

# What affects medical students' applications to five-year FRCPC emergency medicine programs?

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**ABSTRACT**

**Purpose:** To compare the impact of institutional and epidemiologic factors on differences in application trends of Canadian medical graduates (CMGs) from different medical schools to FRCPC emergency medicine (EM) residency programs.

**Methods:** This was a retrospective cohort study. Data from 2013-2018 were obtained from the Canadian Resident Matching Service (CaRMS) database and standardized questionnaires sent to Canadian medical schools.

**Results:** CaRMS data were available for all schools and survey data was available for 76% schools. Five schools yielded significantly higher rates of applications to FRCPC-EM programs (8.8-13.1%,  $p < 0.05$ ), and 5 schools had significantly lower rates compared to the national mean (2.9-5.1%,  $p < 0.05$ ). Increased exposure to EM (a core rotation and/or elective rotation in EM in the third year of medical school at home-school) yielded 28-55% higher application rates ( $p < 0.001$ ). The presence of an FRCPC-EM residency program at the applicant's home school, and a home school program with 5 or more CMG residency positions at a CMG's increased the application rates by 39 and 17%, respectively ( $p < 0.05$ ).

**Conclusion:** These data demonstrate a significant difference in application rates of CMGs graduating from Canadian medical schools and certain factors may affect application rates. This information could be used by medical schools to modify curricula, increase exposure to EM, and contribute towards addressing the forecasted national shortage of EM physicians.



**KEYWORDS**

CaRMS, emergency medicine, specialty interest, undergraduate medical education

## 1 | INTRODUCTION

Emergency medicine (EM) is a specialty that has been highly competitive in Canada in recent years. From 2013 to 2018, there has been a 25.5% increase in first-choice applicants to post-graduate Fellow of The Royal College of Physicians of Canada (FRCPC)-EM programs and a 30.5% increase in total applicants to FRCPC-EM programs in Canada despite a 2.5% decrease in available residency positions (1). Despite this increase in applicants in the Canadian Resident Matching Service (CaRMS), EM has also been shown to be a medical specialty with decreasing interest over the course of medical school with an overall net loss of interest from medical students (2). Only 15.9% of students entering medical school with an interest in EM end up applying to the five-year FRCPC program (3). In a 2011 study involving 178 medical students expressing interest in EM, 47.8% were interested in applying to the Certificate of Added Competence in Family Practice Emergency Medicine (CCFP-EM) pathway compared to 30.9% interested in pursuing the FRCPC-EM pathway (4).

There have been unique historical developments in Canadian EM training. In 1980, the Royal College of Physicians of Canada recognized EM as an independent specialty and the College of Family Physicians of Canada developed a certificate of enhanced EM competence (5). Since then, there have been two dedicated pathways to EM: the five-year FRCPC pathway and the three-year CCFP-EM special competency training pathway. The current state of EM practised in urban centres manifests as a predominant mixture of FRCPC and CCFP-EM trained practitioners. Historically, general practitioners (GPs) without specific EM training have staffed smaller urban and rural centres, however current trends suggest a decreasing proportion of GP staffing in emergency departments (EDs) (6). Although there are inter-provincial differences, there are more FRCPC-trained physicians than CCFP-EM physicians staffing EDs in urban academic centres overall (82.8% vs. 39.9%) (6). Conversely, the proportion of total nationwide staffed CCFP-EM physician respondents is much higher in large urban non-academic, small urban, and rural settings over-

all than FRCPC-EM respondents (59.1% vs. 17.2%) (6). The importance of a sufficient physician supply has been recently emphasized, and nationwide shortages for EM physicians are projected to increase to 1,071 physicians by 2020 and 1,518 physicians by 2025 (6). This shortage encourages the objective evaluation of medical students' interest in EM. Matching to residency in Canada can be challenging, especially to very competitive specialties. From 2013 to 2018, the 5 most competitive specialties in Canada were: plastic surgery (47% first-choice match rate), dermatology (51%), FRCPC-EM (59%), ophthalmology (68%), and otolaryngology-head and neck surgery (68%) (1). Along with the increase in competitiveness, interest in EM has been reported to decrease by more than 50% as students advance through medical school (7). This decrease may be attributed to a variety of factors. One such factor is the availability of the two different pathways for EM (FRCPC-EM and CCFP-EM). One study reported that as much as 37% of students initially interested in EM go on to apply to a family medicine (FM) residency (7). Due to the availability of the CCFP-EM pathway, students might have decided to take this option rather than the direct entry FRCPC-EM program. More medical students expressing EM interest have gone on to complete additional EM training compared to those who did not express interest in EM, 37.5% vs 16.0%, respectively (3). This further supports the claim that students do not necessarily decide against pursuing a career in EM, but rather choose to first undergo FM training before completing the CCFP-EM designation.

Differences in medical student application rates from medical schools to FRCPC-EM programs suggest possible institutional and geographic differences in EM exposure during medical school. This study aimed to determine the factors that affect the application trends of Canadian medical graduates (CMGs) applying to Canadian FRCPC-EM residency programs from the 17 Canadian medical schools. The authors hypothesized that there are significant differences in application rates to FRCPC-EM residency programs across Canadian medical schools and that certain institutional and regional factors affect application trends.

2 | METHODS

This was a retrospective cohort study and 2013-2018 data were obtained from the Canadian Resident Matching Service (CaRMS) database. The 2013-2018 time-frame was chosen as the year 2013 was the farthest back for which CaRMS data were available at the time of data collection. A standardized survey was electronically sent to each Canadian medical school in English or in French to obtain undergraduate curriculum data including when EM rotations occurred, when EM electives were available, and if there was formal point of care ultrasound (PoCUS) training at each school. Data for schools that did not respond to the survey were obtained from their institutional websites if the data were available in full. Epidemiological data regarding densities of EM physicians across provinces were obtained from Statistics Canada. Student's t-tests were used for comparative variables, and relative risk calculations were completed to determine ratios of the probability of applying to an FRCPC-EM program after exposure to vari-

ous institutional, geographic, or epidemiological factors. The authors identified six *a priori* factors that may affect application trends to FRCPC-EM programs. Motivation for selecting these factors was derived from literature suggesting that interest in competitive specialties is positively associated with early exposure to those specialties in medical school (8-9). Factors included were the presence of an FRCPC-EM program at a CMG's home school, a high quota of CMG FRCPC-EM positions available in the CMG's home school (>4), early exposure to EM in home school clerkship rotations (at least 2 weeks of core EM in the third year of medical studies), EM elective availability in the third year of medical studies at the CMG's home school, presence of formal PoCUS training during medical school, and a higher density of EM physicians in a medical student's province of study compared to the national mean (>2.4/100,000 Canadian citizens).

Factor	RR	95% CI	p
>4 CMG positions in FRCPC-EM program at home-school	1.17	1.05-1.31	0.005
Presence of home-school FRCPC-EM program	1.39	1.03-1.87	0.029
Core M3 EM rotation	1.30	1.15-1.48	<0.001
EM elective available at home-school in M3	1.55	1.25-1.94	<0.001
Hands-on PoCUS training at home-school	1.06	0.93-1.20	0.36
n EM physicians >2.4/100,000 in home-province	1.25	1.10-1.42	<0.01

**TABLE 1** Factors affecting CMGs' applications to FRCPC-EM residency programs (2013-2018). CMG: Canadian medical graduate, FRCPC-EM: Fellow of the Royal College of Physicians of Canada certified emergency medicine, RR: relative risk, CI: confidence interval, M3: third year of medical school, PoCUS: point-of-care ultrasound

### 3 | RESULTS

From 2013 to 2018, there were a total of 16,709 CMGs from 17 medical schools across Canada and 1,223 (7.3%) who applied to at least 1 FRCPC-EM program. Eleven of the 17 medical schools responded to the electronic survey (64.7%). Of the non-respondents, complete curriculum data were available online for two medical schools. Survey data were therefore available for 76.5% (13/17) of medical schools. There were statistically significant differences between the proportions of CMGs from each Canadian medical school applying to the FRCPC-EM programs. Eight medical schools had similar application rates to the national mean (6.2-8.6%,  $p>0.05$ ), 5 medical schools had significantly higher rates (8.8-13.1%,  $p<0.05$ ), and 5 medical schools had significantly lower rates (2.9-5.1%,  $p<0.05$ ). The highest single-year proportion of medical students applying to FRCPC-EM programs from a Canadian medical school was 19.8% and the lowest single-year proportion was 1.0%. Five of the six a priori variables were significantly associated with higher CMG application rates to FRCPC-EM programs including the presence of an FRCPC-EM program, more CMG positions at an applicant's home school, earlier exposure to EM, and more EM physicians per capita in an applicant's home province (Table 1). The presence of formal PoCUS training at a CMG's home school was not found to be significantly associated with higher FRCPC-EM program application rates.

### 4 | DISCUSSION

Medical schools offering core EM rotations and EM electives earlier in medical school had more students applying to the FRCPC-EM residency programs. In similarly competitive residency programs, such as plastic surgery, medical students graduating from schools that provided more exposure to plastic surgery and had plastic surgery residency programs were more likely to apply to a plastic surgery residency ( $p<0.001$ ) (8). Provinces with higher proportions of EM physicians yielded 25% more applications to FRCPC-EM programs, supporting

the idea that early exposure increases interest in pursuing a specialty. Having access to more EM physicians may increase the availability of core and elective rotations in medical school.

Having more CMG FRCPC-EM residency positions at students' home-residency programs was associated with an increase in applications from students at those schools. The number of available positions in a residency program can contribute to perceived competitiveness, which may affect medical student specialty interest (9). As medical students progress through undergraduate training, they become significantly more aware of the competitiveness of various residency programs, including emergency medicine, and may be more likely to pursue a career in EM if there are more residency positions available (10-11).

This study was a multi-year cohort study that analyzed data from sources including the CaRMS database and Statistics Canada. Data collected through institutional surveys were available for 76% of Canadian medical schools. This data should be interpreted with some limitations. The main information collected from the institutional surveys was how early medical students are exposed to EM. Although the majority of medical schools were able to provide this information, the effect of this variable on EM interest may be skewed. Furthermore, the data assumes that every medical student from each school applied for residency at the end of medical school and do not show whether the residency applications were first-choice, second-choice, or third-choice applications. The data are reflective of the stated 6 years and although many of the results are statistically significant, they show relative risk and not direct causation. It should also be noted that medical schools with 3-year curricula do not have the same opportunities for exposure to EM as compared to schools with 4-year curricula. There are multiple avenues for future investigations, including evaluating the impact of CCFP-EM on applications to FRCPC-EM, perceived EM residency intensity and/or burnout, and the perceived status of the job market at the time of residency applications. A comparison to American EM specialty trends would also be of interest, given the lower perceived EM specialty com-

petitiveness in the U.S., the various lengths of EM residency depending on the school and state, and the relatively limited number of medical schools in Canada (12). Future EM physician shortages are expected to increase, and this information could be used by medical schools to modify curricula, increase EM exposure, and contribute towards meeting Canadian health care needs.

## REFERENCES

1. The Canadian Residency Matching Service. R-1 match interactive data – CaRMS [Internet]. Ottawa: The Canadian Residency Matching Service; 2019 [cited 2021 Jan 21]. Available from: <https://www.carms.ca/datareports/r1-data-reports/r-1-match-interactive-data/>
2. Scott I, Gowans M, Wright B, Brenneis F. Stability of medical student career interest: a prospective study. *Acad Med*. 2012 Sep 1;87(9):1260-7.
3. Abu-Laban RB, Scott IM, Gowans MC. Relationship between Canadian medical school student career interest in emergency medicine and postgraduate training disposition. *Can Med Educ J*. 2017 Jun;8(3):e4.
4. Hillier M, McLeod S, Mendelsohn D, Moffat B, Smallfield A, Arab A, Brown A, Sedran R. Emergency medicine training in Canada: a survey of medical students' knowledge, attitudes, and preferences. *CJEM*. 2011 Jul;13(4): 251-258.
5. Steiner, I. P. (2003). Emergency medicine practice and training in Canada. *CMAJ*, 168(12), 1549-1550.
6. Canadian Association of Emergency Physicians. The Collaborative Working Group on the Future of Emergency Medicine in Canada Final Report [Internet]. Ottawa: Canadian Association of Emergency Physicians; 2016 [cited 2019 Jan 21]. Available from: <https://caep.ca/advocacy/collaborative-working-group-final-report/>
7. Scott IM, Abu-Laban RB, Gowans MC, Wright BJ, Brenneis FR. Emergency medicine as a career choice: a descriptive study of Canadian medical students. *Can J Emerg Med*. 2009 May;11(3):196-206.
8. Greene, May. Applying to plastic surgery residency: factors associated with medical student career choice. *Plast Reconstr Surg*. 2008 Mar;121(3):1049-54
9. Kim S, Farrokhyar F, Braga LH. Survey on the perception of urology as a specialty by medical students. *Cuaj-Can Urol Assoc*. 2016 Sep;10(9-10):349.
10. Kay-Rivest E, Varma N, Scott GM, Manoukian JJ, Desrosiers M, Vaccani JP, Nguyen LH. Securing an OTL-HNS residency: how competitive is it? Comparing medical student perceptions to actual Canadian statistics. *J Otolaryngol-Head N*. 2017 Dec 1;46(1):16.
11. Burkhardt J, DesJardins S, Gruppen L. Diversity in Emergency Medicine: Are We Supporting a Career Interest in Emergency Medicine for Everyone?. *Ann Emerg Med*. 2019 Dec 1;74(6):742-50.
12. Washington University School of Medicine in St. Louis [Internet]. Washington: Emergency Medicine [cited 2020 Aug 30]. Available from: <https://residency.wustl.edu/choosing-a-specialty/specialty-descriptions/emergency-medicine/>