Canadian Journal of Rural Medicine | Journal canadien de la médecine rurale

Spring 2002 Table of Contents • Printemps 2002 Table des matières

Who makes Canada's rural doctors?

Peter Hutten-Czapski, BSc, MD, CCFP
A. Dianne Thurber, BSc, MA

CJRM 2002;7(2):95-100

Objective: To investigate the relationship between the location of medical training (graduate and undergraduate) and the proportion of graduates practising in a rural location 2 years after graduation.

Design: Post-MD Educational Registry databases matched against the Canadian Medical Association databases.

Results: 3088 of 3662 physicians graduating from Canadian family practice training programs and 4380 physicians graduating from specialty programs between 1994 and 1998 were matched against practice location 2 years later. Overall, 20.9% of family practice trained physicians and 4.4% of specialty trained physicians practised in rural areas (population < 10 000). Significant associations with rural practice included the Memorial University of Newfoundland family practice residency program (46%) and the Université Laval family practice program (41.7%). The Laval program produced 18% of Canadian-trained rural family physicians in the study period. Significant negative associations with rural practice included the University of Toronto family practice program (4.6%) and family medicine emergency medicine (EM) programs (6.5%). Among family physicians, gender was not significantly associated with any practice locale.

Conclusions: The effect that the Canadian medical educational system has on eventual practice location is unlikely to be neutral. The proportion of rural practice location of Canadian graduates 2 years after completing training varies 10-fold between institutions and programs.

Objectif : Étudier le lien entre le lieu de la formation médicale (supérieure et prédoctorale) et le pourcentage des diplômés exerçant en milieu rural deux ans après avoir obtenu leur diplôme.

Conception : Analyse rétrospective de cohortes tirées des bases de données du Système informatisé sur les stagiaires post-MD en formation clinique et de celles de l'Association médicale canadienne.

Résultats : Pour 3088 des 3662 médecins ayant obtenu leur diplôme de programmes canadiens de formation en médecine familiale et 4380 médecins ayant obtenu leur diplôme de programmes de spécialisation entre 1994 et 1998, on a relevé le lieu d'exercice deux ans plus tard. Dans l'ensemble, 20,9 % des médecins ayant reçu une formation en médecine familiale et 4,4 % des médecins diplômés des programmes de spécialisation exerçaient en milieu rural (population < 10 000). Parmi les éléments associés à la pratique en milieu rural, on a noté un lien positif marqué avec le programme de résidence en médecine familiale de l'Université Memorial de Terre-Neuve (46 %) et avec le programme de médecine familiale de l'Université Laval (41,7 %). Au cours de la période d'étude, le programme de Laval a produit 18 % des médecins de famille ruraux formés au Canada. Les liens négatifs importants avec la pratique en milieu rural comprenaient le programme de médecine familiale de l'Université de Toronto (4,6 %) et les programmes de médecine d'urgence de la formation en médecine familiale (6,5 %). Chez les médecins de famille, on n'a constaté aucun lien significatif entre le sexe et le lieu de pratique.

Conclusions : Il est peu probable que l'effet du système canadien de formation en médecine sur le lieu éventuel de pratique soit neutre. Entre les divers établissements et programmes, le pourcentage de diplômés canadiens exerçant en milieu rural deux ans après avoir terminé leur formation varie d'un facteur 10.

Contents

• Abstract • Introduction • Methods • Results • Discussion • Conclusion • References

Introduction

Unlike countries such as Australia, Canada has not made nationwide physician human resources planning an ongoing priority. It is only now, in the face of increasing shortages, that serious consideration is being given to educational expansion and reform. It is sobering that the fruits of such reform are not expected for a decade.

The Canadian Medical Association (CMA) has reported that, even at the existing, although arguably inadequate, urban family doctor-to-population ratio, rural Canada is short 1652 family physicians.1 With annual attrition of family doctors in rural areas in BC2 and Quebec3 standing at between 10% and 20% this rural deficit is growing quickly. Urban attrition is slower,2 but there too the number of doctors retiring will soon begin to exceed the number of new graduates.4

At present there are many competing options to increase care capacity in this country. Some call for another rural medical school, such as the proposed Northern Ontario Rural Medical School,5

but simultaneously acknowledge that most of its graduates would likely choose to practise in an urban area. Others call for the expansion and reform of existing schools as a more efficient way to affect the overall proportion of physicians who choose a rural practice over an urban practice.6 Some advocate for continuing Canada's reliance on foreign medical schools and (re)opening the doors to international medical graduates (IMGs), because the other options take too long. Finally, others argue for using alternative health providers, such as nurse practitioners, to make up the deficit.

It is often argued that universities should be responsive to societal needs. University officials counter that they cannot fully discharge this mandate with inadequate resources. However, the governments that fund the system are understandably cautious about simply increasing the funds given to medical schools. They require assurances that specific goals will be met. To date these have been difficult to guarantee.

To make sensible decisions on how to restructure the system to meet the ongoing and future needs of the population we need a better understanding of the existing training system. With the greatest challenge being how to service the most underserviced we must be able to answer the fundamental question: Who makes Canada's rural doctors?

There are no Canada-wide data available. US data show that the propensity of medical schools to produce rural physicians varies dramatically among training institutions, with 12 medical schools accounting for over one-quarter of US physicians entering rural practice.7

Canadian data have been program specific and varied in definition. In a small rural program at the University of British Columbia, 51% of its graduates practise in rural areas.8 Queen's University, Kingston, Ont., surveyed its family practice program graduates from the years 1977 to 1981 and found that 28.3% had a first practice in a rural community.9 Pong and colleagues showed that the 14.3% of graduates of the Northeastern Ontario Family Medicine (NOFM) program in Sudbury, Ont., subsequently practised in rural environments.10 We hypothesize that the location of training in undergraduate and graduate medicine is a predictor of the location where graduates may choose to practise.

Contents
• Abstract • Introduction • Methods • Results • Discussion • Conclusion • References

---

Methods

The Canadian Post-MD Education Registry (CAPER) tracks all residents in Canada in a database. In turn, the CMA tracks all Canadian physicians. Our study linked people who left postgraduate family practice training programs and specialty programs from 1994 to 1998 to their practice

location 2 years later. The 2-year wait was to allow the majority of these graduates to settle into a family practice setting, but was before a significant amount of rural attrition had taken place.

The study's definition of "rural" is the aggregate of the populations of contiguous municipalities of < 10 000 as identified by Statistics Canada, and physicians were assigned to a rural or nonrural setting based on the practice address in the CMA database. Although many Canadian researchers agree that this safely captures most rural communities, as well as the communities that are the most rural, there is no agreement on a definition that captures all rural physicians.4,11–13 Urban is defined simply as non-rural.

The variables controlled for included sex, age on July 1st of the year of graduation in family medicine from the family practice training program, which medical school granted the MD degree, and the family practice training program by school and program type. Analysis was done by exit cohorts and then combined. The data were analysed using univariate Pearson $\chi 2$ and cross-tabulation procedures in the "SPSS 10" statistical software package.

Upon agreement with the database providers, analysis was done in-house by CAPER, names were stripped from the data tables, and no attempt was made to identify or contact individual physicians. All percentages are expressed as a percentage of valid cases (that is, trainees who were tracked in both the CAPER and CMA databases).

Contents
• Abstract • Introduction • Methods • Results • Discussion • Conclusion • References

---

Results

Overall, 20.9% of family practice trained physicians and 4.4% of specialty trained physicians were practising in rural areas 2 years after graduation. These cohorts are further analysed below.

Family medicine

Data completeness

A total of 3662 family practice trainees were identified by CAPER for the 1994 to 1998 exit cohorts. There were 574 physicians who could not be matched with the CMA for an address. Thus, data analysis was done on the remaining 3088 physicians for the 2 years post-training mark.

Gender/age

Twenty-two percent of male physicians located to rural areas, compared with 19.6% of females. The difference was not statistically significant ($p = 0.1$). Thirty percent of physicians over the age of 40 years graduated as rural physicians, but they consisted of only 6% of the exit cohorts. The

lowest percentage of those graduating as rural physicians was found in the 26- to 30-year age group (18.7%). The differences were significant ($p = 0.016$).

School of MD training

The faculty of medicine at which the MD degree was granted was significant ($p < 0.001$) and variable, ranging from 9.2% rural for physicians who entered a family medicine program after graduating at the University of Toronto to a high of 39.4% for graduates from the Memorial University of Newfoundland (Table 1).

Family practice residency training program

The choice of residency program was significant in terms of where graduates ended up ($p < 0.001$), ranging from 4.6% for a University of Toronto graduate who "went rural" to a high of 46% for graduates from Memorial University (Table 2). Université Laval, with 113 graduates, accounted for 18% of the total (Table 2).

Type of family practice training

Ninety percent of the graduating physicians were enrolled in a straight 2-year family practice program, and 21.5% of them became rural doctors. Only 6.5% of those with advanced family practice training in emergency medicine became rural practitioners. Forty percent of physicians who enrolled in both general upgrading and other family medicine training became rural practitioners. The differences were significant ($p < 0.001$).

International medical graduates

Twenty-four percent of IMGs with Canadian postgraduate training in family medicine and 4.8% of IMGs with Canadian specialty training were rural practitioners. The difference was not statistically significant ($p = 0.1$).

Regional programs

This study found that Family Medicine North (FMN) in Thunder Bay, Ont., graduates many more rural practitioners (51%) than its parent, McMaster University in Hamilton, Ont. (11%). In fact, it is the only studied program that produces more rural practitioners than urban ones. Combined rural performance at McMaster was at the Canadian average (21%). On the other hand, the NOFM program in Sudbury (12%) has less rural output than its urban parent, the University of Ottawa (18%).

How many FP/GPs are currently in rural practice?

During the study period analysis of the CMA database shows that 16.5% of existing Canadian FP/GPs practise in rural areas.

Specialty programs

Data completeness

A total of 5748 Royal College of Physicians and Surgeons of Canada trainees were identified by CAPER for the 1994 to 1998 exit cohorts (excluding IMG trainees). There were 1368 physicians (24%) who could not be matched with the CMA for an address. Thus, data analysis was done on the remaining 4380 physicians for the 2 years post-training mark.

Rural practice location

A total of only 192 (4.4%) of Canadian specialty trained physicians graduating between 1994 and 1998 chose to practise in rural settings. Because of the very small numbers involved only a limited analysis was done.

Faculty granting the MD degree

The faculty of medicine at which the MD degree was granted was a significant factor ($p < 0.01$). It ranged from 1.3% rural for physicians who took specialty training after graduating at the University of Toronto to 8.4% for Université Laval (Table 1).

International medical specialty graduates

Almost 5% (4.8%) of IMGs with Canadian specialty training were in rural practice. The difference, compared with Canadian MD graduates, was not statistically significant ($p = 0.1$).

Contents

• Introduction • Methods • Results • Discussion • Conclusion • References

---

Discussion

A significant limitation of this study relates to missing data. Sixteen percent of family practice residents and 24% of specialty training residents could not be matched in the CMA database. A review of the unmatched cases by the CMA revealed that some of these cases matched with a later practice address. This information was revealed because attainment of the CCFP or Royal College certification and transmission of this information to the CMA is required for the physician to be characterized as "active."

Although factors such as age, sex and foreign medical school have been controlled for, a descriptive study such as this one can never be free of confounders. There are many reasons why someone will choose family practice or another specialty and more reasons yet influencing where they end up on the spectrum of rural and urban practice. The role that a medical school plays in this can be described as a form of nature and nurture. The selection process in education is equivalent to the genetic code in human development. Studies of applicants to medical school show that there are 2 major variables at admission that are predictive of eventual rural practice: 1) an applicant who is of rural origin, and 2) one who has an interest in primary care.14 The role of these variables is not absolute but relative, with applicants of rural origin being 2 to 3 times as

likely to become rural practitioners as their urban counterparts.9

The nurturing role of medical school relates to how well the school presents and prepares students for family practice and especially for rural family medicine as a career.

Combined, these factors and others perhaps unknown have led to the 10-fold variation among programs, as found in this study. A perhaps unexpected finding of this study is that the Université Laval family practice program by itself produces 18% of new Canadian-trained rural family physicians. This is partly attributable to the University's rural focus throughout undergraduate and postgraduate training and its drawing and active recruitment of undergraduates from rural areas.

From a policy point of view it is reassuring that in spite of the lack of an organized approach, some institutions have succeeded in developing programs with a significant rural thrust. This makes it more likely that applying those lessons to other institutions has the potential of making a significant difference. Restricting reform to one location — even by building a 55-seat medical school in Northern Ontario and assuming that it will become as successful as Laval in placing graduates in rural locations — will only increase the number of rural doctors by 18 a year. This pales in the face of the 1600-doctor shortage identified by the CMA4 that continues to increase. Clearly only an intensive multifaceted solution, possibly involving some aspects of all the proposals before the policy-makers, will be up to the challenge of just starting to address this inequity.

Other findings

This study also undercuts some stereotypes. Although most rural physicians are male it is heartening to learn that new Canadian graduates are seeking rural placements regardless of gender, as in the Queen's study9 but unlike the US.7 Although a large number of rural family physicians also do emergency medicine, a third year in emergency medicine training rarely results in rural outcome. Another surprise is that IMGs do not preferentially choose rural settings.

Finally, the data suggest that a rural focus is not guaranteed by a regional training setting. Two split programs, those of the University of Ottawa and McMaster, were analyzed; the FMN in Thunder Bay has a much more rural output than its parent McMaster. In fact, it is the only studied program that produces more rural practitioners than urban ones.

On the other hand, the NOFM in Sudbury has less rural output than its urban parent, the University of Ottawa. This confirms earlier work by Pong and colleagues10 on a smaller sample of NOFM graduates that found that 14% of the Sudbury program's graduates were rural. Further work is needed to explain the discrepancy between the NOFM and the FMN in Thunder Bay.

Conclusion

Graduates of all programs would have been expected, by chance alone, to have had roughly similar numbers entering rural or urban practice. The effect that the Canadian medical educational system has on eventual practice location appears not to be neutral. The proportion of Canadian graduates in rural practice locations 2 years after graduating from training varies 10-fold among institutions and programs, and this variation is significant ($p < 0.001$).

Peter Hutten-Czapski, BSc, MD, CCFP, Rural physician, Haileybury, Ont., Assistant Professor, Department of Family Medicine, University of Ottawa, Ottawa, Ont.; A. Dianne Thurber, BSc, MA, Director, Canadian Post-MD Education Registry, Ottawa, Ont.

Acknowledgements: This work was funded by a grant from the Ontario Medical Association CME fund. The assistance of Lynda Buske of the Canadian Medical Association is gratefully acknowledged.

Correspondence to: Dr. Peter Hutten-Czapski, 293 Meridian Ave. Haileybury ON P0J 1K0; phc@srpc.ca

References

1. Canadian Medical Association. 1600 doctors needed in rural Canada! [press release]. The Association; 2000 Jan 31.
2. Newbery P, Thommasen A, Thommasen H. Physician retention/recruitment outside urban British Columbia. Proceedings of the 4th WONCA World Rural Health Conference, Aug 15–19, 2000, Calgary, Alta., p. 120.
3. Savard I, Rodrigue J. Recruitment and retention of new general practitioners in Quebec rural areas. Proceedings of the 4th WONCA World Rural Health Conference, Aug 15–19, 200,0 Calgary, Alta., p. 52.
4. Buske LM, Yager SN, Owen BA, Marcus L, Lefebvre F. Rural community development tools from the medical perspective: a national framework of rurality and projections of physician workforce supply in rural and remote areas of Canada. Report to Health Canada. Ottawa: Canadian Medical Association; April 1999.
5. McKendry R, for the Ontario Ministry of Health and Long-Term Care. Physicians for Ontario: Too many? Too few? For 2000 and beyond. Govt of Ontario; 1999 Dec. p. 71. (accessed 2002 Mar 12).
6. Educating physicians for rural and northern communities: a provincial plan for the new

millennium. Council of Ontario Universities, publ no 648. 1999 Apr.
7. Rosenblatt RA, Whitcomb ME, Cullen TJ, Lishner DM, Hart LG. Which medical schools produce rural physicians?. JAMA 1992;268(12):1559-65.
8. Whiteside C, Mathias R. Training for rural practice: Are graduates of a UBC program well prepared? Can Fam Physician 1996;42:1113-21.
9. Easterbrook M, Godwin M, Wilson R, Hodgetts G, Brown G, Pong R, Najgebauer E. Rural background and clinical rural rotations during medical training: effect on practice location. CMAJ 1999;160(8):1159-63.
10. Pong RW, Rowe BH, Mulloy JV. Educating physicians for rural practice in Ontario: assessing initial outcomes [presentation]. Second General Conference of the Federation for International Cooperation of Health Services and Systems Research Centers (FICOSSER). Conference on Quality in Primary Health Care and Rural Health Practice, 1996 Sept 25–27; Barcelona, Spain.
11. Leduc E. Defining rurality: a General Practice Rurality Index for Canada. Can J Rural Med 1997;2(3):125-31.
12. Rourke J. In search of a definition of "rural" [editorial]. Can J Rural Med 1997;2(3):113-5.
13. Kralj B. Measuring "rurality" for purposes of health care planning: an empirical measure for Ontario. Ont Med Rev 2000;Oct:33.
14. Rabinowitz HK, Diamond JJ, Hojat M, Hazelwood CE. Demographic, educational and economic factors relating to recruitment and retention of physicians in rural Pennsylvania. J Rural Health 1999;15(2):212-8.

© 2002 Society of Rural Physicians of Canada