

EDUCATION REGISTRY
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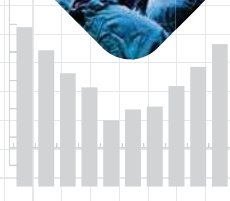
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TOTAL

HEALTH SANTÉ
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ÉTUDES
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EDUCATION
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HEALTH



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151
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EDUCATION
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EDUCATION
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EDUCATION REGISTRY
ENREGISTREMENT
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Working Paper: A Twenty-Five Year History of Post-M.D. Training in Canada

Introduction

The Canadian Post-M.D. Education Registry (CAPER) is the definitive source of national longitudinal information on trainees within the Canadian postgraduate medical education system. CAPER has been collecting data on postgraduate trainees since 1988 and is a unique source of data on physicians in training.

One area that CAPER is uniquely poised to examine is the history of post-M.D. training across Canada in terms of field of training, region of training, and gender. These values can be contextualized through the use of population data. This working paper will present a summary of the post-M.D. education landscape in Canada across the last 25 years.

Methods

Data Sources

CAPER maintains record-level data for all postgraduate medical residents and fellows in Canada. Data elements permit analysis across medical faculties and trainee characteristics, such as place of MD graduation, legal status, age, gender and field of training. Data is captured longitudinally, from the time of entry to training to the year of exit.

Description of Population

At the time of publication, the CAPER database was verified up to the end of the 2019/20 academic year. Therefore, all post-M.D. trainees that were reported to CAPER from the 1995/96 academic year to 2019/20 academic year were included in this working paper ($N = 89,448$). This working paper will break down this population of trainees by a variety of factors stored in the CAPER database.

Results

Total Population of Post-M.D. Trainees

The total number of post-M.D. trainees across Canada for the last twenty-five years is summarized in Figure 1. In addition to the raw number of trainees the per capita rate for number of physicians in training are plotted.¹ Across the entire time period the total number of post-M.D. rose slowly between 1995 ($n = 8,151$) and 2001 ($n = 8,683$) followed by a period of rapid growth in the number of post-M.D. positions from 2001 to 2015 ($n = 16,200$). The number of trainees stabilized to almost zero growth by 2019. Interestingly until 2015 the number of trainees per capita of the Canadian population tended to increase. Starting in 2016 that value started to drop in that there were slightly fewer trainees per 100,000 in training than the previous decade.

¹ Statistics Canada. Table 17-10-0005-01 Population estimates on July 1st, by age and sex. <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501> DOI: <https://doi.org/10.25318/1710000501-eng>

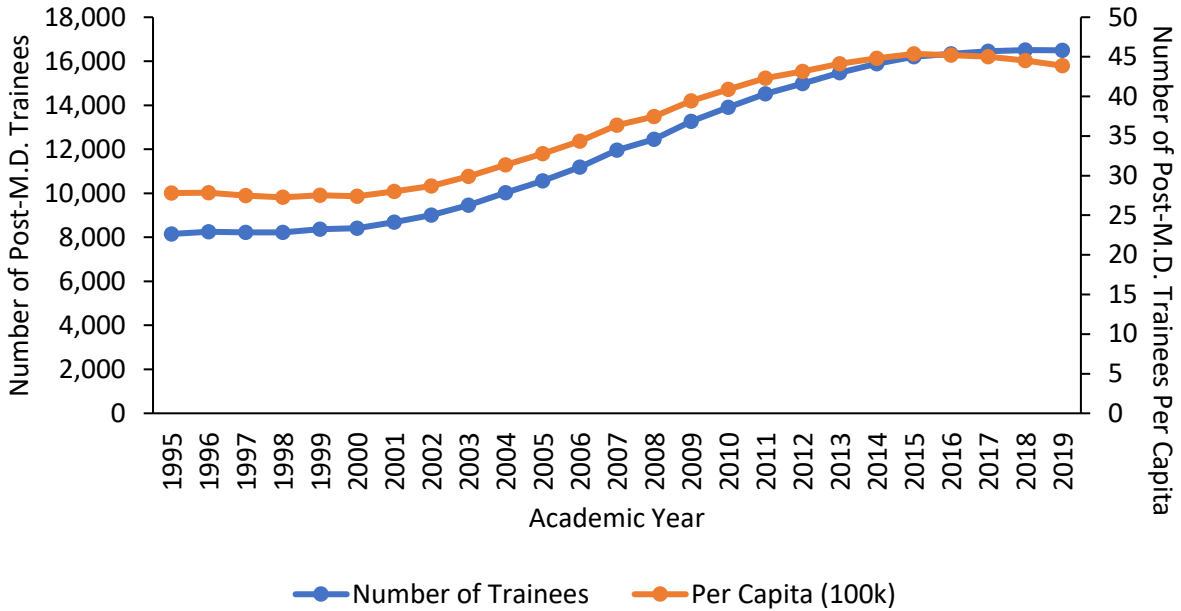


Figure 1: Number of post-M.D. trainees in Canada (blue) and per capita (orange).

Type of Post-M.D. Trainee

All post-M.D. trainees can be classified as being enrolled in either a residency or fellowship. CAPER defines a fellow as a post-M.D. trainee pursuing clinical or research training which will not be evaluated by the supervising faculty for the purpose of Canadian licensure or certification. In contrast, a resident is a post-M.D. trainee who will be evaluated for licensure at the conclusion of their program. Figure 2 summarizes the number of post-M.D. trainees by type for the last twenty-five years.

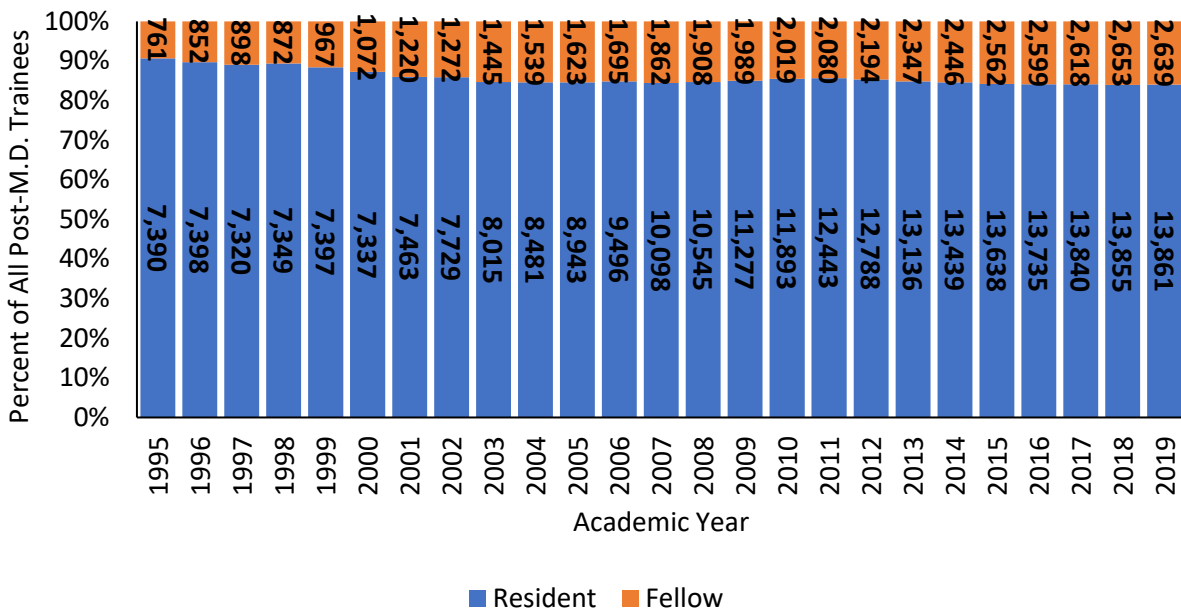


Figure 2: Proportion of residents and fellows training in Canada

Between 1995 and 2001 the proportion of fellows increased slightly from 9.3% to 14.1% of all post-M.D. trainees (Figure 2). Starting in 2002 until 2019 although the raw number of trainees increased substantially the proportion of fellows held relatively steady. Overall for every 25 post-M.D. trainees three have been registered as a fellow.

Legal Status of Trainees

An important distinction that CAPER makes when classifying post-M.D. trainees is their legal status. Specifically, trainees are classified as either Canadian Citizens/Permanent Residents (CC/PR) or Visa trainees. This distinction is important as Visa trainees are generally expected to return to their country of origin at the end of training. In contrast, CC/PR trainees are expected to enter the Canadian medical workforce. The number and percentage of trainees by legal status is summarized in Figure 3, below.

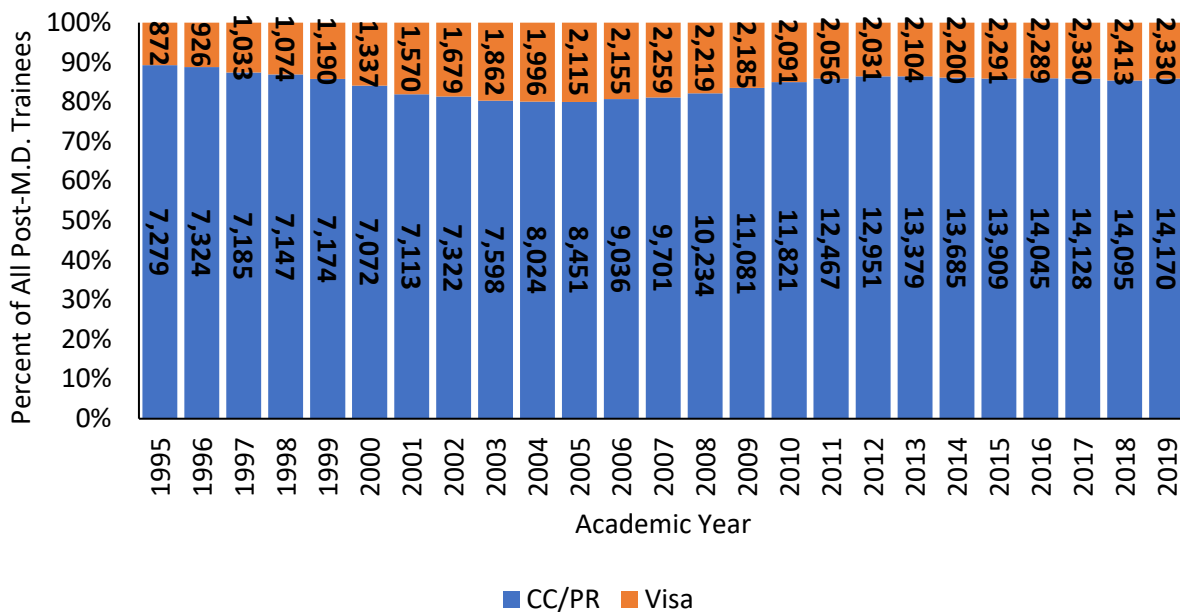


Figure 3: Proportion of post-M.D. trainees by legal status

The proportion of positions held by visa trainees increased steadily from 1995 (10.7%) peaking in 2005 (20.0%). A steady decrease was then observed from 2006 to 2014 with a stabilization lasting right until the 2019 academic year. Despite the changes in proportions the overall number of visa trainees increased year-over-year until there was a modest decrease in 2019. It will be interesting to see in future years if this is the start of a further reduction in the number of post-M.D. trainees.

An interesting aspect of CAPER data is the ability to combine a variety of variables. To that end legal status type of trainee were compared simultaneously (see Figure 4, on the following page).

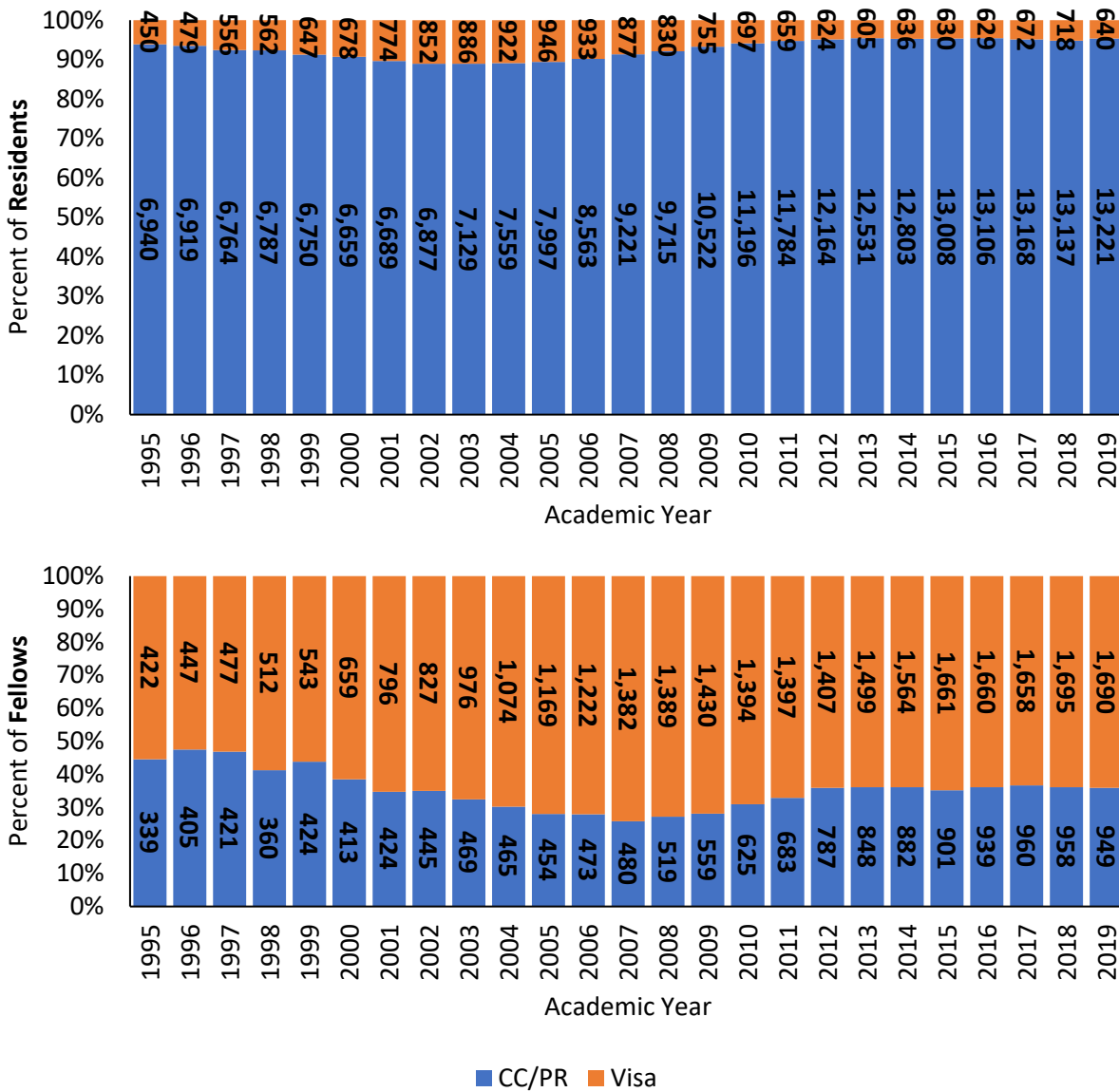


Figure 4: Proportion of residents (top graph) and fellows (bottom graph) by legal status

The proportion of visa trainees holding residency positions (Figure 4) has remained relatively stable across the last twenty-five years. In contrast, the proportion of visa trainees holding fellowship positions increased from 52% in 1996 to approximately 74% in 2007. The proportion then increased until 2012 and stabilized around 64% up to 2019.

Broad Field of Training

As of the 2019 academic year there were over 80 specialties that an individual can pursue. For the sake of simplicity CAPER typically categorizes these specialties into five categories: Family Medicine, Medical Specialties, Surgical Specialties, Laboratory Medicine, and Areas of Focused Competence (AFC).

The total number of trainees by broad specialty of training is summarized in Figure 5. Note that AFCs only started being reported to CAPER in 2016. Given the small number of trainees ($n = 70$ in 2019) it is

not possible to see them in Figure 5. In addition, there were a handful of trainees in the 1990's who were enrolled in "non-specialized training". Given the limited number these individuals were grouped into Family Medicine in the interest of parsimony.

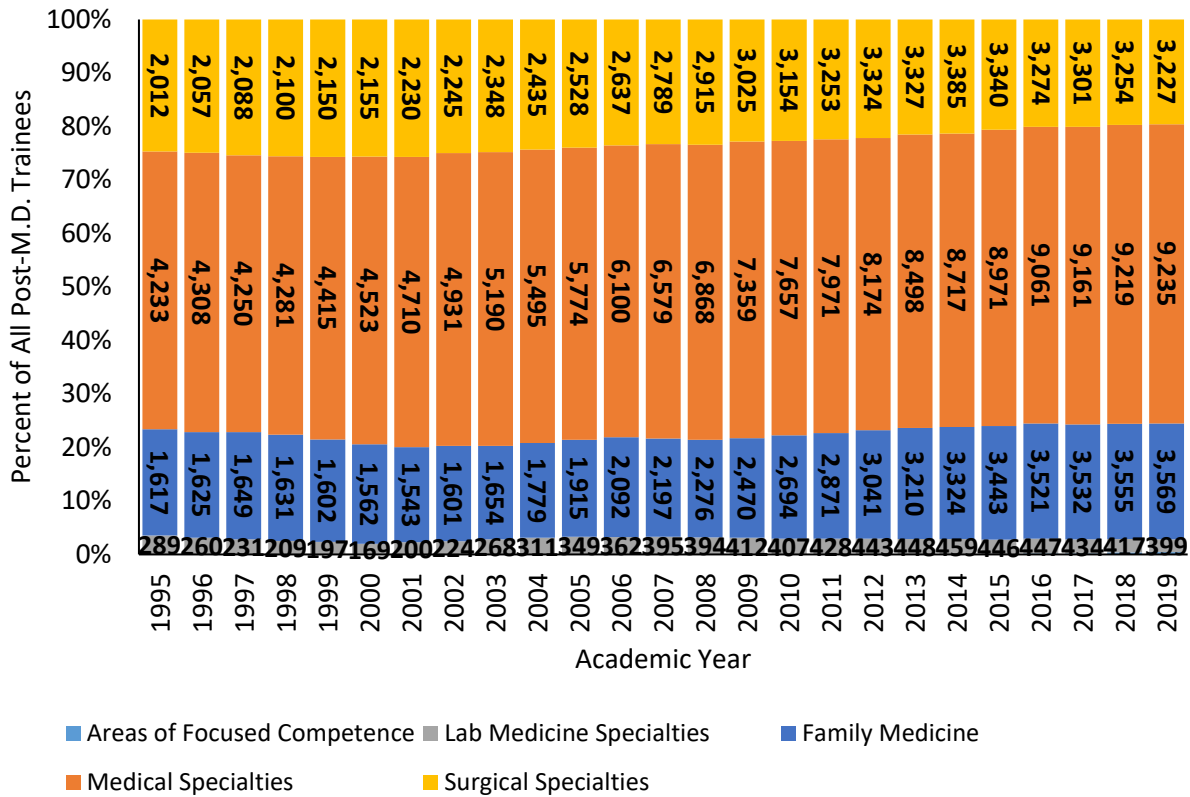


Figure 5: Number and proportion of post-M.D. trainees by broad field of training

A remarkable trend that can be clearly seen in Figure 5 is that even with the increasing number of trainees over time (Figure 1) the proportion of trainees in each broad field of training was remarkably consistent over the last twenty-five years. In general, there was little evidence of preferential growth in particular broad fields of training.

Exiting Trainees

Up to this point this working paper has focused on the total number of post-M.D. trainees. However, this number can be deceptive given that length of training varies substantially across different fields of training. For example, under typical circumstances a Family Medicine resident will complete their program of study in two years and enter the medical workforce. In contrast, a Psychiatry resident typically receives 5 years of training before certification and entry into the workforce. Therefore, in the sections above the same Psychiatry resident was counted more times than a resident in a shorter program. To examine the actual number of post-M.D. trainees entering the Canadian medical workforce the number of exits consistent with completion of training are presented in this section.

Residents and Fellows Exiting Training

The total number of post-M.D. trainees exiting training at a rank consistent with completion of training is summarized in Figure 6, below.

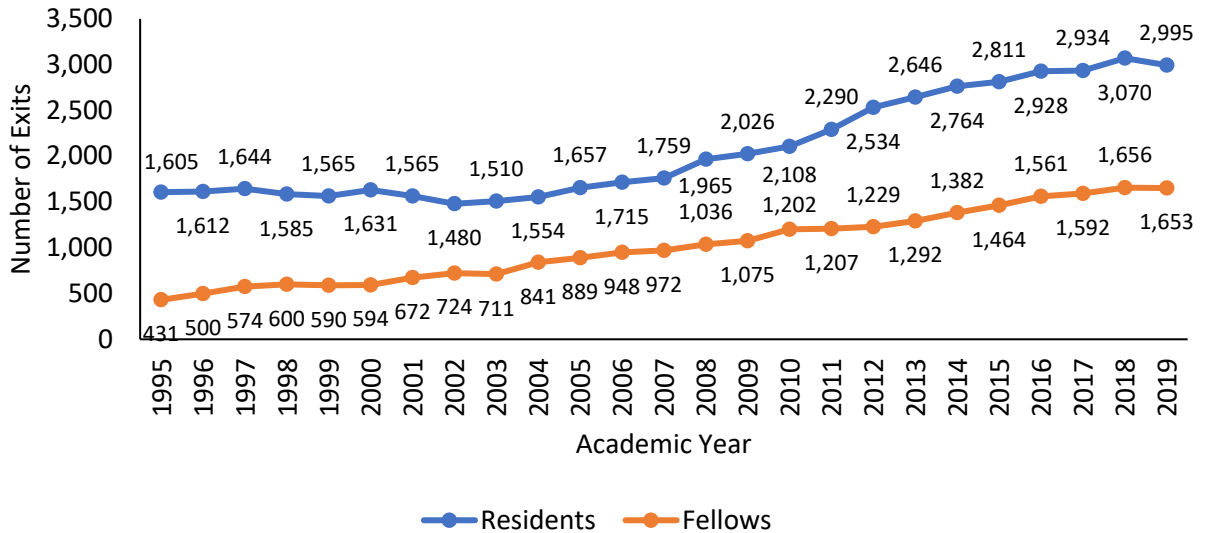


Figure 6: Number of exits from residency and fellowships

Compared to the data on the total number of trainees (Figure 1) the data in Figure 6 paints a more nuanced picture of post-M.D. training in Canada. Due to the longer length of training substantially fewer individuals exit training annually than who are actually in training. In contrast, over half of fellows in training exit their program every year. A closer look at the number of exiting residents by broad field of training should also show the impact of shorter program length on number of annual exits (Figure 7).

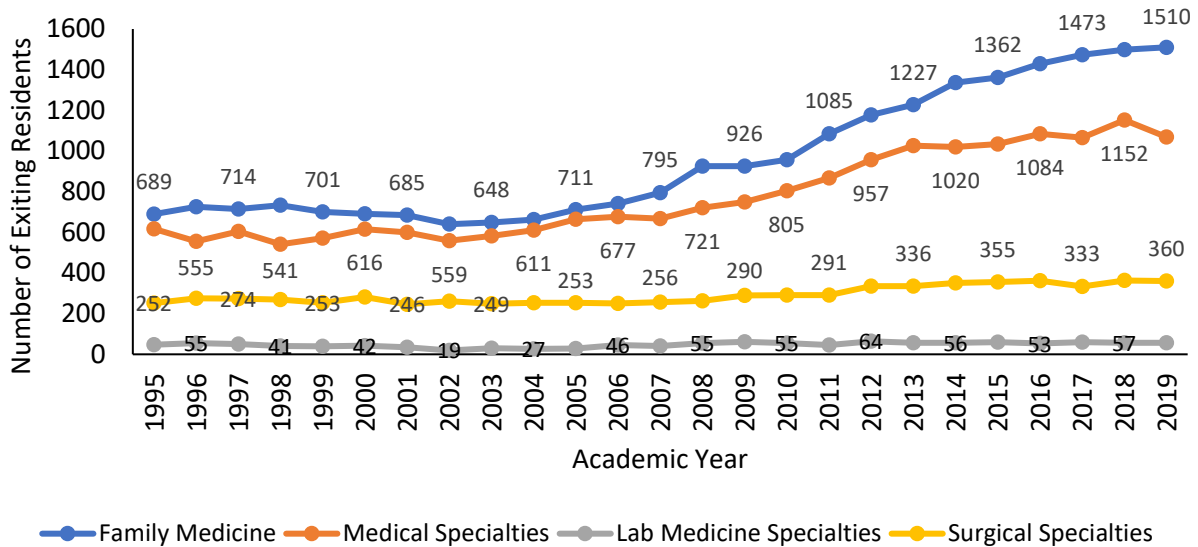


Figure 7: Number of residents exiting with a rank consistent with the completion of training by broad field of training

The impact of program length on number of physicians who exit a program annually is highlighted quite clearly in Figure 7, above. It is clear that substantially more Family Medicine trainees exit training each year compared to all other specialties including the Medical Specialties which have the highest number of trainees at any one time (Figure 5). Another interesting pattern that can be seen in Figure 7 is that the number of exits in Family Medicine started to increase in 2005. In contrast, there was little growth in Medical Specialty exits 2007. Both the Surgical Specialties and Laboratory Medicine have had relatively flat or modest growth over the same twenty-five-year period.

Number of Exits by Province

As of 2019 Canada has seventeen faculties that provide both undergraduate and post-M.D. training. Some provinces (i.e., New Brunswick and Prince Edward Island) and the territories have no medical faculties. However, it should be noted that these province and territories do fund several positions in other provinces. As would be expected the more populous provinces have more faculties. This section briefly traces the trajectory of exits by province.

The map presented in Figure 8 displays the annual exit growth rate (AEGR) for CC/PR from post-M.D. training for the last twenty-five years.²

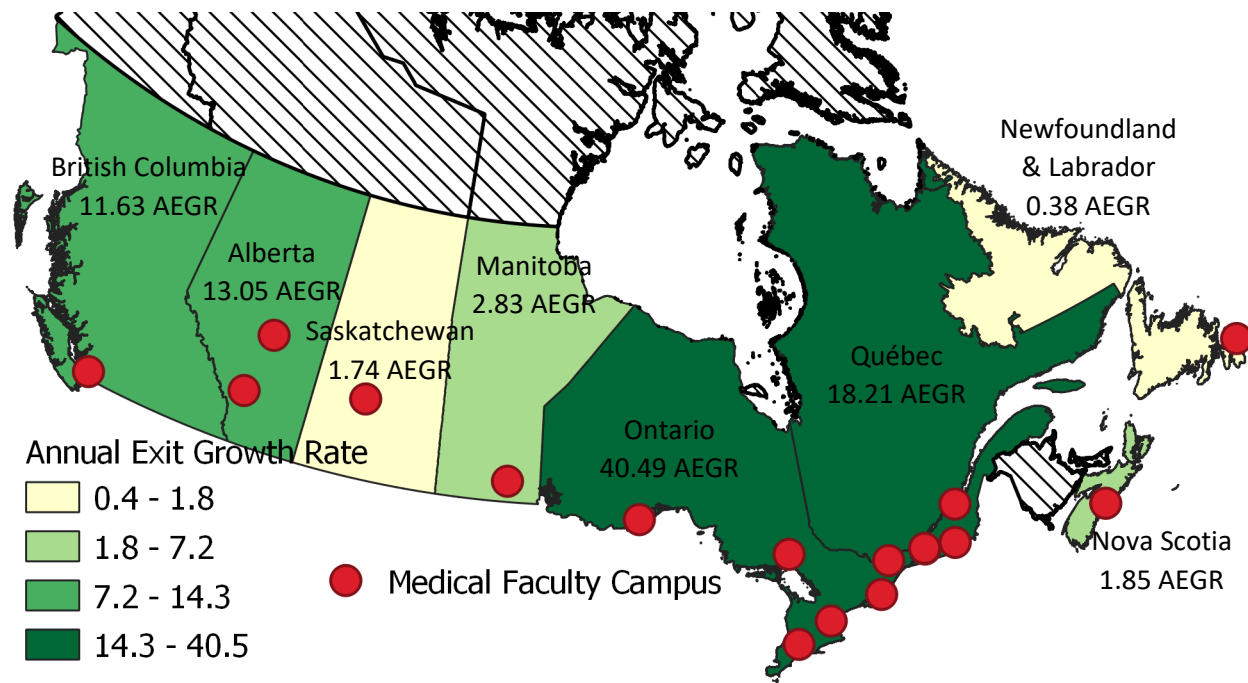


Figure 8: Location of medical faculties and annual exit growth rate (AEGR) in the number of CC/PR exits from post-M.D. training per province

The AEGR was calculated by submitting the number of CC/PR exits from the medical faculties in a specific province across twenty-five years to a simple linear regression. The regression coefficient was then reported in the above map. The AEGR indicates the typical number of exits added each year for

² The primary campuses for the University of Montréal and McGill University completely overlap at this scale. Both the Thunder Bay and Sudbury campuses of the Northern Ontario School of Medicine (NOSM) are shown on the map.

that province. For example, if a province had an AEGR of 10 this would indicate that each year an additional 10 trainees exited training then the previous year. In that province if there were 100 graduates the previous year we would expect 110 the following year. As growth rate is tied to the raw number of post-M.D. trainees it is not surprising that Ontario and Québec had the highest growth rates (Figure 8). It is interesting to note that for Newfoundland and Labrador the AEGR was not significantly different from zero ($p > .05$). In contrast, all other provinces had an AEGR greater and significantly different from zero (all $p < .05$).

Concluding Remarks

This paper has examined the history of post-M.D. training across Canada over the last twenty-five years. There was clearly a substantial increase in the number of trainees across the country in the early part of the twenty-first century. In more recent years that growth has essentially stopped. An examination of legal status, type of post-M.D. training, and broad field of training revealed unique insights into the Canadian post-M.D. training environment over the last several years. Through an examination of the different denominators (i.e., all trainees versus exits) different aspects of the post-M.D. training system came into focus. Finally, through the use of inferential statistics basic growth models for each province were examined.