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22 The Career Decision-Making Process of Medical Students and Residents and the Choice of Specialty And Practice Location: How Does Postgraduate Medical Education Fit In?

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Executive Summary

The objective of this paper is to identify how postgraduate medical education (PGME) influences career decisions of students and residents. A dynamic, complex model of the career decision-making process of medical students and residents is proposed, from entry through to medical school up to medical practice, with a view to illustrate how PGME fits in the process.

Literature was reviewed, including results of the National Physician Survey, showing lessons learned for Canadian PGME regarding challenges in recruiting physicians to practice in primary care and underserved areas.

The key messages are:

1. Canadian and international evidence shows that family medicine is perceived as a less intellectually stimulating specialty and not an attractive option for a research career. These perceptions can perhaps be seen as manifestations of “hidden curriculum” and scarcity of role models and mentors in family medicine. They are modifiable factors.

2. Evidence points at early and prolonged exposure to primary care specialties and rural rotations, preferably with a fixed base as influencing the choice of specialty and career in primary care and/or underserviced areas. Further understanding of operating mechanisms is needed, with role models, self-efficacy and informal climate as working hypotheses. Diversity of individual trajectories within and across medical schools makes it difficult to determine the most effective configurations of “doses” and exposures to primary care, clinical settings, care environments and practice in underserved areas.

3. The joint effect of specialization within family medicine and disinterest in entrepreneurship is of concern for the healthcare system. A pan-Canadian assessment of population health needs and appropriate health human resources might lead to more defined scopes of practice. Healthcare workforce planning and the mix of training should be addressed on a national level, by all relevant stakeholders. The impact on healthcare accessibility and quality of the changing preferences of students and residents towards balance between work life and personal life should be examined thoroughly and included in forecasts of medical workforce needs in Canada.

Background

Distribution of the medical workforce has been problematic for decades in most developed countries. It has given rise to a wealth of studies examining the career decision-making process of medical students and residents, i.e., decisions leading to the choice of specialty, and then to the type and location of medical practice. Understanding this process is essential, given the impact these choices have on healthcare systems. Career decision making is a dynamic (1), progressive, complex and multifactorial (2) process, which occurs in many non-linear stages and includes the choice of a specialty (family medicine, primary care specialties or others, fellowships), type of practice (patient care in hospitals, clinics, private practice or groups of family practice, community health centers; research, teaching, administration, public health; marginalized populations) and practice location (urban, rural, remote or underserved areas). Each of these stages is conditioned by the previous ones and also by the context in which it takes place. As in any complex, interactive system, it, therefore, becomes impossible to look at one component without also looking at the others.

This paper is one of 24 papers commissioned for the Future of Medical Education in Canada Postgraduate (FMEC PG) Project. The objective of this paper is to identify how postgraduate medical education (PGME), as the vehicle for preparing residents for practice, influences career decisions. We first propose a model of the career decision-making process of medical students and residents, from their entry to medical school to their transition into medical practice, with a view to illustrate how PGME fits in the process. Second, we focus on PGME as a determinant of practice decisions.

Methods

We searched two electronic databases, ISI Web of Science and Medline, for papers in English or French, published since 2007. The search was performed at two different points in time, using the following combinations of keywords:

1. "Career choice OR preferences OR specialties OR family medicine" AND "medical students OR residency OR postgraduate medical education" (October 2010, n=488).
2. "Medically underserved area/ OR rural health/ OR education, medical/ OR education, medical, undergraduate/ OR health services accessibility/ OR primary health care/" AND "career choice" (November 2010, n=459).

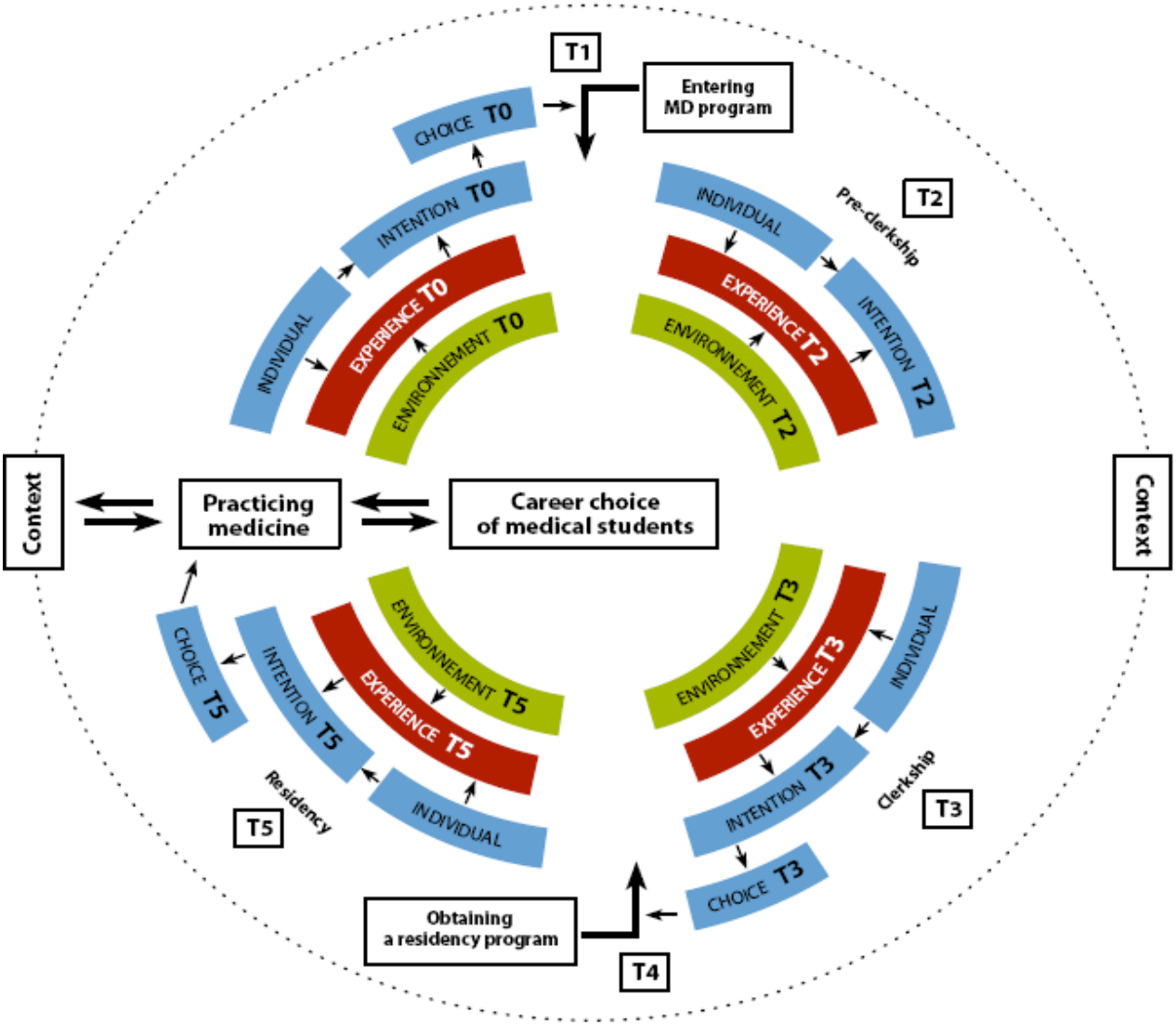
Two reviewers (JMD, SAM) independently selected relevant papers, based on articles' titles, abstracts and full-texts. Articles were included if they addressed medical students' recruitment or career issues, particularly at the postgraduate level. Overall, 791 different articles were found; of these, 166 were selected based on titles and abstracts, with 68 articles finally retained. The search strategy was supplemented by reports from the National Physician Survey and the authors' previous work. Other references came from a literature review performed in 2007 by two of the authors (NL, JMD) on the career choices of medical students (3).

Model of career decision-making process by medical students

The model is depicted in Figure 1 below. It is based on previous work conducted by the co-leads (NL, AV). Intentions regarding specialty, type of practice and location undergo many modifications from the entry to medical school to the end of residency, until their actualization in medical practice (2,4,5). Time and maturation modulate those intentions. Intentions are then formalized as choices. This whole dynamic, evolutionary process of career decision making

takes place in specific contexts: local (training programs, curricula, and medical schools), and provincial (regulation, healthcare policies, population needs, and geographic and environmental characteristics), which themselves are embedded in health systems.

Figure 1: Model of career decision-making process by medical students and residents



Before entering medical school (Time 0 or T0), students have their own personal identity, made of personality, socio-demographic characteristics, geographic, cultural and family background, marital status, prior education and training, personality, and so forth. They are more or less in debt and differ in academic performance and aptitude. These characteristics lead students to form social representations of medicine and physicians, adopt attitudes and hold values regarding medicine in general or specialties, and to define how and where they see themselves as physicians (1,6-10). These attitudes and values, in turn, can be seen as influencing the choice of a medical school and, within a medical school, of an urban or rural, remote or underserved area campus. Therefore, at entry (T1), students already have preferences or

intentions about specialties, types of practice and location (11-17), although for some students these may be rather imprecise. In some careers, upwards of 50% of medical students who indicate a career preference at entry maintain that intention at exit. Moreover, most students who switched career choices had already considered their new careers as options when entering medical school. In a number of Canadian studies, the most important influence on career choice at medical school exit is a student's entry career choice, thus speaking to the importance of societal influences and the potential role of admission policies (18-20).

During pre-clerkship (T2), initial representations transform themselves. Structural and organizational characteristics of medical schools modulate students' representations, preferences and intentions. For instance, many studies found that certain characteristics of medical schools are associated with an increased probability of practice in primary care or in rural or remote areas: explicit mission (21,22), type of funding (23,24), location in rural, remote or underserved areas (22), significant proportion of primary care physicians within the faculty (6) and among teachers (25), admission policies which favor candidates from rural, remote or underserved areas (6,10,26-29), along with rural medicine interests groups (30). Furthermore, schools' curricula, training settings and informal climate all affect the choice of specialty, type of practice and location. This informal climate, or "hidden curriculum", may be made manifest through negative comments about family medicine (10), resulting in negative perceptions among students (31-34), bringing some to switch out of family medicine as a career choice (20). During pre-clerkship, students are also affected by changes linked to the passage of time that can influence their individual characteristics and representations. These will, in turn, determine their career intentions when entering clerkship (T3). Those intentions may differ from the students' initial ones.

Once clerkship has begun (T3), students experience medical practice in different specialties and settings, thereby firming up preferences and intentions (23,28,35-40). The 2007 National Physician Survey asked medical students to what extent they agreed that their medical training program has prepared/ will prepare them adequately to select a residency training program: 49% of second-year students agreed, compared to 61% of third- and fourth-year students (41). Through those experiences, students may encounter role models in various specialties, types of practice or locations, who in turn confirm or invalidate their representations, serving to reinforce or undermine their earlier intentions and choices. Role modelling has been discussed as one mechanism by which training programs influence students' career decisions (42). A role model is a professor, resident or preceptor who influences a student to choose the same specialty, type or location of practice as hers/his (43-48). Various theories have lead researchers to consider role models as a career determinant (49,50). However, this area requires further examination, especially as it pertains to whether the identification of a model is the cause or the consequence of a choice, that is, whether the role model initiates or reinforces a choice (43). Some studies have shown that role models are more influential in primary care specialties than in others, and also that, within primary care, the effect is limited to her/his own specialty (51-53). The timing of the encounter is also important, with earlier encounter leading to greater impact (43,54).

In many Canadian medical schools, students choose the sequential ordering of their fourth-year rotations, along with elective rotations during the first half of their third year. They probably do so in accordance with their future practice intentions, in order to narrow down choices, while leaving room for new possibilities. Academic performance interferes in this process, with the best performing students more likely to have their sequential ordering and selections granted. Many studies have shown changes in students' preferences before and after clerkships (31,55). Compared to the first two years of medical education, the third and fourth years appear to have more influence on career decisions (6,45). Moreover, during those two years, evidence points to earlier and longer exposure to family practice, rural or remote areas, and non-university settings

as determinants of a practice in family medicine or in primary care, and in rural, remote or underserved areas (10,31,56-58).

The choice of a residency program through the Canadian Resident Matching Service (CaRMS) takes place during the first half of the fourth year, in the midst of clerkships. It is, therefore, possible that those rotations occurring first in the fourth year impact more on specialty intentions and choices at T3 and T4. Moreover, if we consider that the sequential ordering of fourth year rotations is established in the third year, it becomes difficult to disentangle the effects on specialty choice of the clerkships' experiences and characteristics *per se* from the timing of rotations. Studies conducted in Canada (59,60) or elsewhere (61) indicate that family medicine seems to be perceived as providing less intellectual stimulation or challenge, less likely to steer students towards research or teaching, and less likely to provide influential mentorship. These perceptions can be modified with changes in clerkship experiences, characteristics and the timing of rotations.

Individual and contextual factors are also at stake when choosing a residency program, such as personality, gender, lifestyle preferences, debt, expected income, academic performance and constraints associated with the number of residency places available in each specialty (23,37,46,57,61-77).The last two factors play a major role in the attribution of residency programs at T4. During postgraduate training (T5), residents make decisions regarding the type and location of practice and proceed to finalize choices that may differ from their intentions when entering residency. Here, provincial policies and legislation also impose constraints on type and location of practice. In Quebec, various measures are co-decided by medical associations and government representatives. Among these, the *Plans régionaux d'effectifs médicaux* (PREM) (78) define annually the number of available positions in each region, for each specialty; economic incentives (79) encourage practice in rural or remote areas, while discouraging practice in metropolitan areas. Provincial measures were found to affect interprovincial mobility (80-82).

PGME as a determinant of practice decisions

PGME is thus one component of a complex, interactive process. As such, its impact on final issues is conditioned by choices that have been made earlier in students' decision-making process. Nonetheless, PGME remains the most proximal determinant of the actualization of choices through practice in specific specialty, type and location. A recent study reported that five years after their graduation, physicians perceived their career choice was primarily dictated by their postgraduate experience (83). In this section, we will examine the role of residency programs on the choice of fellowship or subspecialty, type of practice and practice location (T5).

Choice of fellowship and subspecialty

After entering a specialty, residents may opt to complete a fellowship. Many studies have examined the factors influencing the choice of fellowship or subspecialty, for example, among residents in general surgery (84-87), internal medicine (88), urology (89), and radiation therapy (90). Results indicate that role models, mentorship and positive exposures during the last years of residency are among the top cited residency program factors in influencing decisions to enter fellowship or in confirming specialty choice (86). When considering a fellowship, expectations regarding profession and work environment are also important, with residents looking for intellectual stimulation, diversity of procedures and practice, along with an equitable payment schedule between the disciplines. Among residents in family medicine, Lu et al. (2008)(91) reported that many feel an optional third year of paid training in emergency medicine, obstetrics and pediatrics would be desirable. While this is not equivalent to subspecialty, it nevertheless

points towards a felt need for more advanced skills and was found to be related to workforce instability in rural practice (92). Lifestyle and other personal identity factors are also at stake, with men more likely to pursue fellowships (85) and choose procedure-based specialties than women (88).

Type of practice

Type of practice includes the pursuit of a research or academic career, and concentrating practice within specific types of clientele or institutions. Residents attracted to a research or academic career seem to be less likely to opt for family medicine. For instance, in the 2007 National Physician Survey-Residents (60), residents who chose non-family medicine residency programs were more likely than their family medicine resident peers to have chosen their specialty because of teaching and/or research opportunities (60). Among factors preventing an academic career or involvement in clinical research, residents report debt, limited time, poor research infrastructure, inadequate funding opportunities, lack of training and mentoring, and lower income expectations (59, 93-95). Fellows choosing academic careers tend to be older and to have had prior graduate training (95). Lack of training, mentoring and career security is related to the difficulty of maintaining a research career (59). Finally, hospital-based practice seems to be related to disinterest in private practice (96), while carrying out residency exclusively in university teaching hospitals versus other hospitals is associated with practicing in the former (97,98).

As to the scope of practice, there is a strong tendency in family medicine towards concentration in a specific area. Thirty-three percent of family medicine residents indicated their intention to specialize within an area of family medicine, mostly emergency medicine, obstetrics, palliative care or sports medicine. This number is on par with 30% of all family physicians describing themselves as having a special focus in their practice (60,82). Beaulieu et al. attributed this trend to the rapidly growing corpus of knowledge family physicians have to master to cover the traditional scope of practice and to the high value placed on specialization by professionals and society (99), coupled with an increasing lack of attraction towards entrepreneurship (100). All these considerations are important to the accessibility of primary care.

Practice location

An abundant literature exists on the choice of practice location in terms of urban versus rural, remote or underserved areas. More generally, underserved areas can be defined as health professional shortage areas, with less than one primary care physician per 3,000 population (101). This definition presents the advantage of including localities that are neither rural nor remote, situated not too far from urban agglomerations, but where recruitment and retention remain problematic throughout the years. Professional and personal reasons articulated by residents and physicians for not choosing a practice in those areas include workload, perceived lack of medical support, lifestyle issues, and family obligations. Obligations due to visa requirements, educational loan repayment program, underserved residency program location, post-residency training, underrepresented minorities, primary care specialty, income, personal growth opportunities, mission-based values and a good match between one’s interests and the community need are cited reasons for choosing to practice in underserved areas (91,101-104).

Characteristics of medical schools and training programs have been studied at length, mostly in terms of exposure to underserved areas during under and postgraduate medical education, curricula and special programs (28,29,55,105-111). Results have led to the formulation of policies orientated towards increasing medical training in non-metropolitan areas, referred to as

distributed medical education.[a] Impact on practice location is well documented (112-114) and seems to be mediated by a better preparation for life and practice in rural, remote or underserved areas (111,115-118). Self-efficacy has been suggested as one mechanism by which programs succeed in attracting students and residents to practice in these areas. Self-efficacy is defined as judgments of capabilities to organize and execute courses of action (119). Many studies in human resources management have demonstrated its influence on work adjustment and retention (120). However, few studies have been conducted on physicians.

Most traditional medical training programs include clerkships and rotations of variable length in rural, remote or underserved areas. But some are elective or can take place at variable times with individuals in the same program. It then becomes difficult to track down individual trajectories, "doses" and timing of exposures (121), and to identify the most influential components. In addition, the absence of control of students' characteristics and initial preferences or intentions renders uncertain the attribution of effects solely to the curricula. Nevertheless, results converge towards the importance of duration (longer than two months) and type of exposure (long-term rotations, fixed base), suggesting a dose-response relationship (114,122).

Discussion and summary

This paper has many limitations. It is not a systematic but a narrative literature review. As such, it entails limitations regarding selection and discrepancies in the quality of studies. Then, we chose to examine the whole career decision-making process while concentrating on how undergraduate and postgraduate medical education influence students and residents' choices. In doing so, we overlooked important factors that pertain to students' or residents' personal characteristics. We also skimmed over factors related to the choice of type of practice, and factors related to working with marginalized populations were not reviewed. Factors leading to or hindering the retention of physicians in practice locations were also not addressed. There exists an abundant literature on this issue and, given the space available in the paper, we feel we would not have been able to capture its complexity. There are also limitations inherent in the literature we reviewed. We observed that the choice of specialty is often examined in a linear fashion, in isolation from the choice of practice location, despite close interrelationships between those stages of career decision. Evidence shows that these two phenomena are influenced by similar characteristics, notably in terms of social representations, values and expectations towards the profession. Moreover, whereas the choice process varies across time, it is most often studied cross-sectionally. Longitudinal studies that follow the evolution of students' career intentions and decisions through time are rare (123). Furthermore, many studies addressed primary care in general, which includes family medicine, paediatrics and internal medicine, while in others, primary care refers to family medicine or internal medicine. This lack of homogeneity, even if justifiable (124,125), makes comparison across studies difficult and must be taken into account when generalizing results to Canada, where access to specialized care requires referral from family physicians. Finally, preference for a specialty outside of possible constraints is often confounded with choice (decision after considering constraints) or actualization of choice (effective realization: specialty actually chosen, obtained and practiced). This lack of distinction may help to explain contradictory results (6,58). This applies also to practice location. Generalization to Canadian provinces may, therefore, be limited. Despite those limitations, many conclusions can be drawn, with lessons learned for the Canadian PGME regarding primary care and practice in underserved areas.

[a] Distributed medical education is examined in commissioned paper 12: Distributed Education and Distance Learning in PGME and is not discussed in this paper, other than through general principles

Firstly, evidence points at early and prolonged exposure to primary care specialties and rural rotations, preferably with a fixed base. This holds true for undergraduate and postgraduate medical education. Controversies still remain regarding mechanisms underlying how exposure operates (10), with role models, self-efficacy and informal climate advanced as working hypotheses. It is important to open wider the black box, in order to gain more insight regarding operating mechanisms. The model proposed in this paper represents an improvement on Bland, Meurer and Moldonado's model (3) by integrating recent advances in the understanding of the process of career decision, but more importantly by putting forward its dynamics and complexity. The model might prove useful to guide comprehensive, longitudinal studies of the process of career decision making by medical students and residents.

Secondly, on the one hand, administrative data allow follow up of students and residents for factual information, such as residency programs and settings, academic performance and choices of specialty. They do not include more subjective, personal, information regarding representations, preferences or intentions along the various stages of their training. On the other hand, longitudinal surveys conducted by some universities do provide this information; however they cannot be linked to administrative data for long-term follow up. Both strategies lead to partial pictures, making it difficult to understand the complexity of the process and the interaction of its components. Thus, it appears necessary to facilitate the linkage of data collected by universities, CaRMS and national surveys, while respecting ethics, for instance through the provision of denominalized data by a central agency.

Thirdly, an additional difficulty lies in the diversity of individual trajectories, even within the same school, in predictive or explanatory models. Evidence points to the importance for specialty and practice location choices, of early exposure to primary care or underserved areas, elective rotations and sequential ordering of rotations. Yet, from entry to medical school until the completion of residency, individuals are exposed to various "doses" and timings of primary care, practice in underserved areas, clinical settings and care environments. These individual trajectories could probably be combined in different configurations of training, with some more likely than others to lead to family medicine or practice in underserved areas. Determining those best configurations remains a challenge, especially in the absence of usable, longitudinal data bases.

Fourthly, Canadian and international evidence reviewed in this paper showed that academic and research careers and family medicine were not an attractive match among students and residents. In addition, family medicine was perceived as a less intellectually stimulating specialty. These perceptions can perhaps be seen as manifestations of "hidden curriculum" and scarcity of role models and mentors within family medicine. They are modifiable factors.

Fifthly, there is a trend toward specialization within family medicine, along with a growing disinterest in the entrepreneurship aspect of the profession. These two phenomena probably have distinct causes, which should be investigated closely. Both are of great concern and their joint effect on the healthcare system is probably synergistic. A pan Canadian assessment of population health needs and appropriate health human resources might someday lead to more defined scopes of practice among physicians, leaving less room for personal choices. How this would affect the selection of family medicine as a career remains to be explored.

Sixthly, in our review, we mentioned workload and lifestyle as important factors related to career decisions. While our discussion of professional and personal factors is limited, they are intimately intertwined. The National Physician Survey results indicate that the most important factor for students and residents to have a satisfying and successful medical practice is the ability to achieve a balance between work life and personal life. The impact on healthcare

accessibility and quality of these changing preferences of students, residents and new physicians towards balance should be examined thoroughly and included in forecasts of medical workforce needs in Canada.

Finally, given the societal influences on career choice as well as the changing nature of medical education, it is important to monitor career changes on a national level. These factors, coupled with the increasing portability of medical training, speak to the need for a coherent approach to medical workforce planning. Currently, the healthcare mix of entering medical student career choices does not match the actual mix of healthcare providers, with some careers overrepresented and others underrepresented by the entering cohort of Canadian medical students (126). A rational approach to serving not only physicians but also the more general healthcare human resources needs of Canadians is needed. Using a social accountability framework, healthcare workforce planning at the national level would benefit from regular stakeholders and health leaders meetings, in order to explore factors at various levels of influence on health human resource training. In addition, arising from these meetings could be recommendations that would positively affect healthcare workforce planning into the future. Such regular meetings could involve medical school leaders, health professionals, communities and patients, and health policy makers. This forum or body could be connected to, or be part of, the Canadian Institute for Health Information (CIHI) or ministers of health meetings. Such a national approach would help rationalize the training mix of providers needed for the future, monitor changes and shifts, and allow correction at the various levels of influence in order to serve the healthcare needs of Canadians, now and into the future.

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Appendix 1: About the authors

Nicole Leduc, PhD (Public Health - Epidemiology), is Full Professor in the Department of Health Administration, in the Faculty of Medicine at the Université de Montréal, and former Director of the PhD program in Public Health (2001-09). She is a member of the *Institut de recherche en santé publique de l'Université de Montréal* (formerly, *Groupe de recherche interdisciplinaire en santé* GRIS). Her research interests are the evaluation of health interventions and organization of healthcare services. She has conducted studies on emigration of Quebec's physicians and on attraction, installation and retention of physicians in underserved areas, and on the evaluation of the distributed medical education program of the Université of Montréal. Dr. Leduc is the lead for this paper.

Alain Vanasse, MD, PhD, FRSQ research fellow, is Full Professor in the Faculty of Medicine at the Université de Sherbrooke. He is also Director of the *Axe de recherche interdisciplinaire en évaluation de la santé (ARIES)* of the *Centre de recherche clinique Étienne-Le Bel,* and Director of the PRIMUS research group on social and geographical health disparities in chronic diseases and mental health. He is a founding member of Collaborative Research on Regional Medical Education (CRRME). His prime interests are health geomatics, chronic diseases, primary healthcare and medical workforce, particularly as they relate to the access to care by vulnerable populations, such as rural and underprivileged populations and minorities. He has conducted several studies on the impact of medical programs on place and type of practice using administrative databases from University of British Columbia and Université de Sherbrooke as well as the National Physician Survey database. Many of these studies were conducted with respect to family medicine in rural, northern, and isolated areas. Dr. Vanasse is the co-lead for this paper.

Ian Scott, MD, FRCP (Community Medicine), MSc, is an Associate Professor in the Department of Family Practice at UBC. He is the Director of Undergraduate Family Practice Programs and has filled the role of Assistant Dean undergraduate medical education and Department Head in Family Practice over the past 10 years.
His research has focused on medical education, particularly medical student career choice as well as lay health perceptions of marginalized women. He has published 25 articles in peer reviewed journals in these areas. At the national level, he serves as the Chair of the College of Family Physicians of Canada Undergraduate Education Office. Dr.Scott is a contributor on this paper.

Sarah Scott, MHSc, is the Executive Manager of Governance and Strategic Planning at The College of Family Physicians of Canada and previously Manager of the National Physician Survey, Mississauga, Ontario. Mrs Scott is a contributor on the paper.

Maria Gabriela Orzanco, PhD, is a research assistant in the PRIMUS research group, in the Department of Family Medicine, at the Université de Sherbrooke. Her background is in ecology, environmental health and geomatics. She is interested in the application of geomatics and

spatial analysis to population health, especially in the methodological aspects related to the study of disparities in health and health services. Between March 2007 and June 2009, she participated in the evaluation of the impact of the undergraduate distributed medical education program of the Université de Sherbrooke on the medical workforce. Dr. Orzanco is a contributor on this theme.

Joyce Maman Dogba, MD, Health Economist, PhD (Public Health). She has been involved in clinical, social and epidemiological research in Africa and France. Her current research interests are human resources for health, maternal and child health, assessment of quality and performance in health systems, mixed methods studies and economic evaluations. Dr. Dogba is a contributor on the paper and was responsible for the literature searches, review and selection of relevant papers.

Sabina Abou Malham, BSc Nursing Sciences, Midwifery Diploma, Master Nursing Sciences, currently a PhD candidate in Public Health, Department of Health Administration, in the Faculty of Medicine, at the Université de Montréal. She is also a former professor in the School of Midwifery, at Université St-Joseph, Lebanon. Her areas of research are maternal health and strategies to improve maternal health and reduce maternal mortality in developing countries. Mrs Malham was responsible for the review and selection of relevant papers.

Appendix 2: Annotated bibliography

Beaulieu MD, Rioux M, Rocher G, Samson L, Boucher L. Family practice : professional identity in transition. A case study of family medicine in Canada. Social Science & Medicine 2008;67:1153-63.

This study explores representations of roles and responsibilities of family physicians held by future family and specialist physicians and their clinical teachers in four Canadian medical schools, using focus groups and individual interviews. Results show that two divergent directions emerge: preserving all the professions' traditional functions while adapting to changing contexts, or concentrating on areas of expertise and moving towards creating "specialist" general practitioners.

Curran V, Rourke J. The role of medical education in the recruitment and retention of rural physicians. Medical Teacher 2004;26(3):265-72.

This is an extensive narrative literature review and a position paper, whose purpose is to elaborate on some key strategies identified in the literature in order to influence efforts in rural physician recruitment and retention. Among strategies within the scope of medical schools are rural student recruitment, admissions policies, rural-oriented medical curriculum, rural practice learning experiences, faculty values and attitudes, and advanced procedural skills training.

Senf JH, Campos-Outcalt D, Kutob R. Factors related to the choice of family medicine: a reassessment and literature review. J Am Board Fam Pract 2003;16(6):502-12.

This is a systematic review on the choice of family medicine as a specialty. It builds on a previous one conducted by the authors on 1995. Thirty-six articles published since 1993 are included. Evidence that points to higher probability of choosing family medicine includes the schools' public ownership, rural background of students, lower parents' socioeconomic status, career intentions in family medicine or in a disadvantaged or rural area at entry to medical school, belief in the importance of primary care, low income expectations, no plan for a research career and higher mandatory family medicine time in clinical years.