NR: Not reported due to small cell size

2000 and before 1 January, 2016. This analysis was a retrospective analysis of data limited to the Saskatchewan cohort.

Primary explanatory variable – distance from HIV care

Two distinct variables of distance from HIV care were included in separate analyses (Appendix A). The first variable categorised participants based on the closest available HIV specialist care (within 25 km of an HIV specialist, within 25 km of a community where an HIV specialist visits but where no HIV specialist practices permanently, 26–100 km from the closest HIV specialist,

>100 km from the closest HIV specialist). These categories were mutually exclusive as the HIV visiting specialists identified only provided services in communities without a resident HIV specialist. The second was the shortest driving distance between the participants' location of residence and the site where they were enrolled in CANOC and yielded a continuous variable. The two CANOC enrolment sites in Saskatchewan were in Regina and Saskatoon. Distance variables were created using Forward Sortation Area (FSA). Geographic Information Systems (GIS) methods were used to determine the distance from care for each participant based on their FSA [Figure 3]. All GIS analyses were performed using QGIS 3.10.

Table 2: Positive partnership score components and total score by category of distance to closest human immunodeficiency virus specialist

	Total	≤25 km to HIV specialist (n=295), n (%)	≤25 km to visiting HIV specialist (n=47), n (%)	26-100 km to HIV specialist (including visiting) (n=27), n (%)	>100 km to closest HIV specialist (including visiting) (n=37), n (%)	P
Positive partnership score (n=305)*	3 (2-4)	4 (3-4)	3 (2-3)	4 (3-5)	3 (2-4)	<0.001
Number of CD4 count tests**						
<3	199 (49)	147 (50)	24 (51)	5 (19)	23 (62)	0.004
≥3	207 (51)	148 (50)	23 (49)	22 (81)	14 (38)	
Number of viral load tests**						
<3	202 (50)	140 (47)	31 (66)	6 (22)	25 (68)	<0.001
≥3	204 (50)	155 (53)	16 (34)	21 (78)	12 (32)	
Baseline CD4						
<200 cells/mm ³	146 (36)	103 (35)	18 (38)	7 (26)	18 (49)	0.270
≥200 cells/mm ³	260 (64)	192 (65)	29 (62)	20 (74)	19 (51)	
Started nonrecommended ART***						
Yes	33 (8)	21 (7)	8 (17)	0	NR	0.043
No	373 (92)	274 (93)	39 (83)	27 (100)	NR	
VL suppressed****						
Yes	126 (31)	95 (32)	8 (17)	14 (52)	9 (24)	0.053
No	179 (44)	125 (42)	28 (60)	12 (44)	14 (38)	
Unknown	101 (25)	75 (25)	11 (23)	NR	14 (38)	

*Reported as median and interquartile range. Possible score range: 0-5, **In the year following ART initiation, ***Based on the contemporary International AIDS Society Guidelines at the time of ART initiation,³⁰ ****Was suppressed at 6 months (2 consecutive VL <50 at least 30 days apart). HIV: Human immunodeficiency virus, ART: Antiretroviral therapy, VL: Viral load, NR: Not reported due to small cell size

Table 3: Univariate and multivariable linear regression model positive partnership score onto predictors with categorical geographic variables (n=276)

	Unadjusted		Adjusted	
	Estimate (95% CI)	P	Estimate (95% CI)	P
Distance between home and closest HIV care service				
≤25 km to HIV specialist	Reference	0.001	Reference	0.004
≤25 km to visiting HIV specialist	-0.59 (-1.06--0.12)		-0.51 (-0.97--0.06)	
26-100 km to HIV specialist (including visiting)	0.47 (-0.01-0.96)		0.37 (-0.1-0.83)	
>100 km to closest HIV specialist (including visiting)	-0.65 (-1.2--0.1)		-0.65 (-1.18--0.12)	
Indigenous				
No	Reference	0.003	Reference	0.002
Yes	-0.44 (-0.73--0.15)		-0.45 (-0.74--0.17)	
Year of first ARV initiation	0.04 (-0.02-0.09)	0.200	0.08 (0.02-0.13)	0.005
Number of years living with HIV at baseline	-0.08 (-0.14--0.02)	0.011	-0.09 (-0.15--0.03)	0.005
Identifies as heterosexual				
No	Reference	0.003	Reference	0.003
Yes	0.44 (0.15-0.73)		0.43 (0.15-0.7)	

CI: Confidence interval, HIV: Human immunodeficiency virus, ARV: Antiretroviral

Outcomes

The outcome was a composite score which we named the 'Positive Partnership Score (PPS)'. It was a modified version of the Programmatic

Compliance Score scoring system which measures how well an individual receives guideline-based HIV care and has been validated to predict mortality.²⁹ Our team collectively decided to invert the scoring criteria to use a strength-based

Table 4: Univariate and Multivariable linear regression model positive partnership score onto predictors with road distance between home and Canadian Observational human immunodeficiency virus Cohort enrolment site as geographic variables (n=276)

	Unadjusted		Adjusted	
	Estimate (95%CI)	P	Estimate (95%CI)	P
Distance between home and enrolment site (per 10 km)	-0.02 (-0.03--0.01)	0.004	-0.01 (-0.02-0)	0.024
Indigenous				
No	Reference	0.003	Reference	0.001
Yes	-0.44 (-0.73--0.15)		-0.48 (-0.77--0.2)	
Year of first ARV initiation	0.04 (-0.02-0.09)	0.200	0.07 (0.02-0.13)	0.010
Number of years living with HIV at baseline	-0.08 (-0.14--0.02)	0.011	-0.09 (-0.15--0.03)	0.004
Identifies as heterosexual				
No	Reference	0.003	Reference	0.004
Yes	0.44 (0.15-0.73)		0.41 (0.13-0.69)	

CI: Confidence interval, HIV: Human immunodeficiency virus, ARV: Antiretroviral

Table 5: Policy recommendations based on study results

Recommendations	Rationale
Change the practice of displaying an "R" on health cards in Saskatchewan	Many Indigenous people in Saskatchewan experience racism when they try to access health care. The 'R' on health cards automatically identifies individuals as Indigenous without giving them the options to self-identify or not
Increase engagement of pharmacies as HIV care providers and provide the necessary education and support so they can deliver safer HIV care rather than acting as a potential barrier to HIV care	In rural areas, pharmacies may not be familiar with antiretroviral medication and the importance of ensuring a supply without interruption. Increased education and engagement of pharmacies can help to ensure equitable access to antiretroviral medication
Increase peer supports and community-based organisational supports for people living with HIV in rural areas	Peer support is a key component of holistic HIV care. Peer support services are often offered through AIDS Service Organisations which often do not have services in rural communities
Minimise travel burden for people living with HIV. For example, by: <ul style="list-style-type: none"> a. Coordinating appointments for laboratory, physicians and pharmacy into one trip b. Working with pharmacies in small communities to ensure uninterrupted ARV supply and safer care environments close to home c. Providing early advanced notice of visiting specialist schedules d. Providing options for individuals to receive medications by mail e. Allowing dispensation of longer duration of medication refills, especially for individuals with stable HIV f. Offering shuttles or low-cost transportation options to all health-related services 	Individuals living with HIV may need to travel outside of their home communities to receive many different aspects of HIV care including physician assessments, peer support, laboratory investigations, medication pick-up and additional holistic services
Ensure that patients have a choice of several providers (for example, through the creation of an HIV provider directory) so they can receive care from someone they are comfortable with rather than the closest available provider	Some people living with HIV may not feel comfortable with certain providers. In rural areas, there may only be one local provider and if this provider does not have a strong relationship with clients, this can act as a major barrier to care
Support education on trauma-informed care for rural practitioners	Culturally safer, trauma-informed care should be provided universally, including rural communities

HIV: Human immunodeficiency virus, ARV: Antiretroviral, AIDS: Acquired Immune Deficiency Syndrome

approach rather than a deficit-based measurement tool and to acknowledge that HIV care is a

partnership amongst people living with HIV and care providers. One element of the score was

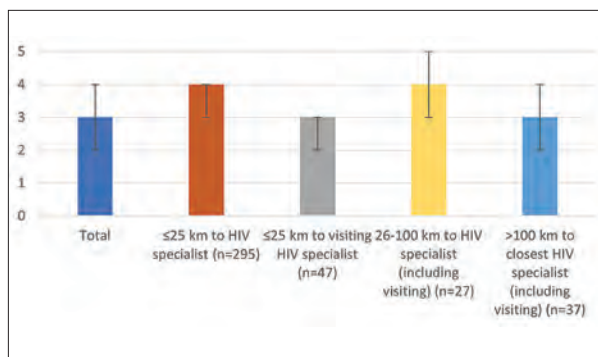


Figure 4: Positive Partnership Score by geographic category. Displays Positive Partnership Score values along with 95% confidence intervals by geographic category.

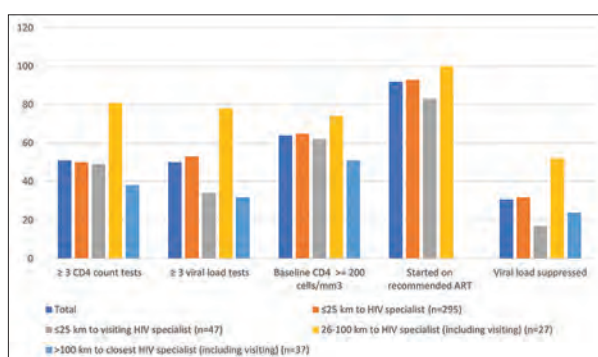


Figure 5: Positive Partnership Score components by geographic category. This graph depicts the proportion of individuals in each geographic category that achieve the care markers included in the Positive Partnership Score. A number of CD4 count and viral load tests are measured in the first year after ART start. Recommended ART is based on the contemporary International AIDS Society Guidelines at the time of ART initiation.⁵⁰ Virologic suppression was defined as 2 consecutive viral load measurements of <50 copies/mL measured at least 30 days apart within 6 months of starting ART. Data on starting recommended ART are not presented for one geographic category due to small cell sizes and privacy regulations.

omitted due to the lack of data availability on baseline HIV resistance testing. The PPS included five elements, and a point was given for each element, allowing for score ranges of 0–5 where a higher score indicated better guideline-based HIV care. The elements were: (1) receiving three or more CD4 counts in the 1st year of cART; (2) receiving three or more viral load tests in the 1st year of cART; (3) starting cART with a baseline CD4 count ≥ 200 cells/mm³; (4) beginning cART with a guideline-based regimen based on the contemporary International Antiviral Society guidelines at the time of cART initiation⁵⁰ and (5) achieving virologic suppression within 6 months of ART initiation.

Statistical methods

Descriptive statistics were performed for all characteristics by distance from HIV care category and reported as frequencies and proportions for categorical variables and medians and interquartile range for continuous variables. Categorical variables were compared using a Chi-squared test or Fisher's exact test. Continuous variables were compared using Kruskal–Wallis test. Statistical analyses were conducted using SAS v9.4 (SAS Institute, North Carolina, USA).

Linear regression models were developed to examine the effect of distance to HIV care on the PPS. A change in estimate method was used to select confounding covariates for inclusion in the final multivariable models. Indigenous identity was self-reported which represents the gold standard for Indigenous identification.³¹ Two models were developed using the continuous and categorical geographic variables described above.

RESULTS

A total of 276 individuals were included in the analyses. Characteristics by geographic category are presented in Tables 1 and 2. PPSs were lower among individuals living within 25 km of a visiting HIV specialist (but no permanent specialist) and those living >100 km from any HIV specialist. Figures 4 and 5 present overall PPS and its components by geographic category.

In multivariable regression analysis, distance from care was associated with lower PPSs [Tables 3 and 4]. Living ≤ 25 km from a visiting HIV specialist (but no permanent specialist) and living >100 km from the closest HIV specialist were both associated with a lower PPS. When examining road distance from a CANOC enrolling site, each 10 km further from the site of CANOC enrolment was associated with a 0.01-point reduction (95% CI -0.02, 0; $P = 0.024$) in PPS. A distance of 500 km was associated with a 0.5-point reduction in PPS.

The Indigenous people living with HIV on our research team offered several policy recommendations to improve HIV care in Saskatchewan [Table 5]. These included (1) changing the practice of displaying an 'R' on health cards in Saskatchewan; (2) educating and engaging pharmacists in HIV care; (3) increasing peer support; (4) reducing travel burden and (5) ensuring safe and trauma-informed care.

DISCUSSION

Distance from HIV care was independently associated with lower PPSs using two different methods of quantifying distance to care. These findings contribute to the existing body of literature on geographic health disparities and are concordant with prior studies demonstrating associations between distance to care and negative health outcomes.³²⁻³⁴ There was a linear association between increased distance and lower PPSs which suggests that there is heterogeneity amongst rural areas and that degree of rurality or remoteness is an important factor. Similarly, a linear association has been demonstrated between distance to care and mortality in life-threatening emergencies.³³

Interestingly, in the categorical analysis, individuals living within 25 km of a visiting HIV specialist also had lower PPSs. This suggests that physician or specialist access alone is not sufficient to optimise HIV-related care and outcomes and that many other factors likely contribute to health inequities. Addressing structural factors such as racism, colonialism and poverty need to complement efforts to improve service delivery to tackle the root causes of health inequity.³⁵

In addition to the main findings of these analyses, several other findings are important to highlight gaps in care. The first is that across all groups, the baseline CD4 count was low, which draws attention to the need for increased HIV testing and earlier diagnosis of HIV.³⁶ The second is that overall, mortality rates were low in this cohort, which suggests that individuals who are linked with care do well. Increased efforts to link and retain individuals in care needs to be a priority for HIV programming and service planning.

The relationship between rurality and health outcomes is complex and multifactorial. Specific to this analysis, important drivers include HIV-related stigma as well as the intersection of HIV-related stigma and racism. Members of our research team have experienced stigma and racism accessing healthcare which is magnified after they have presented their health cards that are labelled with 'R' to indicate they are a 'status Indian'.³⁷ This affects their ability to receive safe care in emergency departments and pharmacies when they are trying to pick up their ARVs

(antiretroviral). In addition to stigma faced by individuals when they pick up their ARVs, interruptions in ARV supply in rural pharmacies can also contribute to treatment interruptions and poorer HIV outcomes.

Strengths

The engagement of Indigenous people living with HIV as research team members was the greatest strength of this study. Ceremony, working with and on the land, and Indigenous leadership enabled this engagement to occur in a meaningful way and the trust and relationships that our team built were critical to this work. Our living experience and understanding of the challenges of receiving HIV care, particularly in rural areas, helped to contextualise the findings and generate recommendations that are relevant within a Saskatchewan context.

Limitations

A significant limitation of this study is the risk for misclassification bias for variables including place of residence which may change over time and history of injection drug use which may not be disclosed due to stigma or mistrust of providers. Furthermore, a dichotomised variable of IDU (injecting drug users) or non-IDU fails to identify those who are in remission. This is an important distinction as it also honours an individual's recovery journey.

Future directions

There is little controversy in the literature that rural populations have poorer health outcomes across a spectrum of health conditions. While additional research in this area will help to document these discrepancies in academic literature and support advocacy for policy change, what is called for is action [Table 5].

CONCLUSIONS

Through a strength-based approach that was grounded in culture, connection, land and Ceremony, we demonstrated how Indigenous people living with HIV can play a key role in HIV research. The results of this study identified the

need for better HIV care in rural areas and found that distance from care can be associated with lower markers of quality HIV care. This highlights the importance of addressing health inequities in rural and remote areas and that Indigenous people living with HIV carry the knowledge needed to develop practical and impactful solutions.

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Appendix A: Methodology to determine distance to care

CANOC includes Forward Sortation Area (FSA) as geographic data for participants. Although this aggregate spatial data lacks precision in comparison to point data such as a street address, it allows for greater privacy of participants.³⁸ Geographic Information Systems (GIS) methods were used to determine distance from care for each participant based on their FSA. All GIS analyses were performed using QGIS 3.10. The Statistics Canada Road Network File 2016 and FSA Boundary File 2016 open access GIS shapefiles were used to calculate distances.^{38,39} The 2016 versions were selected as they contained the most recent data at the end of the study observation period.

Two methods were used to calculate distance from HIV care. The first method calculated the shortest driving distance between the participants' location of residence and the site where they were enrolled in CANOC and yielded a continuous variable. The second method categorized participants into four prespecified categories based on their shortest driving distance to the closest location where HIV specialist services were available during the study period. The categories, which were defined by members of the research team who are people living with HIV in Saskatchewan included:

- Living within 25 km of an HIV specialist
- Living within 25 km of a community where an HIV specialist visits (but not within 25 km of where an HIV specialist primarily practices)
- Living between 26 and 100 km of the closest HIV specialist or community where an HIV specialist visits
- Living over 100 km from the closest HIV specialist or community where an HIV specialist visits.

To determine the location of specialist HIV care services, providers in Saskatchewan were contacted by telephone, email, and paper survey to determine their location of practice as well as outreach HIV services provided in other communities in Saskatchewan. The physician directory of the College of Physicians and Surgeons of Saskatchewan was also used to identify Infectious Diseases specialists who had an active, locum or provisional license as of December 31, 2016. Practice locations were classified as primary practice location or outreach practice location based on the setting where they provided most of their services. This process identified primary practice locations for specialist HIV care in Regina (S4P) and Saskatoon (S7K, S7M, S7N) and outreach services in Prince Albert (S6V), Touchwood Agency Tribal Council First Nations (S0A), and Northern Saskatchewan (S0J).

For both methods, the centroid (geometric centre) was calculated for each FSA. Network analysis was performed using the road network file to calculate the shortest driving path from each FSA centroid to the practice locations reported above (seven distinct centroids) or the enrolment sites [Figure 3]. Distances were rounded to the nearest kilometre. For the categorical variable, the shortest distance of the seven was selected as the distance to closest care. The distance to care for the FSAs containing practice locations was set to 1 km (lowest non-zero integer).

Increasing diabetes testing adherence with incentives in rural Northwestern Ontario

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Abstract

Introduction: The health outcomes of rural Canadians have been described as poor and can in some part be related to diabetes mellitus. Despite the high mortality and morbidity rates associated with the disease, compliance with management remains low. Research has shown that a small financial incentive used to modify patient behaviour, can improve outcomes in cardiac disease and exercise adherence. This study aims to evaluate if a small financial incentive awarded to rural Northwestern Ontario patients with diabetes who complete an haemoglobin A1c (HbA1c) test, would result in greater compliance in test completion.

Methods: Patients were recruited through two Northern rural clinics. Participants were divided into two groups: Group A received a financial incentive, whereas Group B received a letter of reminder. HbA1c tests were recorded every 6 months for 2 years and compliance was analysed using a *t*-test and Chi-square.

Results: One hundred and forty-six participants were recruited with 30 lost to follow-up. Overall, the incentive group completed a statistically significantly higher number of HbA1c tests compared to those in the control group. In addition, it was noted that there was an increase in test adherence for participants that received reminder letters, although not an initially expected outcome of the study.

Conclusion: The results suggest that either a financial incentive or a reminder directed towards rural Canadians could have a benefit in promoting health behaviours to subsequent medical management of diabetes mellitus.

Keywords: Diabetes, financial incentives, HbA1c test, rural medicine

Résumé

Introduction: Les résultats en matière de santé des Canadiennes et Canadiens vivant en milieu rural ont été décrits comme médiocres et peuvent en partie être liés au diabète sucré. Malgré les taux élevés de mortalité et de morbidité associés à cette maladie, l'observance du traitement reste faible. La recherche a montré qu'un petit incitatif financier utilisé pour modifier le comportement du patient, peut améliorer les résultats dans les maladies cardiaques et l'adhésion à l'exercice. Cette étude vise à évaluer si une petite incitation financière accordée aux patients diabétiques des régions rurales du nord-ouest de l'Ontario qui effectuent un test HbA1c, entraînerait une plus grande conformité dans l'exécution du test.

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Méthodes: Les patients ont été recrutés dans deux cliniques rurales du nord. Les participants ont été divisés en deux groupes: Le groupe A a reçu une incitation financière, tandis que le groupe B a reçu une lettre de rappel. Les tests HbA1c ont été enregistrés tous les 6 mois pendant 2 ans et la conformité a été analysée à l'aide d'un test t et d'un chi carré.

Résultats: 146 participants ont été recrutés, dont 30 ont été perdus lors du suivi. Dans l'ensemble, le groupe incitatif a réalisé un nombre statistiquement significatif de tests d'HbA1c par rapport aux participants du groupe témoin. De plus, une augmentation de l'adhésion aux tests a été remarquée pour les participants qui ont reçu des lettres de rappel, bien que ce ne soit pas un résultat initial attendu de l'étude.

Conclusion: Les résultats suggèrent que soit une incitation financière, soit un rappel destiné aux Canadiennes et Canadiens des zones rurales pourrait avoir un avantage dans la promotion des comportements de santé pour la gestion médicale ultérieure du diabète sucré.

Mots-clés: Gestion du diabète sucré, incitation financière, médecine rurale, test HbA1c

INTRODUCTION

Diabetes mellitus is one of the leading causes of morbidity and mortality in Canada. The abnormal insulin activity in diabetes results in hyperglycaemia, which is the causative factor in its downstream effects.¹ Type II diabetes, previously called 'adult-onset' diabetes, is responsible for 90% of cases.² Risk factors for type II diabetes include poor diet with the consumption of high glycaemic index foods, sedentary lifestyles with a lack of exercise and genetics.² There are a number of sequelae in patients with diabetes, which affect multiple organ systems, most notably causing cardiovascular and renal diseases.¹ Due to the increase in mortality associated with these diseases, correct management of diabetes is vital. However, high rates of poor compliance to management adherence have resulted in large costs to the health-care system, which when calculated in 2012 over a 10-year time span, yielded approximately \$15 billion dollars.³ There is also evidence to suggest that directing risk reduction procedures towards those who are at the highest risk could save up to \$1.48 billion over the same time period.³

Overall, the management of diabetes is multifactorial and typically includes medical and lifestyle changes.² However, alongside these two is an emerging topic known as behavioural changes. Behavioural changes include modifications that can alter human behaviour and improve outcomes.⁴ Diabetes is no different and there are emerging goals to refine the way diabetes care is delivered to incorporate a more holistic approach

that also includes a behavioural aspect.^{4,5} One method to altering behaviour is through gifts, financial incentives or encouraging reminders. Previously, the Ontario government introduced financial incentives for physicians with a diabetes incentive billing code in 2002.⁶ However, there were no associated improvements in diabetes care with the involvement of physician incentives. When focusing on the patient, financial incentives have had the ability to alter behaviours and increase adherence relating to exercise regimens and healthy cardiac behaviours; two fields closely related to diabetes prevalence.^{7,8} Similarly, a pilot study in Wisconsin demonstrated early evidence of incentives focusing on increased diabetes testing adherence.⁹ Therefore, there may be an association between financial incentives focused on patients rather than physicians, and improved outcomes in diabetes management with regard to testing. However, this research was mostly done internationally. In Canada, there has been little research into the effects of patient-focused incentives for diabetes management in rural areas.

Rural Canadians have unique health issues when compared to their urban counterparts. There are higher self-reported 'poor' health outcomes, including obesity, and dietary habits, as well as 'poor' health literacy status.¹⁰ Cumulatively, this can result in poor adherence to disease management, such as diabetes.¹⁰ This increases the risk of sequelae, which eventually leads to a larger burden on the health-care system. Northwestern Ontario (NWO) is no different, being that it is a geographically vast area with

unique health concerns. The rate of diabetes in the adult population is significantly higher than the Ontario average, at 14.4% compared to 12.6%, respectively.¹¹ This is evidence that the region is at significant risk of poor outcomes with inadequate management of chronic diseases with diabetes being no different.

Past evidence has shown that small financial incentives have the ability to improve outcomes in cardiac disease and exercise adherence, due to modification of patient behaviour. The Canadian Diabetes Association (CDA) recommends measuring haemoglobin A1c (HbA1c) every 3 months (or 120 days), to correctly determine overall management in patients with diabetes.³ The purpose of our research study was to evaluate if small financial incentives awarded to rural NWO patients with diabetes, who complete an HbA1c test, would result in greater compliance in test completion. This is a large step in diabetes management, and if a link exists, it could create a potential target for stronger diabetes management and decreased health-care costs. It is hypothesised that those who receive an incentive for every HbA1c test over a 2-year period, would have an increase in the number of tests completed when compared to a control group.

METHODS

Study design

Participants in the study were split into two groups, with 'Group A' receiving an incentive, and 'Group B' being the control. Every 6 months from the onset of the study, a letter was mailed to the participants. The letter was a reminder of their enrolment in the study and included a 'checkbox' for them to fill in if they completed any HbA1c blood tests in that time period up to a maximum of two tests. Patient completion of A1c testing was identified using their electronic medical record. Nomenclature in the letter was encouraging and was designed to foster a positive attitude towards diabetes testing. Participants in 'Group A' would also receive a \$5 gift card to a small local business, for every HbA1c test they had completed in that time period (up to a maximum of two tests, or two gift cards), thus being named the 'incentive group'. At the completion of the study, a final reminder was sent.

Recruitment

Patients were recruited at two clinics in NWO, including the Dingwall Medical Group in Dryden and the Machin Medical Clinic in Vermillion Bay. Recruitment took place over a 3-year period. Participants were randomised to their respective groups using a simple randomisation technique to either 'Group A' or 'Group B' upon entry to the study. Recruiters and study investigators were not blinded to their group status, whereas their primary care practitioners were not involved in the study randomisation and therefore were blinded to their status.

Inclusion criteria included any patients above the age of 18 who had their primary address in the Dryden or Machin region, with a primary care physician in the same jurisdiction, as well as a history of type 1 or 2 diabetes mellitus. Exclusion criteria included those under the age of 18, those with a diagnosis of gestational diabetes and those who did not reside or have a primary care physician in the aforementioned region. Those who were lost to follow-up and did not complete the full 2 years of the study were not accounted for in the number of HbA1c tests. Indigenous Northwestern Ontarians were recruited to the study but were randomised in the same way as other patients; there was no specific recruiting pattern for Indigenous people.

Measuring outcomes and statistics

HbA1c tests were recorded every 6 months and collated onto a master spreadsheet without patient identifiers. Group A was compared to Group B in regard to total HbA1c tests completed over the 2-year period using a *t*-test analysis ($P < 0.10$), as well as the total proportion of tests completed over the total time period and proportion of tests completed at each time period, using a Chi-squared analysis ($P < 0.05$).

Ethics

Research ethics was provided by the Lakehead Research Ethics Board in Thunder Bay, ON, for the duration of the study from September 2016 to September 2019. The information from the study will be kept in a secure location until September 2024, 5 years after its completion date. Access to

patient health information was granted by the Dryden Regional Health Sciences Centre and the Dryden Dingwall Clinic.

RESULTS

Participants

A total of 146 participants were found to be eligible for the study in the two communities of Dryden and Machine between September 2016 and September 2019. One hundred and sixteen participants were from the Dingwall Clinic in Dryden and a further 30 from the Machin Medical Clinic in Vermillion Bay [Table 1]. One hundred and sixteen of 146 participants completed the study, with 30 lost to follow-up. Sixty participants who completed the study were randomised to the incentive group, with the remaining 56 assigned to the control group. Patient demographics were retrieved using self-reported information which included age, gender, ethnicity, type of diabetes and self-reported last A1c test before the study started. One hundred and twenty-five patients completed their patient demographic information, which included the 116 patients, who completed this study, as well as the five patients who emigrated and four who died. This information was not assessed on the deceased patient, the one patient who withdrew, and all 19 of those lost to logistical reasons, as they did not complete the survey.

HbA1c blood tests conducted

Over the 2-year time period, there were 461 total HbA1c tests completed in both groups, with 257 out of a possible 480 (60 participants with a maximum of 8 tests in 2 years maximal possible total of 480 tests) completed in the incentive group and 204 out of a possible 448 (56 participants with a maximum of 8 tests in 2 years equals a maximal possible total of 448 tests) in the control group; the incentive group was statistically higher when using a Chi-squared analysis [$P < 0.05$; Table 2]. At each time point, there were statistically insignificant trends of greater tests completed in the incentive group when compared to the control group except for the first period at 0–3 months [$P < 0.10$; Table 2]. When comparing the total number of tests in each time period, those completed after

Table 1: Characteristics of participant and recruitment profile of type 2 diabetes mellitus patients at the Dingwall clinic in Dryden and the Machin Clinic in vermillion bay

Total number of participants recruited per site (n=146)		
Cohort	Dryden	Machin
Cohort 1	23	18
September 2016-2018		
Cohort 2	38	5
December 2016-2018		
Cohort 3	14	0
May 2017-2019		
Cohort 4	22	7
September 2017-2019		
Cohort 5	19	0
Planned February 2019-2021; not completed due to logistical reasons		
Total	116	30
Participant status (n=146)		
Total recruited	146	
Total loss to follow-up	30	
Voluntarily withdrew	1	
Emigrated	5	
Deceased	5	
Lost due to logistical reasons	19	
Totally completed the study	116	
Patient demographics (n=125)		
Gender		
Male	58	
Female	67	
Age		
18-25	1	
26-35	3	
36-45	8	
46-55	23	
56-65	32	
65-75	38	
75+	20	
Ethnicity		
First Nations, Inuit or Metis	30	
Caucasian	77	
Black	0	
Asian	1	
Other	11	
Prefer not to answer/left blank	6	
Type of diabetes		
Type 1	0	
Type 2	124	
Unsure	1	
Time since last known A1c (self-reported)		
<3 months	86	
4-6 months	14	

Contd...

Table 1: Contd...

Patient demographics (n=125)	
7-12 months	7
12+ months	8
Never	7
Unsure	3

reminders were mailed to both groups at 12 and 18 months, resulted in a statistically significantly higher number of completed tests [$P < 0.05$; Figure 1]. However, there was no influence on incentives alone, for these same time points.

DISCUSSION

Incentives and HbA1c testing frequency

Overall, it is observed that the incentive group completed statistically significantly higher numbers of HbA1c tests than those in the control group over the course of the study period, with both a higher complete number and higher mean of tests completed. There was no significant pattern of increased testing at specific time points in the incentive group when compared to the control. However, there were trends pointing to this, suggesting that small sample size could have influenced the lack of significance. Based on this, even in this small study with 116 participants, there was evidence that small financial incentives can increase the likelihood of completing an HbA1c blood test. This is what was hypothesised, with the goal being that behavioural modification with these small financial incentives would increase the likelihood of patients initiating their own HbA1c blood tests. Although there was no goal of the study to determine if primary practitioners had played a role in testing adherence, there was no evidence to suggest another variable played a role in the higher rates seen, as all participants were randomised to either group to reduce this possible confounder.

Including those who received incentives, there were a significantly lower average number of tests completed in either group over the 2-year period, with an average of 4.23 in the incentive group and 3.65 in the control group, compared to the recommended number of tests by the CDA. The CDA recommends eight tests be conducted in this time period, suggesting that both groups are not

conforming to the current guidelines regardless of incentive strategy.² There was a benefit of small financial incentives on overall testing adherence, thus identifying a potential strategy of patient direct incentives as an adjunct or replacement for current physician-gearred incentives. Sixty-nine per cent of participants in the study did indicate on a survey that they had completed an HbA1c in the past 3 months at the start of the study. This, however, was self-reported data and was not corroborated by the patient record as it was out of the original scope of the project. Incentives could be a step towards increasing diabetes health literacy and potentially management, further downstream with rural Canadians. The aforementioned billing code for diabetes was introduced for Ontario physicians in 2002 and did not show any benefit when the financial incentive was geared towards physicians.⁶

This is evidence that even in a small group study, financial incentives may have benefit in creating behavioural changes by creating a bridge between health management and finances. Regular blood tests may often be viewed as an inconvenience or as something that is not of importance to a patient with diabetes. However, if getting a blood test may benefit them, such as by receiving a gift card, they may be more willing to conduct this test, which may eventually lead to increased awareness surrounding their diabetes management. The incentive could remove the aspect of inconvenience and could be a model to further explore human behaviours in healthcare. Diabetes management is a multifactorial process. If involving a small financial aspect in its management results in some benefit, this could potentially reduce downstream health-care costs associated with morbidity and mortality of sequelae to a small degree. Even in the face of small financial incentives, this could be significant.

Limitations

Given the study's small sample size and the single recruitment centre, there are a number of associated limitations. Most of these limitations are due to a lack of external validity and an inability to truly extrapolate the data to other settings or sites. There is the possibility of confounding variables, such as the involvement of diabetes educators and differing advice of

Table 2: Total number of HbA1c blood tests conducted in Northwestern Ontario patients with diabetes enrolled in the study at the end of the study, and at either time point

	Incentive (n=60)	Control (n=56)	P	
Total number of tests completed	257	204	<0.05*	
Proportion of total tests completed	0.53	0.45	<0.10[#]	
Average number of tests completed	4.23±2.18	3.65±2.01	<0.10[#]	
Time period	Incentive (n=60)	Control (n=56)	Total	P
Period 1 (0-3 months)	35	24	59 ^{ab}	<0.10[*]
Period 2 (4-6 months)	31	23	54 ^{ab}	=0.16
Period 3 (7-9 months)	34	29	63 ^a	=0.36
Period 4 (10-12 months)	28	22	50 ^b	=0.23
Period 5 (13-15 months)	37	28	65 ^a	=0.10
Period 6 (16-18 months)	25	21	46 ^b	=0.32
Period 7 (19-21 months)	34	28	62 ^a	=0.23
Period 8 (22-24 months)	33	29	62 ^a	=0.36

Bold=Statistically significant. *Statistically significant using Fischer's exact test with $P<0.05$, [#]Statistically different using a t -test with $\alpha=0.10$, [^]Statistically different using Fischer's exact test with $P<0.10$, a is statistically significant from b using Fischer's exact test with $P<0.05$

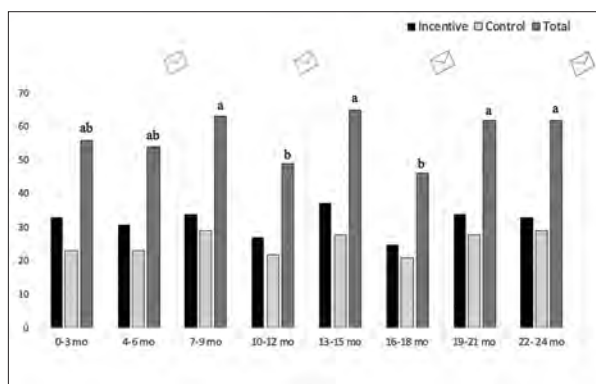


Figure 1: Comparing the number of tests completed in the incentive and control groups, as well as the total number of tests at each time period. Envelopes denote time points at which reminders were sent to either group, at 6-month intervals. *a* is statistically significant from *b* using Fischer's exact test with $P < 0.05$.

primary care practitioner's on the frequency of diabetes testing. Therefore, this study may not represent all rural centres. Randomisation should limit any confounding of this on eventual results; however, as a whole, the data should be interpreted as such.

An unexpected by-product of this study was data that could suggest reminders alone could increase the number of A1c tests completed. This was identified at 2 separate time periods when looking at the total number of tests completed, thus showing the potential role of reminders alone, in an increasing volume of HbA1c testing. However, this was not a primary outcome of the original study design, and therefore cannot be analysed. This does however open the door to a potential

intervention that could be used in future studies examining the behaviours of diabetes and chronic disease management. For example, a future study could examine the effects of reminders alone, by comparing them to incentives and a control group. This study was not designed to investigate the effect of reminders against control, and this finding was just noticed in the interpretation of the data, so therefore cannot be definitively commented on.

CONCLUSION

Overall, in a study of rural Canadians focusing on the effectiveness of financial incentives in improving diabetes testing adherence, there was a mild benefit from financial incentives as compared to the control group. However, another finding was that all participants who received a reminder, with or without incentives, had a higher number of tests than in the subsequent time period. This shows that either incentives or a reminder alone could have a benefit in promoting health behaviours to subsequent medical management, which would need to be explored further in future research. Closer knowledge of diabetes management could lead to important effects in the future, with improved management of chronic diseases, which could lead to benefits on the health-care costs associated with the disease burden in rural Canadians; follow-up studies will be required to make this association.

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Conflicts of interest: There are no conflicts of interest.

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Examining the status of rural post-graduate family medicine education

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Abstract

Introduction: Rural populations in Canada are generally in worse health when compared to their urban counterparts. In 2014, the College of Family Physicians of Canada and the Society of Rural Physicians of Canada formed a joint Task force to advocate for improved health in rural communities. As a task force, they developed the Rural Road Map for Action. This paper uses the Rural Road Map for Action as a framework to examine the current state of family medicine's Post-Graduate Medical Education (PGME) in Canada.

Methods: Surveys were sent to the programme directors of all English- and French-speaking post-graduate family medicine programmes. Both quantitative and qualitative methods were used to analyse survey responses.

Results: Thirteen of 17 respondents completed the questionnaire. Despite on-going efforts, our results suggest that few programmes have equity and diversity admission's policies for rural and Indigenous students; a gap exists between the number of residents who are educated in rural areas and those who end up practising in rural areas; residents lack skills in Indigenous health; and more funded professional development opportunities are needed for rural physicians.

Conclusion: Rural healthcare concerns are typically under-represented in PGME. The Rural Road Map for Action brings focus to the specific healthcare needs of rural areas, highlighting a recruitment and retention strategy that aligns education, practice, policy and research activities. Medical schools and national physician organisations need to continue to advocate for the health of rural communities through increasing the rural physician workforce and providing appropriate training for rural practice.

Keywords: Rural health, rural medical education, rural road map for action

Résumé

Introduction: Les populations rurales du Canada sont généralement en moins bonne santé que leurs homologues urbaines. En 2014, le Collège des médecins de famille du Canada et la Société de la médecine rurale du Canada ont formé un groupe de travail conjoint pour défendre l'amélioration de la santé dans les collectivités rurales. En tant que groupe de travail, ils ont élaboré le Plan d'action pour la médecine rurale. Le présent document utilise ce Plan comme cadre pour

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examiner l'état actuel de la formation médicale postuniversitaire (FMP) de la médecine familiale au Canada.

Méthodes: Les enquêtes ont été envoyées aux directeurs de programme de tous les programmes de médecine familiale postuniversitaire anglophones et francophones. Des méthodes quantitatives et qualitatives ont été utilisées pour analyser les réponses.

Résultats: Treize des 17 répondants ont rempli le questionnaire. Malgré les efforts en cours, nos résultats suggèrent que peu de programmes ont des politiques d'admission en matière d'équité et de diversité pour les étudiants ruraux et autochtones; un écart existe entre le nombre de résidents qui sont formés dans les zones rurales et ceux qui finissent par exercer dans ces zones; les résidents manquent de compétences en matière de santé autochtone et; que davantage d'opportunités de développement professionnel financées sont nécessaires pour les médecins ruraux.

Conclusion: Les préoccupations relatives aux soins de santé en milieu rural sont généralement sous-représentées dans la FMP. Le Plan d'action pour la médecine rurale met l'accent sur les besoins spécifiques des zones rurales en matière de soins de santé, en soulignant une stratégie de recrutement et de rétention qui aligne les activités d'éducation, de pratique, de politique et de recherche. Les facultés de médecine et les organisations nationales de médecins doivent continuer à défendre la santé des collectivités rurales en augmentant le nombre de médecins ruraux et en offrant une formation appropriée à la pratique rurale.

Mots-clés: éducation médicale rurale, plan d'action pour la médecine rurale, santé rurale

INTRODUCTION

People living in rural areas are commonly less healthy and experience worse health outcomes when compared to individuals residing in more urban settings. Such disproportionate health issues in rural areas include higher death rates from suicide, increased mortality from cardiorespiratory diseases and higher rates of smoking and obesity.¹ To improve these health-related outcomes, people living in rural areas must have access to healthcare professionals. However, rural areas in Canada continue to struggle with the recruitment and retention of these professionals.^{2,3} With a significant proportion of Canadians living in rural areas, it is necessary that Canada continues to work towards a healthcare system which is founded on the principles of comprehensive, portable, universal, accessible and publicly administered care for all Canadians.⁴

In 1999, a report was authored by the College of Family Physicians of Canada (CFPC) on Post-graduate Education for Rural Family Practice that advised on what needed to be done to prepare physicians for the challenges of rural practice.⁵ The report focused on core post-graduate education, special rural family medicine skills and advanced family medicine skills. Recognizing that challenges with rural health persisted, the CFPC and the Society of Rural Physicians of Canada (SRPC) formed a joint Task force focused on increasing the number of family physicians practising in

rural communities and improving the health of rural Canadians.⁶ As part of this work, the CFPC and SRPC commissioned a background paper to provide an overview on the implementation of the 1999 report. The background paper suggested that some strides have been made but more could be done to support and train rural family physicians.⁷

Medical schools have demonstrated a growing commitment towards social accountability to address population need and to support equity, diversity and inclusion for those entering medical school. This is evidenced in the vision statement for social accountability released by the Associations of Faculties of Medicine of Canada (AFMC) in 2001 and later in the commitment made by a consortium of medical organizations working with the AFMC in the Future of Medical Education in Canada MD and post-graduate medical education (PGME).⁸⁻¹⁰ The CFPC and SRPC felt an important step in advancing the social accountability mandate of medical schools for rural Canadians was to explore the role of educational levers to support rural physician recruitment and retention. In 2017, the CFPC and SRPC produced *The Rural Road Map (RRM) for Action* that laid out a strategy for multi-stakeholder collaboration.⁶ The framework consists of four primary directions with 20 specific sub-directions or actions for each, all with the overarching goal of improving the health of rural Canadians.

The RRM has influenced progress in raising awareness across Canada about the need for

improved access to rural health care. These include recommendations for the establishment of admissions criteria to enhance the recruitment of rural and Indigenous students, calling for rural training requirements for rural specialists, cultural safety training at all levels of medical education, defining training profiles for family medicine in the rural context and developing an evaluation framework with learners to get a better understanding of practice patterns and the distribution of family physician resources.^{6,11}

Our paper examines the current state of PGME in Canada and the implementation of the RRM actions 1–5, 7 and 8 in Canadian PGME [Table 1]. These actions focus on admissions policies, curriculum design using the CFPC Rural Priority Topics for Assessment,¹² Indigenous health and support for rural medical education infrastructure and leadership. The results from this study can help PGME reflect upon what yet needs to be done to optimise the education levers as part of an overall rural recruitment and retention strategy. Now more than ever medical schools must take up these actions as COVID-19 has exacerbated the inequitable distribution of rural healthcare services and magnified the stress and pressures on an already exhausted rural healthcare workforce.

METHODS

Study design

The programme directors of all 17 English- and French-speaking post-graduate family medicine programmes in Canada were invited to participate in an online survey from 7 October 2020 to 13 November 2020. The survey link was E-mailed to the programme directors along with a letter of information. The RRM Implementation Committee co-directors provided reminder communication with programme directors to improve response rates.

The questions in the current survey were developed around the specific educationally-based actions in the RRM. Actions 1–2 introduced the social accountability framework by mandating policies in the admissions process to increase rural and Indigenous representation in family medicine residency programmes.¹³ It is essential to understand how schools define rural and if they have selection criteria that reflect rurality or Indigenous backgrounds. This not only helps support a school's response to increasing diversity in their medical schools but also reflects research that recognises that learners who come from rural and remote communities have a higher tendency to choose family medicine and rural practice and hence is helpful for rural

Table 1: Actions 1 to 5 and 7 and 8 from the Rural Road Map for action^[6]

Direction 1: Reinforce the social accountability mandate of medical schools and residency programmes to address health care needs of rural and Indigenous communities

Action 1: Develop and include criteria that reflect affinity and suitability for rural practice in admission processes for medical school and family medicine residency programmes

Action 2: Establish and strengthen specific policies and programmes to enable successful recruitment of Indigenous and rural students to medical school and family medicine residency training, with established targets and measures of effectiveness

Action 3: Support extended competency-based generalist training in rural communities to prepare medical students and residents to be capable of and confident in providing broad-based generalist care in these settings

Action 4: Provide high-quality rural clinical and educational experiences to all medical students and family medicine residents that support experiential learning, enabling medical learners to feel comfortable with uncertainty and gain clinical courage

Action 5: Educate medical students and residents about the health and social issues facing Indigenous peoples, and ensure they attain competencies to provide culturally safe care

Direction 2: Implement policy interventions that align medical education with workforce planning

Action 7: Establish government and university partnerships with rural physicians, rural communities, and regional health authorities that include formal agreements to strengthen the delivery of medical education in rural communities by developing and implementing specific visible rural generalist education pathways led by rural academics and rural physicians. Provide substantial ongoing funding required to support rural faculty engagement, faculty development, research, administration and community engagement

Action 8: Establish programmes with targeted funding from federal, provincial, and territorial governments to enable rural family physicians and other specialists, predominantly those already in practice, to obtain additional or enhanced skills training to improve access to health care services in rural communities

physician recruitment.¹⁴ Questions 1–3 [Table 2] were developed to address these two actions. Actions 3–5 recommend the need for well-trained generalist physicians.¹⁵ It is known that there have been increases in the number of rural training sites, but what remains unaddressed is how effective these training sites are in providing adequate rural exposure and competencies to attract and retain future physicians. Recognising that rural practice requires specific skillsets, the CFPC developed rural-specific priority topics defined as foci for curriculum and assessment for trainees with residency programme expectations that trainees have exposure to and demonstrate competence in the competencies required to be ready to practice rural family medicine. Evaluating the programme's perception of whether the priority topics were taught and assessed is critical for success. Questions 4–7 were developed to assess actions illustrating the need for formal funding and support for rural faculty. Questions 8–12 were developed to explore rural physician representation in academic leadership positions and to explore rural-specific continuing professional development opportunities as both are known to influence rural recruitment and retention.¹⁶ Questions 12–14 and 17 focused on Action 8 considering the availability of enhanced skills and added competencies to support physicians in meeting the specific needs of rural communities even before the completion of training and while already in practice. Additional questions were included in the survey to help further investigate the rural medical education landscape in Canada. A mix of quantitative and qualitative questions were used, including Likert response scale questions, select all that apply, and open-ended questions. Because the study was envisioned as an evaluation of residency programme design, this study did not seek/require ethical approval as it falls under article 2.5 of Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.¹⁷

Quantitative analysis

All data analyses were performed in SPSS 24 (IBM Corp. Armonk, NY, USA). Descriptive statistics, including frequencies and percentages, were calculated for appropriate questions: For specifics refer to Table 2. A set of questions

based on the programme directors' opinions using a 5-point Likert scale gauging rural stream residents' versus all residents' readiness for practice was dichotomised as *prepared*, which included 'very well prepared, well prepared and adequately prepared' and *not prepared*, which included 'somewhat prepared and unprepared'. This decision was based *a priori* on the expert opinion of the RRM for Action Implementation Committee to ease interpretation and for potential statistical analysis. The results of these specific questions are in Table 2.

Qualitative analysis

Two members of the research team independently reviewed all qualitative responses. Responses were analysed and grouped together where appropriate, and the team identified themes across all surveys. If there was any disagreement between reviewers, the entire team was brought in.

RESULTS

In total, 13 (76%) programme directors agreed to participate in the study, 2 from French speaking schools and 11 from English speaking schools. The following results are broken up into three separate sections to correspond with specific actions from The RRM for Action and the questions designed to address those actions.

Section 1: Action 1 and Action 2 [Table 1]

At the post-graduate level, 5 responding family medicine programme directors stated that their programmes had specific definitions on what was considered rural. However, no consistent definition across post-graduate programmes in Canada could be found. Definitions of rural included towns <30,000 or a site at least 50 km away from the resident's home site. Only three programmes (23%) indicated that they have admission policies for equity and diversity; from those three, only one programme indicated that applicants' Indigenous background was considered in the admissions process. One programme shared that Indigenous interviewers were included in the admission interview process if an applicant disclosed their Indigenous heritage. Two programmes took

Table 2: Questions and results from the post-graduate medical education survey

Question	Results (%)
Q1. Do your admission policies address equity and diversity in your prospective resident cohort?	No=10 (77) Yes=3 (23)
1a. If so, do they reflect residents' Rural representation	No=1 (33) Yes=2 (67)
If yes, please describe them and share a resource link	Basic content analysis*
1b. If so, do they reflect residents' Indigenous backgrounds	No=2 (67) Yes=1 (33)
If yes, please describe them and share a resource link	Basic content analysis
2. Does your family medicine residency programme have an agreed-upon definition of or description for "rural" clinical teaching sites, tracks, and programmes?	No=8 (62) Yes=5 (38)
If yes, please describe it. Share a reference or link if applicable	Basic content analysis
3. Outside of the Canadian Resident Matching Service process, does your family medicine residency programme conduct an internal match for its residents to assign them to rural or remote primary clinical teaching sites?	No=12 (92) Yes=1 (8)
If yes, please list the names of these teaching sites, their locations, and the numbers of R1s and R2s per site	Basic content analysis
4. Across the 2 years residency programme, how many weeks, on average, do all residents have learning situated within rural or remote communities?	1 week=1 school; 8 weeks=6; 12 weeks=2; 20 weeks=1; 24 weeks=1; 70 weeks=1; 90 weeks=1
5. What are the total numbers of residents in your residency programme and the approximate number of residents (R1s and R2s) that spend the majority of their clinical learning time in rural or remote communities? Total number of residents	R1=1054; R2=1070
5. What are the total numbers of residents in your residency programme and the approximate number of residents (R1s and R2s) that spend the majority of their clinical learning time in rural or remote communities? Approximate number of residents learning in rural or remote communities	R1=274; R2=291
6. Does your family medicine residency programme use the CFPC's priority topics for rural and remote medicine?	No=4 (31); Yes=9 (69)
If yes, how does your family medicine residency programme use the CFPC's priority topics for rural and remote family medicine? Please describe	Basic content analysis
7. To what extent do you feel all residents are prepared for the following priority topics upon completing your overall residency programme?	Refer to Table 3
8. To what extent do you feel residents in your programme in a rural-specific stream are prepared for the following priority topics upon completing their residency?	Refer to Table 3
9. Does your family medicine residency programme offer extended learning opportunities (either a third year of training or a partial year) to help residents meet the needs of the rural communities in which they plan to work?	No=4 (31); yes=9 (69)
10. How is supplementary learning funded?	R3 funding=9; ministry=3; other=2; none=2
11. Does your department of family medicine offer formal mentorship opportunities to support physicians who are new to practising in rural communities?	No=12 (92) Yes=1 (8)
12. Does your department of family medicine or faculty of medicine's continuing professional development office offer learning opportunities to help practising physicians feel more prepared to work in rural or remote communities?	No=7 (54) Yes=6 (46)
If yes, please describe them and include how these opportunities are funded	Basic content analysis
13. Please describe any in-person faculty development offered locally in rural teaching settings	Basic content analysis
14. Please list the rural specific funded leadership positions in PGME	Basic content analysis
15. In addition to the above, please list funded leadership positions that are currently held by rural physicians	Basic content analysis
16. To what extent do major decision-making educational committees of your residency programme require rural educator representation in the terms of reference?	All=8; most=2; some=1; very few=1; none=1
17. Please describe the types of residency education committees that specially ask physicians in rural settings to participate	Basic content analysis
18. Please describe the ways in which rural communities have participated in your residency programme (e.g., providing housing, hosting visits with community leaders, offering invitations to events)	Basic content analysis

Contd...

Table 2: Contd...

Question	Results (%)
19. What challenges or barriers have affected your residency programme's ability to provide rural learning experiences for its residents?	Basic content analysis
20. Over the past 5 years, what has been a source of pride for your residency programme in advancing rural medical education?	Basic content analysis
21. Please share feedback on other ways you think the CFPC could help your residency programme advance the role of education as a way to prepare family medicine learners to practise in rural and remote communities	Basic content analysis

**Basic content analysis=Open-ended answers. CFPC: College of Family Physicians of Canada, PGME: Post-graduate medical education

rural backgrounds into consideration, but no specific details were provided on what or how the admission policies were shifted based on a student's rural background.

Section 2: Actions 3, 4, and 5 [Table 1]

At the post-graduate level, 9 programmes use the CFPC priority topics for rural and remote medicine in the curriculum and programmatic assessment design of their residency programmes. In all instances, post-graduate directors ranked their rural-specific stream residents to be equally or more likely to be adequately prepared than all residents across the CFPC's rural priority topics [Table 3]. For example, when comparing all residents versus residents in a programme's rural-specific residency stream, only 11 (85%) programme directors responded that all of their family medicine residents were adequately prepared for managing trauma, whereas all 13 (100%) programme directors ranked their rural-specific stream of residents as being prepared. Eighty-five per cent of programme directors reported that they felt all residents in their programme were adequately prepared in cultural safety, but only 62% felt they were competent to address Indigenous health issues [Table 3].

Among the 13 participating post-graduate directors, the median percentage of residents in Family Medicine programmes (1st and 2nd year combined) who spent most of their clinical learning time in rural or remote communities was 32% (custom analysis). Some respondents suggested that lack of preceptors and lack of funding were the largest barriers affecting a residency programme's ability to provide the desired level of immersive rural learning experiences for residents.

Section 3: Actions 7 and 8 [Table 1]

Respondents indicated that there are funded rural-specific leadership positions, suggesting that resources are being allocated by medical schools to support the delivery of education in rural contexts. Specifically, programme directors indicated that they do have budget to fund rural specific leadership positions for their faculty. In addition, 10 programme directors indicated that most or all of their decision-making educational committees required rural physician representation. Nine programme directors responded that R3-designated funding was available from a provincial or ministry of health and 3 programme directors responded that special funding from the Ministry of Health, specific for preparation to practise in rural/remote locations, was accessible.

Only 6 programme directors stated that they offer learning opportunities to help practising physicians feel more prepared to work in rural or remote communities. For example, some programmes offer rural retreats, faculty development sessions, funding to support rural teaching and professional development sessions. However, few programme directors responded that they were able to elaborate on the funding behind these programmes.

DISCUSSION

The aim of this paper was to use the RRM for Action as a framework to examine the current state of rural PGME in Canada by surveying programme directors. Research has shown that factors related to PGME can significantly impact practice location and the health of rural communities and can demonstrate a faculty's progress on their social accountability journey.¹⁸ The results of this study suggest that there is still work to do.

Table 3: Perceptions of family medicine programme directors of preparedness for rural-priority topics of residents in the rural-specific stream versus all residents

Prepared for rural priority topic	Number of programme directors perception of their residents (all), <i>n</i> (%)	Number of programme directors' perception of their rural stream specific residents only, <i>n</i> (%)
Trauma	11 (85)	13 (100)
Patient transfer	10 (77)	11 (85)
Septicaemia	13 (100)	13 (100)
Paediatric emergencies	11 (85)	11 (85)
Acute cardiac presentations	13 (100)	13 (100)
Psychiatric emergencies	12 (92)	13 (100)
Diabetic emergencies	12 (92)	12 (92)
Active airway management	9 (69)	13 (100)
Urgent respiratory presentation	13 (100)	13 (100)
Fracture and dislocation management	10 (77)	13 (100)
Intrapartum care	13 (100)	13 (100)
Altered level of consciousness	13 (100)	13 (100)
Procedural sedation	7 (54)	12 (92)
Chronic pain	13 (100)	13 (100)
Indigenous health	8 (62)	11 (85)
Clinical courage	11 (85)	13 (100)
Adapting to rural life	9 (69)	13 (100)
Cultural safety and sensitivity	11 (85)	12 (92)

A recurring issue across most rural research is the lack of a consistent definition of rural.¹⁹⁻²¹ In the absence of an agreed upon designation, it will be difficult to determine if medical schools, programmes, or health education policies have made objective strides in increasing the number of Canadian rural physicians. For instance, one school had a definition that included towns <30,000, while another used a definition of a site at least 50 km away from the resident's home site. These definitions would capture two very different rural populations. Rural physicians, researchers, and health care administrators must begin to formalize discussions for a standard designation of rural to be used across Canadian residency programmes. Without it, evaluations will be limited with lack of comparable data to inform educational policy reform.

Unlike some Canadian undergraduate medical education programmes, which have designated student seats for rural and Indigenous students, this study shows that there is no evidence that similar structures exist in PGME. When schools did have equity and diversity policies at the post-graduate level, they typically consisted of score adjustments or the inclusion of Indigenous members on the interview committee, rather than the direct seat allocation used in the undergraduate system. Increased resources are needed to help

ensure that once a student interested in rural medicine enters their medical education, they are adequately supported throughout their education and career as a rural physician. To achieve the desired diversity in the physician workforce and work towards Actions 1 and 2 in the RRM, faculties must support a representative mix of medical students, including ethnicity and geographic origin beyond undergraduate medical education and into post-graduate training.

Previous research has indicated that the location of medical training and the length of medical training is associated with the location of practice upon graduation.²² Since the results of this study suggest that almost one-third of all residents spend most of their clinical training time in rural or remote communities, one would expect to see a greater proportion of physicians practising in rural areas. Future research is needed that focuses on action 3 and 4 to understand ways to mitigate or help students and residents adapt to the uniqueness of rural practice and improve upon the 8% of family doctors practising in rural and remote regions.²³

The prevalence of arthritis, asthmas, diabetes, obesity and tuberculosis are all higher in the Indigenous populations in Canada than in non-Indigenous populations.²⁴ This study found that only 62% of residents were rated as

adequately prepared to care for Indigenous health issues meaning there is much work to be done on action 5. Multiple complex factors drive the health of Indigenous people, and specialised training for physicians is needed to provide better care for them. Medical institutions have a significant role to play in decreasing the health inequities between Indigenous and non-Indigenous populations, especially in rural locations and the results suggest that this is a much needed area of improvement. In keeping with the calls to action from the Truth and Reconciliation Committee, specifically Actions 18–24, healthcare educational institutions are called on to provide cultural training and skills-based training as part of a national strategy to identify and close the gaps in health outcomes for Indigenous people.²⁵

In a study published in 2003, rural physicians ranked advanced skills training as one of the top six medical education training solutions to recruit and retain rural physicians.²⁶ This finding was supported by another more recent study that suggested one of the most significant issues for rural physicians is the challenge in participating in continuing medical education for their skills training.²⁷ The combination of these studies highlights the importance of having accessible rural-specific enhanced skills training, but this study found that only 46% of schools offer learning opportunities to help practising physicians feel more prepared to work in rural or remote communities. In correspondence with action 7, to help support rural physicians, publicly funded collaborative networks between schools and communities need to be formed so that more learning opportunities are available for rural physicians.

The results from this study can help PGME reflect upon what yet needs to be done to optimise the education levers as part of an overall rural recruitment and retention strategy. Now more than ever medical schools must take up these actions as COVID-19 has exacerbated the inequitable distribution of rural health care services, and magnified the stress and pressures on an already exhausted rural healthcare workforce.

Limitations

One key limitation of this study is the survey relies on the knowledge of one person in the programme. It is possible that there are components or nuances

of the residency programme that the survey taker might not have been aware of. Future research in this area might use targeted surveys to get a broader picture of the entire programme.

Despite efforts over the last decades to identify and respond to the needs of Canada's rural physician workforce, there is still work to be accomplished on a national scale. The RRM was conceived to harness government, academia, communities and rural physicians in concert to develop a national strategy for rural physician workforce planning. There is evidence that these collective efforts have had results, most notably in specific programmes and schools (Northern Ontario School of Medicine University, rural dedicated pathways and programmes in UME and PGME) dedicated to providing competent rural physicians. However, the reality is that making efforts in this area needs to be at the national level with the understanding that this work is about marathons, not sprints. With universal healthcare being a defining national value, it is essential that healthcare programmes are frequently assessed to ensure that healthcare remains accessible to all Canadians, including those in the rural and remote locations.²⁸

CONCLUSION

With the continual push towards social accountability and equity, diversity and inclusion, the results from our study have laid the foundation for understanding the current state of PGME in Canada and identified opportunities to move forward. Our study identified a lack of policies to help rural and Indigenous students enter desired placements, residents must receive more training in Indigenous health issues, and more rural specific skills training is needed. In agreeance with other research, educational initiatives, human workforce planning for rural healthcare and support for rural practice networks are warranted.²⁹

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The occasional abdominal paracentesis

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INTRODUCTION

Once in a while, there is fluid in the abdomen. Usually, it is ascites from cirrhosis, heart failure or malignancy; it could even be infected. Which is it? (Imaging won't tell you.) A tap could make the diagnosis clear.¹ Can you make your patient more comfortable by draining most of it? Of course you can.²

EQUIPMENT

- Portable Ultrasound with abdominal probe and gel
- Surgical skin prep such as Provioline
- 5cc syringe and needles for anaesthetising the tract
- Xylocaine 1%
- Sterile drapes and gown
- #14-gauge IV cannula
- Three-way stop cock
- Sample tubes (typically for cells chemistry and cytology)
- Suction tubing and body of 10cc syringe as an adapter
- Wall suction with drainage carousel or evacuated vacuum containers

PROCEDURE

I was trained to do the procedure without imaging.

1. Position the patient on their side.

I go lateral to the rectus on the dependent side to avoid injury to the hypogastric artery. Avoid any scarred areas that might have adherent bowel

2. Mark the level of shifting dullness and go dependent to there. These days, I use an ultrasound, as a quick application of the probe will find a deep pocket of ascites for you clear of any vulnerable structure [Figure 1]. I'm old school, so after finding my spot, I mark it on the patient in pen. When doing the procedure, I can watch my hands and the patient, and not the screen. Some practitioners are agile enough to do the job two-handed, when watching the screen, with a sterile ultrasound probe cover (e.g., a sterile glove palm) in one hand and the needle in the other. Use the technique that you are comfortable with
3. Prep a generous area around the mark and drape the patient with sterile drapes
4. Using a small needle raise a skin bleb with 0.5 ml xylocaine [Figure 2]
5. Attach the syringe containing residual 5–10 ml xylocaine to a three-way stop cock and the back end of a 14-gauge intravenous (IV) cannula, infiltrating as you go [Figure 3]

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6. Advance the needle slowly into the abdominal cavity alternately injecting local anaesthetic and applying slight suction. I place my finger along the needle to control the insertion [Figure 4]
7. When ascites fluid is aspirated, withdraw the steel needle and syringe from the cannula and replace the stopcock and syringe to draw samples (if desired). The arm of the stopcock always points to the port that is turned off. Note the colour and turbidity of the liquid. If turbid, infection or malignancy may be suspect. If diagnosis is the aim, samples can be drawn for cell count (purple top tube), protein and other chemistries (red top tube), cytology (formalin) and microbiology (usually a sterile urine container)
8. Attach the suction tubing to the unused port on the stopcock. Standard wall suction tubing

can be attached to a Luer lock connector with the body of a 10cc syringe [Figure 5]

9. Attach to wall suction and set on regulated low-to-medium suction [Figure 6]. The catheter can be easily displaced when waiting for the fluid to drain. Be careful not to withdraw all the fluids as this might drop the blood pressure.

COMPLICATIONS

Over a few decades of rural medical practice, I have encountered common complications of blocked needle, kinked needle, needle that gets pulled out and similar incidents that require replacement of the catheter. Occasionally, I have had a persistent fluid leak that may require a purse string closure and pressure dressing. I have never had a patient go hypotensive or bleed, but



Figure 1: Ultrasound showing large pocket of fluid in black under the probe

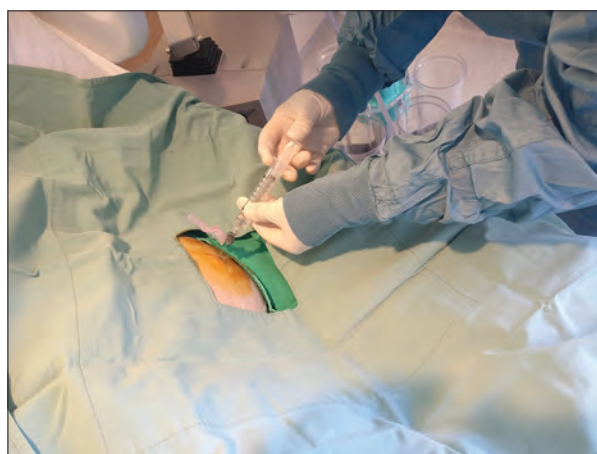


Figure 2: Freezing the skin



Figure 3: The cannula stopcock syringe assembly



Figure 4: Tapping

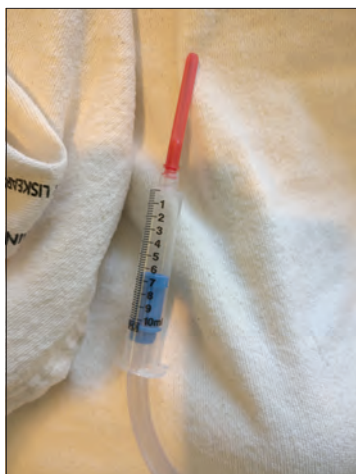


Figure 5: Capped adapter



Figure 6: Suction collection

if that occurs, I would treat with IV saline and potentially albumin. Bleeding from the abdominal wall can be controlled with a figure-of-eight suture. Intra-abdominal bleeding would require laparotomy.

CONCLUSION

Abdominocentesis can be easily done by the rural generalist physician to provide relief or diagnosis for your patient.

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