

The Class of 1989 and physician supply in Canada

Eva Ryten, BSocSc, DipPol; A. Dianne Thurber, BSc, MA;
Lynda Buske, BSc

Abstract

Background: "The Class of 1989" is a study of 1722 people who were awarded an MD degree by a Canadian university in 1989. This paper reports on migration, specialty choices and patterns of post-MD training in order to assess the contribution of the graduating cohort to the physician workforce of Canada.

Methods: A longitudinal study was conducted over 7 years after graduation to trace the current location, the post-MD training history and the professional activity of the graduating cohort. Several medical professional and educational associations in Canada and the United States provided year-by-year information on field and location of post-MD training, certification achieved, whether in practice and location of practice through to spring 1996. Information from all sources was linked to a list of 1989 medical school graduates.

Results: From entry to medical school through to 7 years after graduation the cohort was diminished by about 16%. The main reason for loss was migration to other countries: 193 graduates (11.2%) were outside Canada in 1995-96. Internal migration was extensive also; for example, by 1995-96 relatively few of the graduates were located in Newfoundland or Saskatchewan. Of the 1516 graduates active in Canada in 1995-96, 878 (57.9%) were in general practice/family medicine, and only 638 (42.1%) were practising or training in a specialty.

Interpretation: The "yield" of the Class of 1989 for Canada's physician workforce is insufficient to meet annual physician inflows from Canadian sources to serve population growth and to replace retiring or emigrating physicians. As output from Canada's medical schools drops even further, the gap between requirements and supply will grow even wider.

Résumé

Contexte : «La promotion de 1989» est une étude portant sur 1722 personnes qui ont reçu un diplôme en médecine d'une université canadienne en 1989. Ce document présente un compte rendu sur la migration, les choix de spécialité et les tendances de la formation postdoctorale afin d'évaluer la contribution de la cohorte de diplômés à l'effectif médical du Canada.

Méthodes : On a effectué une étude longitudinale d'une durée de sept ans après la promotion pour suivre l'endroit où exercent actuellement les diplômés, la formation postdoctorale reçue et l'activité professionnelle de la cohorte de diplômés. Plusieurs associations professionnelles des milieux de la médecine et de l'éducation du Canada et des États-Unis ont fourni des renseignements annuels sur le domaine de la formation postdoctorale, l'endroit où elle a eu lieu, les certificats obtenus, et ont précisé si les intéressés pratiquaient et l'endroit où ils pratiquaient, jusqu'au printemps de 1996. On a rapproché l'information provenant de toutes les sources et une liste des diplômés de 1989 des facultés de médecine.

Résultats : Entre l'entrée à la faculté de médecine et 7 ans après l'obtention du diplôme, la cohorte a diminué d'environ 16 %, principalement à cause de l'émigration : 193 diplômés (11,2 %) se trouvaient à l'étranger en 1995-1996. La migration interne a été importante aussi : par exemple, en 1995-1996, il y avait relativement peu de diplômés à Terre-Neuve ou en Saskatchewan. Sur les 1516 diplômés actifs au Canada en 1995-1996, 878 (57,9 %) oeuvraient en médecine générale ou familiale, et 638 seulement (42,1 %) exerçaient la



Evidence

Études

Ms. Ryten is the former Director of the Office of Research and Information Services, Association of Canadian Medical Colleges, Ottawa, Ont., Ms. Thurber is Director of the Canadian Post-MD Education Registry, Ottawa, Ont., and Ms. Buske is Chief of Physician Resources Information and Planning, Research Directorate, Canadian Medical Association, Ottawa, Ont.

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† See related articles pages 731 and 757





profession ou suivait une formation dans une spécialité.

Interprétation : Le « rendement » de la promotion 1989 pour les effectifs médicaux du Canada ne suffit pas pour répondre aux arrivées annuelles de médecins d'origine canadienne pour répondre à la croissance de la population et remplacer les médecins qui partent à la retraite ou à l'étranger. À mesure que la production des facultés de médecine du Canada diminuera, l'écart entre les besoins et l'offre se creusera encore d'avantage.

In 1964 the Royal Commission on Health Services recommended doubling the number of places for the study of medicine in Canada.¹² To achieve the increases, 4 new faculties of medicine were established, and the existing 12 saw considerable expansion. By 1976, the year in which enrolment expansion was fully reflected in numbers graduating, 1714 MD degrees were awarded by Canadian universities, compared with 852 in 1962. Only 4 years later, in 1980, Justice Hall, who chaired the 1962 royal commission, raised the question of whether Canada was heading for a physician surplus and recommended that a physician workforce study be carried out.¹

In 1984 provincial governments performed the workforce study and recommended enrolment reductions to avoid a projected physician surplus.⁴ Again, in 1991, the Barer-Stoddart report, on the presumption that physician supply was on an ever-increasing trajectory, recommended enrolment reductions in medicine and concomitant reductions in the number of post-MD training positions.³ Not everybody was convinced. Following both the 1984 workforce study and the Barer-Stoddart recommendations, the Association of Canadian Medical Colleges (ACMC) issued responses questioning whether physician supply would continue to increase at a rate faster than the rate of population growth.^{4,5} If this were not the case, enrolment reductions were a solution to a problem that did not exist.

One of the principal arguments against enrolment reductions was a methodologic one: conclusions of surplus were based on year-by-year comparisons of physician numbers, but simple year-to-year comparisons preclude an understanding of the dynamics driving changes in numbers. Ignoring the dynamics can lead to serious errors in projecting future trends. Understanding what drives change involves more than comparing the number of practising physicians in any given year with the number of physicians practising in the previous year(s). For example, in periods when physician supply is increasing rapidly, at a minimum it is necessary to know whether numbers are increasing because extra large numbers are entering practice or because relatively few physicians are leaving practice. Longitudinal studies are the methodologic gold standard for answering such questions.

In 1986 the Canadian Post-MD Education Registry (CAPER) was established to collect longitudinal data on post-MD training in Canada. Its first full year of data collection was 1989. In 1996 it was felt that sufficient time had

elapsed to use CAPER data, combined with data for medical school graduates maintained by ACMC, to study one graduating class from exit from medical school through to practice. Cooperation was secured from several other Canadian and US medical professional organizations.

The key question of interest was: What is the "yield" of the Class of 1989? By yield is meant the number of practising physicians for Canada, their geographic location and specialty distribution. How many students must be admitted to medicine to produce a given output? Is output sufficient to meet requirements?

A second series of issues arose out of the deliberations of the National Coordinating Committee on Postgraduate Medical Training and changes to licensure requirements and their effect on the post-MD training system. The committee, with representation from provincial and territorial ministries of health and national medical organizations, was established by the Conference of Deputy Ministers of Health in 1992 to implement recommendations regarding post-MD training in Canada arising out of the Barer-Stoddart report.³ The issues raised revolved around such concerns as the length of time it takes to achieve certification in various specialties, where people do their post-MD training (in Canada or elsewhere), the impact of interruptions in training and changes in choice of field or specialty.

The results regarding physician workforce issues and the yield of the Class of 1989 are reported in this article. In an accompanying article (page 731) we report the findings on post-MD training.

Methods

"The Class of 1989" was a longitudinal study over 7 years based on record linkage from various sources. Using ACMC's list of 1989 graduates, we assigned a code number to each of the 1722 graduates from Canada's 16 faculties of medicine in 1989. In each year from 1989-90 to 1995-96 graduates of Canadian medical schools who earned the MD degree in 1989 were identified in the CAPER file on post-MD training in Canada. Codes were assigned to each trainee on the same basis as they were assigned to the ACMC list of 1989 graduates. The records were linked through the codes. Similarly, information was added to the records from the American Medical Association and the Association of American Medical Colleges on post-MD

training or practice in the United States, from the Canadian Medical Association on practice and location activities in Canada, from the College of Family Physicians of Canada and the Collège des médecins du Québec on certification in family medicine, and from the Royal College of Physicians and Surgeons of Canada and the Collège des médecins du Québec on certification in a specialty.

All the data were edited for consistency and accuracy. The final records from which statistical tabulations were derived did not include nominative information, only code numbers. All records are held by the ACMC and CAPER under conditions of strict confidentiality.

Results

Of the approximately 1780 people who entered medical schools in Canada with a view to graduating in 1989, 1722 were awarded an MD degree by Canadian universities in that year (Table 1). These 1722 men and women

are defined as "the Class of 1989." They form the cohort whose educational and professional activities were followed up until the spring of 1996.

Table 2 shows the location and professional activities of the members of the cohort in 1995-96. Of the 1722 graduates 1300 (75.5%) were in practice in Canada, and 216 (12.5%) were in residency or fellowship training in Canada. A total of 193 physicians (11.2%) were known to be in the United States or some other country. Only 15 graduates were no longer engaged in any medically related activity, including 5 who never entered residency training (i.e., they abandoned medicine immediately on graduation) and a small number who died after graduating.

Table 3 examines in aggregated form the fields of medicine in which the graduates were active in 1995-96. Because of the large number who were not in Canada, the data were disaggregated to show differences between graduates located in Canada and those in other countries. In this analysis those in training are included with those in practice in order not to distort the distributions and exaggerate the proportion in generalist fields: all but one of the graduates still in training in 1995-96 were in specialty training. Even so, 878 (57.9%) of the graduates active in Canada in 1995-96 were in general or family medicine, and 638 (42.1%) were specialists or in specialty training. The pattern for the graduates outside Canada, most of whom were in the United States, was quite different: 53 (27.5%) had careers in general or family medicine, and 140 (72.5%) had careers in specialty medicine.

Geographic mobility

Two aspects of mobility are considered: migration from one province in Canada to another, and migration from Canada to another country. In Table 4 the province or country of residence at entry to medical school, irrespective of the location of the particular medical school attended, is compared with the province or country of residence in 1995-96. Movement from a geographic jurisdiction was defined as a loss from that jurisdiction, and the place to which the person went was defined as having a gain. Net gains and net losses were defined as the difference between the numbers moving into and moving out of a geographic jurisdiction.

Table 1: Class of 1989: number of people awarded an MD degree by Canadian universities in 1989

University	No. (and %) of graduates		
	Men	Women	Total
Memorial	28	26	54
Dalhousie	60	37	97
Laval	56	69	125
Sherbrooke	42	43	85
Montréal	77	96	173
McGill	107	47	154
Ottawa	42	35	77
Queen's	49	21	70
Toronto	143	93	236
McMaster	42	60	102
Western Ontario	65	37	102
Manitoba	54	39	93
Saskatchewan	31	26	57
Alberta	69	35	104
Calgary	36	34	70
British Columbia	60	63	123
Total	961 (55.8)	761 (44.2)	1722 (100.0)
English-language universities	786 (58.7)	553 (41.3)	1339 (100.0)
French-language universities	175 (45.7)	208 (54.3)	383 (100.0)

Table 2: Location and professional activity of 1989 graduates in 1995-96

Activity	Location: no. (and %) of physicians			Total
	Active in Canada	Outside Canada	Not applicable	
In practice	1300 (75.5)	136 (7.9)	-	1436 (83.4)
In training	216 (12.5)	55 (3.2)	-	271 (15.7)
Inactive	13 (0.8)	2 (0.1)	13 (0.8)	15 (0.9)
Total	1529 (88.8)	193 (11.2)	13 (0.8)	1722 (100.0)

Two-thirds (67.5%) of the cohort members who resided in Canada at the time they entered medical school lived in the same province in 1995-96 as the one they lived in when they started studying medicine (10, 11 or 12 years earlier).

Except for Ontario, British Columbia and the territories, all Canadian jurisdictions experienced a net loss as a result of migration (Table 4, Fig. 1). In some cases the losses were substantial. For example, at the time the cohort entered medical school, there were 62 students from Saskatchewan. In 1995-96, of the 1722 graduates only 25 were in Saskatchewan. Similarly, although the graduating cohort included 40 Newfoundlanders, by 1995-96 only 19 members of the graduating class were located in that province. The large loss of 22 was hardly compensated for by inflow: only one person from any other part of Canada was located in Newfoundland in 1995-96.

Table 3: Principal field of medicine in 1995-96 by location

Principal field (aggregated)*	Location; no. (and %) of physicians		
	In Canada†	Outside Canada	Total
General or family medicine	878 (57.9)	53 (27.5)	931
Medicine or medical specialty	414 (27.3)	91 (47.2)	505
Laboratory medicine	27 (1.8)	3 (1.6)	30
Surgery or surgical specialty	197 (13.0)	46 (23.8)	243
Total	1516 (100.0)	193 (100.0)	1709

*Includes those in practice and those in residency training.

†Excludes the 13 graduates who were neither in practice nor in training in Canada.

The Class of 1989 included 34 students from the United States and 4 from other foreign countries who studied medicine in Canada on a foreign student visa. Of the US students, 27 (79.4%) were in the United States in 1995-96. All 4 of the students from other countries were still in Canada in 1995-96.

Each of Canada's medical schools had some of its graduates located outside the country in 1995-96 (data not shown). However, the proportion of graduates who left Canada was much lower for graduates of French-language universities (3.9%) than for those of English-language universities (13.3%).

Altogether 231 graduates (13.4%) had spent at least 1 year outside Canada by spring 1996 (Table 5). Before starting residency training (i.e., immediately on graduation) and on completion of residency training appear to be the peak times for moving. Relatively few graduates moved 1, 2 or 3 years after graduation.

Of those who spent time outside Canada, 38 (16.5%) were back in Canada by spring 1996. Although some of the graduates who were outside Canada in 1995-96 will return to Canada at some time in the future, the rates of return for those who left in 1989, 1990 or 1991 (i.e., long enough ago to have completed residency training and have returned by 1995-96) do not suggest that the return rate will be very high, even for those who have only recently left Canada. The most realistic assumption may be that any additional returns from outside Canada will be more than offset by continued out-migration and that the contribution of the Class of 1989 to the Canadian physician workforce is approximately 1500 people.

Table 4: Province or country of residence at time of entry to medical school compared with location in 1995-96

Province or country	Resident at entry to medical school	Resident in 1995-96	Resident at both times	Losses (resident at entry but not in 1995-96)	Gains (not resident at entry but resident in 1995-96)	Net gain or loss	Ratio 1995-96/1989
Newfoundland	40	19	18	-22	+1	-21	0.48
Prince Edward Island	7	4	1	-6	+3	-3	0.57
Nova Scotia	72	44	26	-46	+18	-28	0.61
New Brunswick	52	42	22	-30	+20	-10	0.81
Quebec	480	399	369	-111	+30	-81	0.83
Ontario	572	599	450	-122	+149	+27	1.05
Manitoba	93	59	47	-46	+12	-34	0.63
Saskatchewan	62	25	17	-45	+8	-37	0.40
Alberta	160	127	80	-80	+47	-33	0.79
British Columbia	146	195	106	-40	+89	+49	1.34
Yukon Territory	0	2	0	0	+2	+2	-
Northwest Territories	0	1	0	0	+1	+1	-
Canada	1684	1516	1136	-548	+380	-168	0.90
United States	34	186	27	-7	+159	+152	
Elsewhere	4	7	0	-4	+7	+3	
NA*	0	13	0	0	+13	+13	
Total	1722	1722	1163	-11	+179	+168	

*Not applicable/inactive in 1995-96.

Canadian physician workforce

Table 6 shows the distribution of the population of Canada and of the members of the 1989 graduating class who were in Canada in 1995-96, by province or territory. The data in this table reflect the migration reported in Table 4. If the Class of 1989 is typical — and there is no reason to suppose it is not — Newfoundland and Saskatchewan will continue to have difficulty recruiting physicians from Canadian sources. Alberta, with 9.3% of Canada's population and 2 faculties of medicine, recruited only 8.4% of the Class of 1989, an unexpected finding. For several provinces and the territories, the match between proportion of the population and proportion of the graduates located in those provinces and territories was close.

Interpretation

From entry to medical school (about 1780 people) to graduation (1722 people) to entry into the Canadian physician workforce (approximately 1500 people), this medical school entry cohort was diminished by 16%.

Seven years after graduation 15.7% of the cohort were still in post-MD training. Only 1300 (75.5%) were in practice in Canada. Another 200 or so can be expected to enter practice in Canada when they complete specialty training. The proportions of graduates who qualified in general versus specialty medicine raise a question of serious underproduction of specialists.

Both interprovincial and international migration changed the distribution of physicians compared with the distribution of medical students by province of residence at the time they entered medical school. Migration of the magnitude measured in this study would make physician

workforce plans based on province of residence at time of entry to medical school highly erroneous. This calls into question the use of admissions policies to solve physician workforce problems.

The proportion of graduates returning to Canada after 1 or more years abroad was low. In the first few years following graduation the main reason for loss to Canadian physician supply is movement abroad, as the overall retention in medicine is very high. Less than 1% of the graduates were neither in practice, nor in training nor in any other medically related activity.

The consequences of interprovincial mobility and emigration are probably, in the long run, the most intractable of the physician workforce problems highlighted by this study.

During the last 2 decades several physician workforce goals for Canada have been enunciated. We have examined the numbers and geographic distribution of the Class of 1989 to determine how they fit in with 2 policy goals: (1) long-term goal of self-sufficiency in production of physicians, and (2) equitable geographic distribution of physicians across Canada. In its fourth report to the Conference of Deputy Ministers of Health, the National Coordinating Committee on Postgraduate Medical Training enunciated a set of principles, among which was Canadian self-sufficiency. One of the recommendations was "that the Conference of Deputy Ministers of Health endorse this principle of Canadian self-sufficiency. [The committee] will continue to coordinate and monitor Canada's move to self-sufficiency including the recruitment of physicians from abroad ... [and] that the Deputy Ministers discuss with the Deans of Medical schools a means of moving toward self-sufficiency." A yardstick for assessing the degree to which the goal of self-sufficiency is being met is the extent to which the annual additions of new physicians from Canadian sources to the practice pool provide for extra physicians to meet population growth and to replace physicians who retire, die, emigrate or leave medicine. Results from a longitudinal study of a cohort of graduates is a uniquely credible source of data on how many physicians are being added to the practising physician pool each year.

The population of Canada has been growing by about 350 000 to 400 000 per year. The average annual population increase between 1986 and 1996 was 376 000.⁴ The medium growth projection of average annual population increase between 1996 and 2006 is 371 000.⁵ With a population/physician ratio of 535 (the ratio observed in 1992 was 534¹⁰), the extra annual need to meet population growth will be approximately 650 to 750 physicians per annum. The CMA physician masterfile shows that the number of retirements and deaths among physicians is currently in the range of 900 to 1100 annually; given the age structure of the physician workforce, this number will remain in this

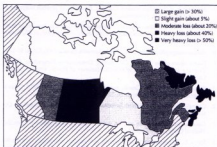


Fig. 1: Net result of mobility of the physicians who graduated from medical schools in Canada in 1989 for Canadian jurisdictions and the United States during period from entry to medical school to 1995-96 (see also Table 4). Territories excluded because no medical schools located there.

range or increase in the next few years. Between 1991 and 1996 the yearly average net migration abroad of active civilian physicians was 378.¹¹ A conservative estimate of net annual losses due to emigration is 300 to 350 per annum. Thus, summing the above requirements, in order to maintain a constant population/physician ratio new additions should approximate 1900 to 2200 each year.

The Class of 1989, which is 1 year's output from Canadian sources, will contribute approximately 1500 people to the Canadian physician workforce, considerably below the numbers required for self-sufficiency.

Since the Class of 1989 entered medical school (around 1985) there have been enrolment reductions, a relatively small number following the 1980 Hall report⁷ and much larger reductions following the 1991 Barer-Stoddart report.¹ Enrolment reductions implemented following the Barer-Stoddart report are reflected in the smaller graduating class of 1997, which consisted of fewer than 1600 people.¹² These reductions in output from Canadian faculties

of medicine are coming on stream just as the number of physicians in Canada has stopped growing and population/physician ratios are increasing.¹¹ In 1996-97 Canadian faculties of medicine admitted only 1513 Canadian citizens and permanent residents into MD programs.¹³ If only 85% to 90% of them eventually practise medicine in Canada, in the next century annual additions from Canadian sources to the physician supply will be around 1300 to 1350 only. At best, current rates of entry to medicine in Canada will supply two-thirds of physician requirements in the early years of the next century. Given these levels of entry to medicine in Canada, the gap between requirements and supply will widen in coming years. The goal of self-sufficiency will not be met in the foreseeable future.

This work would not have been possible without the provision of data by the Canadian and US medical professional associations mentioned in the study. The contributions of Leslie Forward, Canadian Post-MD Education Registry, to the systems and data processing aspects of this study are gratefully acknowledged. We thank Dale Yeatman, Association of Canadian Medical Colleges, and Leslie Forward for doing the coding related to post-MD training and certification and other jobs too numerous to mention.

Table 5: Number of graduates who had spent at least 1 year outside Canada by 1995-96 and number back in Canada in 1995-96

Year graduate went abroad	No. of physicians	Location in 1995-96; no. (and %) of physicians	
		In Canada	Not in Canada
1989	61	10 (16.4)	51 (83.6)
1990	12	3 (25.0)	9 (75.0)
1991	9	3 (33.3)	6 (66.7)
1992	13	3 (23.1)	10 (76.9)
1993	28	8 (28.6)	20 (71.4)
1994	73	11 (15.1)	62 (84.9)
1995	35	0 (0.0)	35 (100.0)
Total	231	38 (16.5)	193 (83.5)

Table 6: Location of the graduates active in Canada in 1995-96 compared with population distribution in 1996

Province or territory	% of population of Canada, July 1, 1996	
	% of population of Canada, July 1, 1996	% of graduates
Newfoundland	1.91	1.3
Prince Edward Island	0.46	0.3
Nova Scotia	3.15	2.9
New Brunswick	2.54	2.8
Quebec	24.66	26.3
Ontario	37.55	39.5
Manitoba	3.82	3.9
Saskatchewan	3.41	1.6
Alberta	9.31	8.4
British Columbia	12.87	12.9
Yukon Territory	0.11	0.1
Northwest Territories	0.22	0.1
Canada	100.00	100.0

Source: reference 8.

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Reprint requests to: Association of Canadian Medical Colleges, 774 Echo Dr., Ottawa ON K1S 5P2; fax 613 730-1196; oris@acmc.ca