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Rural physician supply and retention: factors in the Canadian context

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Introduction: Millions of Canadians are without a primary care provider, with rural areas being most affected. The primary objective of this article was to explore the factors surrounding the retention of rural physicians in Canada.
Methods: We conducted a critical literature review on rural physician retention. We searched PubMed, Embase, CINAHL and ERIC for relevant articles and completed a narrative synthesis.
Results: National challenges in physician supply have taken a disproportionate toll on Canadians living in rural regions and provinces. Nearly 75% of patients lack access to a regular physician in some areas. Current challenges in rural physician supply include prior reduced enrolment at Canadian schools, increased competition for international medical graduates in urban centres, longer postgraduate training times and migration from rural to more urban areas. Several evidence-based strategies exist to improve retention, such as early exposure to rural medicine during training and recruitment incentives. Cohort studies suggest that increasing enrolment for local medical students results in increased provincial physician supply.
Conclusion: Nationally there is both a shortage and maldistribution of the physician supply, with rural Canadians being disproportionately affected. Enhanced, forward-thinking retention strategies, including early rural exposure for trainees and training local students, will improve community health and help correct rural disparities for Canadians.

Introduction : Des millions de Canadiens n'ont pas de fournisseur de soins primaires, en particulier dans les régions rurales. Le but principal de cet article était d'examiner les facteurs de maintien en poste des médecins en milieu rural au Canada.
Méthodes : Nous avons effectué une recension critique de la littérature sur le maintien en poste des médecins en milieu rural. Nous avons interrogé les bases de données PubMed, Embase, CINAHL et ERIC afin de trouver des articles pertinents, et nous avons fait une synthèse narrative.
Résultats : Les défis liés à l'offre de médecins au Canada ont eu un effet négatif disproportionné sur les habitants des provinces et régions rurales. Près de 75 % des patients n'ont pas accès à un médecin attitré dans certaines régions. En milieu rural, les défis comprennent la réduction antérieure du taux d'inscription dans les facultés de médecine canadiennes; la concurrence accrue pour les diplômés internationaux en médecine dans les centres urbains; la durée accrue de la formation postdoctorale et la migration vers des régions urbaines. Il existe plusieurs stratégies fondées sur des données probantes visant à améliorer le maintien en poste, notamment l'exposition précoce à la médecine rurale dans le cadre de mesures incitatives de formation et de recrutement. Des études de cohorte donnent à penser que la hausse du nombre d'inscriptions d'étudiants en médecine locaux entraîne une augmentation de l'offre provinciale de médecins.
Conclusion : À l'échelle nationale, il existe à la fois une pénurie et une mauvaise distribution de l'offre de médecins qui touchent de façon disproportionnée les régions rurales. Des stratégies de maintien en poste améliorées et avant-gardistes, notamment la formation des étudiants locaux et une exposition précoce à la formation rurale pour les médecins en formation, favoriseront la santé communautaire et aideront à corriger les disparités.

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INTRODUCTION

At present, there is a critical shortage of physicians in Canada: more than 4.6 million Canadians are without a primary care physician.[1] Across the country, physician supply is in a constant state of flux, with rural areas experiencing the largest deficits and urban regions experiencing surpluses in certain disciplines.[2–5] The primary objective of this critical literature review was to examine the factors surrounding the retention of rural physicians in Canada. By examining these factors, improved programs and policies may be developed, thereby promoting efficiency within health care services, reducing regional inequalities and improving the health status of Canadians.

METHODS

We searched PubMed, Embase, CINAHL and ERIC for peer-reviewed articles from 1995 to 2016. Search terms included physician(s), retention, rural practice, rural health, physician supply and regular doctor. Search terms were limited to the title or abstract. We also searched Google and Google Scholar for relevant reports on physician retention, physician supply and rural health inequalities.

RESULTS

Physician shortages

The figure of 4.6 million Canadians needing a regular doctor[1] is somewhat misleading, as it does not break down Canadians by whether or not they have looked for a physician. Based on Canadian Community Health Survey data, about 1.2 million people cannot find a physician, and 2.4 million are not actively looking for one.[1] Likewise, with only 228 physicians per 100 000 people, Canada has one of the lowest physician-to-population ratios among countries that provide universal health care.[2,6]

Although many Canadians are unable to find a family physician, this does not necessarily imply there is an absolute shortage, as the underlying geographic maldistribution of physicians has a substantial negative impact.[3,4] More than 20% of the Canadian population reside in rural areas, but only 9.3% of physicians practise there.[3] This is not due to a decreased need for medical services: more rural than urban residents lack a regular physician.[3] There is also significant interprovincial migration of physicians, which has resulted in net losses for rural provinces such as Saskatchewan and Manitoba.[2] This ultimately results in an increase in the urban/rural disparity in health care services. Although intraprovincial data are lacking, one can extrapolate that there is likely net migration within provinces, from rural to urban regions.

Historically, this shortfall has been largely mitigated through recruitment campaigns aimed at international medical graduates.[7] However, the practice of recruiting from outside Canada can lead to "poaching" of doctors from emerging nations.[8] There are an estimated 1700 physicians from South Africa and 1400 from India practising in Canada.[9] With the HIV epidemic spreading across Africa, such jurisdictions cannot afford to lose any of their physicians.[4] As a developed nation, it can be argued that Canada has a responsibility to ensure self-sufficiency in its physician supply, through targeted enrolment and improved retention in rural regions. Developing countries are now facing shortfalls in their health human resources, and this, coupled with changing immigration policies, has led to a decrease in the proportion of international medical graduates in the Canadian physician workforce, from 30% in the 1980s to 25.4% in 2015.[4,10] This re-emphasizes the importance for Canada to become self-reliant in its physician needs.

It is also important to consider that the overall number of primary care physicians in Canada has increased over the last 2 decades. In 1980, there were 76.4 family physicians per 100 000 people; this increased to about 115 family physicians by 2015.[2,4] For an era in which we perceive a physician shortage, this ratio does not seem congruent. Intergenerational differences in practice patterns and rising patient complexity also play a role. Although total numbers have increased since the 1980s, there is some suggestion that younger physicians are working fewer hours than older ones. National Physician Survey data showed that physicians aged 35–54 tended to work fewer hours than age-matched peers a decade prior.[11] It is also reported that female physicians may work fewer hours than male physicians, although most studies examining women's work hours have not adjusted for age and other confounders, and any effect is likely small.[12] As well, Kirby[10] pointed out that most studies examine only the total numbers of physicians and fail to account for productivity issues, such as inadequate operating room time for surgeons. It does appear that a component of the physician supply problem may actually be related to the change in productivity and is not simply a deficit in the total numbers.[10]

Some of the current difficulties in physician supply can be traced back to the 1991 Barer–Stoddart report, which raised a red flag on potential physician surpluses.[13] It recommended enrolment reductions across the country to reduce overproduction of physicians. Between 1991 and 2000, medical schools saw an overall 13.4% cut in the number of seats,[14] and the number of international medical graduates entering Canada was restricted. However, the report was flawed in several capacities. It examined only yearly averages, precluding a sophisticated analysis of the trends, and oversimplified the problem. It failed to account for several factors affecting the overall supply, namely, the aging workforce and decreased international medical graduate recruitment.[10,14] As well, longer postgraduate training has resulted in a decrease in the number of fully licensed physicians. In the 1990s, the minimum time to practise was increased from a 1-year internship to a 2-year residency in family medicine.[10] Furthermore, many family physicians are now completing additional "enhanced skills" programs to better serve increasingly complex patient populations. Similarly, there has been an increase in the number of medical students pursuing specialist training, and many specialist physicians now commonly complete a 1- or 2-year postresidency fellowship, further increasing time to practice.

Rural challenges and physician retention

The problems in physician supply have taken a disproportionate toll on Canadians living in rural regions and rural provinces. Rural Canadians already experience lower life expectancy, higher infant mortality, higher cancer mortality, higher cardiovascular disease mortality, higher accident rates and higher levels of disability.[4] From 1995 to 2001, the proportion of rural residents dissatisfied with the health care system increased from 9.5% to 25.6%.[3] In addition to these health problems, many lack appropriate physician care. In Newfoundland and Labrador, 75% of residents who lacked a regular doctor lived in rural areas.[3] To complicate matters, it is unlikely that an overall increase in physician supply will translate into increases in these communities.[4]

To quantify some of the hardships rural areas face, Ng and colleagues[5] conducted an analysis of the geographic difficulties with physician distribution. They used enumeration areas from census data to compare the average distance between residents and physicians among rural and urban areas. They found that there was fewer than 1 physician per 1000 people in rural areas, whereas there were more than 2 per 1000 people in urban areas. The mean travel distance to a physician was 10 km for rural residents, compared to 2 km for urban residents. Travel in rural and remote areas is a major barrier to receiving regular and more specialized medical care, especially with poor transportation infrastructure and high fuel costs. In this context, geography can be considered a determinant of health.[4]

Increasing the supply of rural physicians in a sustainable manner will likely require more complex measures, in addition to financial incentives. Sempowski[15] conducted a systematic review to examine the effectiveness of return-of-service agreements (financial incentives provided to undergraduate or postgraduate medical trainees intended to enhance rural recruitment). The review identified 8 studies, and, although the available data were weak, incentives appeared to increase short-term physician supply. However, it has been suggested that these programs tend to have poor results for long-term retention of rural physicians.[4,15] A more recent study in Newfoundland and Labrador showed that doctors under a return-of-service agreement were less likely to leave the province than were those who had not signed such an agreement (odds ratio [OR] 3.22 [95% confidence interval (CI) 1.41–7.14]).[16] As well, 90% of physicians with a return-of-service agreement remained in practice at 4 years, which indicates a possible role for such agreements in encouraging longer retention.[16] However, unlike many return-for-service agreements, those in Newfoundland and Labrador permitted practice anywhere within the province, not in a prespecified area.

One factor to consider in physician retention is geographic background. In a cross-sectional survey, Chan and colleagues[17] examined factors influencing Canadian rural family physicians' decision to enter rural practice. One-third of the 382 respondents grew up in a rural community (< 10 000 people). During medical school, the proportion interested in rural medicine increased from 28% in year 1 to 77% by the end of postgraduate training. The challenge of rural life was rated as an important factor in choosing a rural career. During medical training, physicians with an urban background rated exposure to rural practice as being important in final practice location. It is clear that interest in rural medicine is higher among those with a rural background. However, this study shows that physicians with an urban background make up two-thirds of the rural workforce and that exposure to rural rotations during medical training also substantially

influences those with an urban background to enter practice in rural areas.

Rourke and colleagues[18] also conducted a cross-sectional study assessing the relation between rural background, practice location and rural medical education. They found that rural physicians were more likely than urban physicians to have a rural background (OR 3.31 [95% CI 1.87–5.86]), to have received rural clinical training during undergraduate medical education (OR 2.46 [95% CI 1.53–3.96]) and to have received rural training during postgraduate education (OR 2.17 [95% CI 1.28–3.69]).

In a study comparing Ontario medical school applicants from rural and urban backgrounds in 2002 and 2003, Hutten-Czapski and colleagues[19] found that the 2 groups had similar grade point averages and Medical College Admission Test scores and were about equally as likely to be accepted. However, although the population of Ontario is 13% rural, only 7.3% of the applicants were of rural origin. Those authors hypothesized that this could be due to a number of factors, such as financial barriers and lack of role models. As Chan and colleagues[17] showed, rural background is associated with future rural practice; thus, increasing the number of rural students in medical schools should be a consideration.

Another study on the characteristics of medical school students gave similar results. Dhalla and colleagues[20] surveyed first-year undergraduate medical students across Canada (excluding Quebec) and found that only 10.8% were from rural Canada, compared to the 22.4% of the population who reside in rural communities ($p < 0.001$). With its high response rate (80.2%), this study adds to the evidence that rural students are underrepresented in medical schools. Reducing rural inequalities in access to health care may involve increasing admission of rural students into medical school. Although this was a national survey, it is limited by the exclusion of Quebec, owing to technical problems with email databases.

Rourke and colleagues[21] surveyed rural family physicians and family medicine residents to determine how they rated possible retention strategies for rural practice. A total of 276 physicians and 210 residents responded (response rate 46.6%). Family physicians rated not having to be on-call more than 1 night in 5 and having a supply of locums as being important. Rural physicians ranked funding for continuing medical education and paid time off for participating in these sessions as being important to ensuring adequate rural medical education. Residents rated enhanced locum payment plans, such as travel assistance, as being most important for recruitment. They rated a payment plan to allow time off to teach continuing medical education as being an important recruitment strategy. As with many survey studies, the response rate was somewhat low, which may have resulted in responder bias.

Many of the studies on rural recruitment and retention tend to focus on the physician's perspective. However, spousal factors play an important role in physicians' decision to practise in rural settings. In a qualitative study on spousal perspectives on recruitment and retention of rural doctors, Mayo and Mathews[22] contacted 23 rural physicians in the Burin Peninsula region in Newfoundland and Labrador; 13 spouses agreed to be interviewed. Eight were unemployed, 4 by choice and 4 because of a lack of opportunities. Five participants were spouses of physicians born and trained in the province, and 8 were spouses of international medical graduates. The respondents identified 2 major factors as having an impact on retention: physician workload and community integration. As those authors pointed out, limiting on-call time would help to alleviate the former problem. In a similar qualitative study, Wasko and colleagues[23] interviewed 62 rural physicians in Saskatchewan. Using grounded theory and inductive analysis, they generated multiple themes important for retention, including broad scope of practice, spousal enjoyment of the community and personal enjoyment of the community. In terms of recruitment, the most frequent themes were scope of practice, attraction to the rural lifestyle and having a rural background.

Sociodemographic factors affecting retention

Given the shortages and maldistribution of physicians, there is a need to identify factors that would improve retention. With significant interprovincial and international migration, there is a need for rural regions to hold onto their practising physicians. For example, in Newfoundland and Labrador, net losses from 2010 to 2014 ranged between 12 and 44 physicians per year.[2] Effective retention strategies will not only prevent losses but will also contribute to improving efficiency and sustainability within the health care system. Retention in rural and underserviced centres will help reduce overall costs related to the need to constantly recruit and orient new physicians, an expensive endeavour.[24] In addition, improved retention will contribute to

the length of doctor–patient relationships and improve patient satisfaction.[25]

Mathews and colleagues[26] conducted a cross-sectional study examining the retention of Memorial University medical graduates, both provincially and nationally. They linked 2014 data on 1864 medical graduates from the Faculty of Medicine class lists, alumni database and Scott's Medical Database to identify predictors of retention. They found that 88.1% of graduates were practising in Canada, 34.2% were practising in Newfoundland and Labrador, and 11.6% were practising in rural Canada. Using multiple logistic regression, those authors determined that rural background (OR 2.33 [95% CI 1.73–3.13]) and being a family physician (OR 3.61 [95% CI 2.62–4.96]) predicted rural practice in Canada. Predictors of working in rural Newfoundland and Labrador included rural background (OR 3.35 [95% CI 2.13–5.27]), being from Newfoundland and Labrador (OR 11.11 [95% CI 2.70–45.75]), postgraduate training in Newfoundland and Labrador (OR 3.55 [95% CI 1.89–6.66]) and being a family physician (OR 3.68 [95% CI 2.23–6.08]). Therefore, a potential strategy to increase the provincial physician supply may be to increase enrolment for local medical students. Memorial University recently implemented an expansion of its medical school with hopes of improving retention of local graduates.[27] As well, rural Newfoundlanders who graduated from Memorial's medical school were even more likely to practise in Newfoundland. Thus, policies to increase admissions for rural students may help alleviate rural shortages. This study, however, is limited by its cross-sectional design, which precludes information about practice locations before 2014 and length of practice. It is possible that Memorial graduates practised outside of Newfoundland and Labrador then returned home, but it is more likely that they spent much of their career within the province.

Although it is important to know the characteristics of local graduates who stay in a province, it is unclear what the differences are between locals, other Canadians and international medical graduates. In a retrospective study comparing the mean length of stay of these 3 groups, Mathews and colleagues[7] linked data from the College of Physicians and Surgeons of Newfoundland and Labrador, 2004 Scott's Medical Database and the Memorial University postgraduate database. They followed family physicians and general practitioners who started practising between 1997 and 2000 and tracked them until 2004. They found that, compared to local graduates, other Canadian graduates and international medical graduates were more likely to leave Newfoundland and Labrador (hazard ratio 2.15 [95% CI 1.29–3.60] and 2.03 [95% CI 1.26–3.27], respectively). As well, being a Certificant of the College of Family Physicians of Canada was associated with an increased likelihood of staying in the province (OR 1.47 [95% CI 1.04–2.13]). Local graduates stayed much longer than other Canadians and international medical graduates, with half staying 39 months, compared to 25 and 22 months for other Canadian graduates and international medical graduates, respectively. Mou and Rose-Olfert[28] reported similar findings among 3995 family physicians in a cross-sectional study using data from the 2010 National Physician Survey. They found that international medical graduates in rural areas were more likely to migrate than other Canadian graduates (OR 3.08 [95% CI 1.54–6.14]). This supports previous findings that Canadian and local graduates tend to remain in rural regions longer.

In a retrospective study, Fleming and Mathews[29] examined the retention of specialist physicians in Newfoundland and Labrador (180 physicians from 2000–2004 cohort and 211 physicians from 1993–1997 cohort). Physicians in the 2000–2004 cohort were less likely to leave than those in the 1993–1997 cohort (OR 1.6 [95% CI 1.23–2.08]). In the 2000–2004 cohort, medical graduates of Canadian universities, provisionally licensed international medical graduates and fully licensed international medical graduates were 3.19 (95% CI 1.47–6.89), 1.85 (95% CI 1.09–3.17) and 4.39 (95% CI 1.91–10.10) times more likely, respectively, to leave Newfoundland and Labrador than local medical graduates. Those authors also noted that provisionally licensed international medical graduates constituted about 30% of the local physician workforce, compared to a national rate of about 5%, which suggests a high reliance on international recruitment for local supply. Other rural provinces, such as Saskatchewan and Prince Edward Island, use high proportions of noncertified specialists. In contrast, less than 1% of Ontario's specialist workforce is noncertified.[30] Current data suggest that provisionally licensed international medical graduates often do not remain for long periods, with many leaving for urbanized centres within several years of starting practice.[8] This further reinforces the importance of training medical students locally.[8]

DISCUSSION

It is apparent that, within Canada, there is both a shortage and maldistribution of the physician supply. This is most apparent within the rural setting, where there is a major disparity in access to the health care system. Owing to these tremendous socioeconomic inequities, rural communities face even greater difficulties than the rest of Canada. Many residents do not have basic medical care and face enormous geographic challenges in accessing it. Increasing the number of rural students in local schools will help combat shortages, and early exposure to the rural environment will attract students from urban backgrounds. Overall strategies to improve retention will ensure a stable physician supply and, therefore, will have benefits for population health over the long term. Locally trained physicians practise longer in their home province than out-of-province graduates and international medical graduates. It is important to ensure that there are rural educational opportunities for learners in undergraduate and postgraduate medical training.[31] Ultimately, enhanced, forward-thinking retention strategies will improve community health and help correct rural disparities for Canadians.

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