PHYSICIANS AND SURGEONS

Lindsay Hedden

Physicians and Surgeons

INTRODUCTION

Focused on improving the health and wellbeing of individuals, families and communities, physicians are perhaps the most readily recognizable health-care practitioners. They diagnose and treat injuries, illnesses and impairment, and also counsel patients on how to maintain and improve their health. Physicians have a long history in Canada, with regulation and licensing first occurring in Ontario in 1865. By the late 19th century, medicine had become the dominant health-care profession in Canada; however, the 1962 Saskatchewan doctor's strike and the rise (and regulation) of other health professions have since tempered the dominance of the physician profession *(Coburn, Torrence & Kaufert, 1983)*.

Physicians are trained in stages, beginning with a generalized medical degree followed by post-graduate training in one or more specialty areas, which become the focus of their practice. Primary care physicians (also known as family medicine physicians) are usually a patient's first point of contact with the Canadian health-care system. They also coordinate additional health-care services patients may require, ensuring continuity of care and access to specialized services *(Health Canada, 2011)*. In contrast, medical and surgical specialists focus on specific diseases, certain patients, or methods of diagnosis and treatment. They generally treat patients who have been referred to them by a primary care physician.

Physicians in Canada practice in a variety of settings, including solo or group practices, hospitals, long-term care or rehabilitation facilities, public or community health centres, and laboratories or academic research centres. They are independent contractors who are most commonly paid on a fee-for-service basis, although other forms of payment, such as salary or sessional fees, are becoming increasingly common.

The number of physicians in Canada is growing rapidly. There are currently more than 91,000 active physicians practising across the country, just over half of whom are family physicians *(Canadian Institute for Health Information, 2020)*. Although this number was increasing by more than 4% each year, this has since slowed to a 1.8% increase in 2019.

This chapter introduces the practice of medicine in Canada and focuses on the following topic areas:

- The history of the profession;
- Branches of medicine (specialties and subspecialties);
- Education and training for physicians;
- Regulation and standards for medical practice;
- Physician income;
- Supply and demographics of Canada's physician population; and
- Two current topical issues related to the physician profession.

HISTORICAL TIMELINE

- **1818:** First medical board established
- **1820:** First Canadian medical school established (Montréal Medical Institution, which would become McGill University)
- **1865:** Self-regulatory licensing legislation passed
- **1867:** Canadian Medical Association founded
- **1869:** College of Physicians and Surgeons of Ontario established
- **1871:** Women granted admission to medical school
- **1912:** *Canada Medical Act* passed, creating national medical licensing standard, establishing the Medical Council of Canada and restricting the number of providers
- **1929:** Royal College of Physicians and Surgeons of Canada established
- **1954:** College of General Practice of Canada founded
- **1962:** Saskatchewan establishes medical insurance plan for physician services, resulting in a 23-day doctors' strike
- **1964:** Royal Commission on Health Services recommends national health insurance for physician services
- **1966:** *Medical Care Act* proclaimed, provides cost-sharing for provincial/territorial medical insurance plans
- **1972:** All provinces have medical insurance plans with federal cost sharing
- **1984:** *Canada Health Act* passed, preventing user fees and extra billing by physicians

HISTORY OF THE PROFESSION

PHYSICIANS IN THE 18TH AND 19TH CENTURIES

Prior to Confederation, medical practice in Canada was essentially unregulated; physician training was based on apprenticeship rather than formal education and there were no standardized competency assessments *(Medical Council of Canada, 2014a)*. The practice of medicine was shared between physicians and other providers, such as homeopaths and eclectics (early naturopathy) *(Gidney & Millar, 1982)*, and was generally done in patients' homes rather than clinics or hospitals, which were reserved to shelter the impoverished and treat the dying.

Beginning in 1795, there were several failed attempts were made to pass legislation to license physicians, creating a medical monopoly and preventing non-physician practitioners from treating patients. It wasn't until 1818 when the first medical board in Upper Canada (Ontario) was created. This board established the first procedure for physician certification *(Coburn et al., 1983)*. The first Canadian medical school was then established in 1820: the Montréal Medical Institution, which eventually became McGill University *(Coburn et al., 1983; Gidney & Millar, 1982)*.

Self-regulatory licensing legislation was passed in 1865 and then revised in 1869 with the founding of the College of Physicians and Surgeons of

THE SPECIALIZATION OF MEDICINE

In Canada, the medical profession started as a single homogenous occupation, with medical students first being trained through unregulated apprenticeships. In 1929, the Royal College of Physicians and Surgeons of Canada was founded and offered two specializations: general medicine or general surgery. Today, the College formally recognizes 93 certified specialties, subspecialties, and areas of focused competence. *(Royal College of Physicians and Surgeons of Canada, 2017)*. This dramatic increase in specialization can be problematic for patients, fragmenting their care and making it challenging to navigate the health system *(Goldbloom, 1978)*. However, increased specialization can also bring improvements to patient outcomes, particularly those related to surgical procedures and the volume-outcome relationship *(Chowdhury, Dagash, & Pierro, 2007)*.

Ontario *(Coburn et al., 1983)*.[1] The Canadian Medical Association (CMA), a national advocacy group for physicians, was founded in 1867 as the first national medical body in Canada *(Canadian Medical Association, 2014a)*. The CMA would become a forum for interpreting developments affecting the medical profession (such as the health insurance movement) and formulating a unified response from the physician profession *(Coburn et al., 1983)*.

Women in the medical profession

As a result of the movement led by Emily Howard Stew and Jennie Kidd Trout, women won the right to be admitted to medical school; however this didn't occur until 1871, a full 51 years after the first medical school was established. This achievement was then followed by the founding of the Ontario Medical College for Women (eventually affiliated with the University of Toronto) in 1883. However, women remained a minority in medicine, comprising less than 4% of the workforce until the early 1960s.

PHYSICIANS IN THE 20TH CENTURY

The federal *Medical Care Act* was passed in 1912, creating a uniform standard for physician assessment across all provinces to be administered by the newly formed Medical Council of Canada (MCC) *(Medical Council of Canada, 2014a)*. Despite this uniform standard, the regulation of physicians remained a provincial and territorial function.

The MCC created a credential that provinces could accept as the basis for granting licences; however, it was not until 1992 that provincial licensing bodies, medical schools and the MCC all endorsed a national standard for portable eligibility for licensure.

By the 1920s, medicine was practiced very differently in Canada, with physicians working primarily in hospitals or offices rather than in patients' homes or clinic offices *(Coburn et al., 1983)*. Other medical occupations were not as dominant as the physician profession at this point; however, the chiropractic and osteopathy movements had started to emerge, challenging the emerging medical monopoly. The power of these groups was restricted in 1925 with the passing of the *Drugless Practitioners Act (McKay, 1925)*.

Government-administered health insurance

Early in the 20th century, there were calls for increased government involvement in health care—and specifically for national health insurance. Despite a 23-day doctors' strike in protest, in 1962[2] government-administered health insurance covering physician services was established in Saskatchewan. The strong opposition to universal health coverage was driven by ideologically conservative doctors as well as organized medicine's thriving private insurance business *(Marchildon, n.d.)*. Physicians viewed government-administered insurance schemes as a serious threat to their incomes and

1 Prior to the passing of self-regulatory licensing, a university degree conferred the right to practice medicine (Coburn et al., 1983).

2 The coverage of physician services was an expansion on an existing provincial health insurance plan for hospital services, which was founded under Tommy Douglas in 1946. By 1961, all 10 provinces had public insurance programs for hospital and diagnostic services; however, this coverage did not extend to physician services (Turner, 1958).

THE RISE AND FALL OF MEDICAL DOMINANCE

Coburn and colleagues (1983) argue that medicine rose to dominance in the late 19th and early 20th centuries, essentially creating a medical monopoly by weeding out other 'paramedical' professions and establishing medicine as a homogenous, regulated occupation. Pharmacists agreed to a ban preventing them from counter-prescribing medications, making them effectively subordinate to medicine by the early 20th century *(Coburn et al., 1983; Gidney & Millar, 1982)*. Shortly after, chiropractic and osteopathy moved into Canada, but attempts at passing legislation that would increase their power and access were unsuccessful. Midwifery was gradually outlawed. Other medical professions, such as physiotherapy, occupational therapy and others are relatively new and "were born under medical control" *(Coburn et al., 1983; Gidney & Millar, 1982)*.

By the post-Second World War period, the medical profession was at the height of its power, with its dominance enshrined in legislation, institutionalized and embedded in law and statute *(Alford, 1977)*. Members of the profession exerted influence through lobbying as well as "formal and informal organizational channels with governments and state bureaucracies" *(Coburn et al., 1983)*.

The decline of medical hegemony began with the Saskatchewan doctor's strike of 1962, in which the profession lost the unilateral right to define its own fee schedule and was forced to negotiate this with the government. Other health-care providers—nurses, pharmacists, dentists, optometrists and others—began seeking and establishing their own autonomy, which also "chip[ped] away at medical authority" *(Coburn et al., 1983)*.

Although medicine has lost some of its power and autonomy since the Second World War, it still remains the most powerful and influential health occupation in Canada. Additionally, many of these laws and statutes, created when the health-care system looked very different, are still in effect today.

professional autonomy *(Naylor, 1986)*. The strike ended with the signing of the *Saskatoon Agreement*, a compromise between physicians and the provincial government that granted physicians practice autonomy and fee-for-service remuneration—in exchange for the provision of universal, publicly administered health services *(Marchildon, n.d.; Naylor, 1986)*.

In 1966, the *Medical Care Act* was introduced, allowing each province to establish universal health insurance and mandating 50-50 cost sharing for health care between the federal and provincial governments, which extended to physician services *(Health Canada – Strategic Policy Branch, 2011)*. By 1972, all provincial and territorial hospital insurance plans had been extended to include coverage for physician services.

Preventing the rise of a two-tiered system

In 1979, Justice Emmett Hall conducted a review of health services in Canada. His report, *Canada's National-Provincial Health Program for the 1980s*, noted that the use of extra billings by doctors as well as hospital user fees were creating a 'two-tiered system' that threatened accessibility *(Hall, 1980)*. This report led to the development and passing of the 1984 *Canada Health Act*, which prevents physicians from charging user fees or extra billing for insured services—and cemented Canada's health system as (primarily) publicly funded and privately delivered *(Deber, 1998)*.

RECENT HISTORY OF THE PROFESSION

For-profit clinics

Since the passage of the *Canada Health Act*, the medical profession has been largely supportive of maintaining Canada's publicly funded, publicly administered system, with the CMA lobbying the federal government for funding increases (via provincial transfers). A small but growing group of physicians has elected to opt out of the publicly funded system, delivering for-profit care to those willing to pay for

these services. The first for-profit clinics opened in 1993, growing since then to include 42 magnetic resonance imaging/computed tomography clinics, 72 surgical clinics and 16 boutique physician clinics—with all patients paying out-of-pocket for their care.

Challenges to Medicare

Medicare has also recently faced legal challenges from physicians fighting to have for-profit clinics play a larger role in the Canadian health-care system. The first, Chaoulli v. Quebec, was a 2005 Supreme Court of Canada decision which found that prohibiting the purchase of private insurance when waiting times for some services covered by provincial health insurance were long violated the *Quebec Charter of Rights and Freedoms (Flood, 2006)*. The second challenge, led by Dr. Brian Day, owner of the for-profit Cambie Surgery Clinic in British Columbia, seeks to strike down provincial health legislation that limits for-profit delivery of medically necessary services on the grounds that this violates the *Canadian Charter of Rights and Freedoms (Canadian Doctors for Medicare, 2014)*. If successful, physicians in British Columbia could extra-bill for publicly insured services. This case is ongoing, and is expected to make its way to the Supreme Court of Canada.

BRANCHES OF MEDICINE

Physician education in Canada begins with the completion of a generalized medical degree. Following that, physician trainees complete post-graduate training in a specialty area, which then becomes the focus of their practice. Specialties recognized in Canada, which are listed in Table 1, cover three categories: family medicine, medical specialties (including both clinical and laboratory specialties) and surgical specialties.

TABLE 1: Royal College of Physicians and Surgeons of Canada Specialties and Subspecialties

Specialties	Subspecialties
Anesthesiology	Critical Care Medicine
Dermatology	Neuroradiology
Diagnostic Radiology	Paediatric Emergency Medicine
Emergency Medicine	General Internal Medicine
Internal Medicine	Cardiology
Medical Genetics	Clinical Immunology/Allergy
Neurology	Endocrinology/Metabolism
Nuclear Medicine	Gastroenterology
Paediatrics	Geriatric Medicine
Physical Medicine/Rehabilitation	Hematology
Psychiatry	Paediatric Hematology
Public Health/Preventative Medicine	Infectious Diseases
Radiation Oncology	Medical Oncology
Anatomical Pathology	Nephrology
General/Clinical Pathology	Respirology
Hematologic Pathology	Rheumatology
Medical Microbiology	Occupational Medicine
Neuropathology	Adolescent Medicine
Cardiac Surgery	Developmental Paediatrics
General Surgery	Neonatal-Perinatal Medicine
Vascular Surgery	Child and Adolescent Psychiatry
Neurosurgery	Forensic Psychiatry
Obstetrics/Gynecology	Geriatric Psychiatry
Ophthalmology	Medical Biochemistry
Otolaryngology	Thoracic Surgery
Orthopaedic Surgery	Colorectal Surgery
Plastic Surgery	General Surgical Oncology
Urology	Paediatric General Surgery
	Gynecologic Oncology
	Maternal-Fetal Medicine

FAMILY MEDICINE SPECIALTY

Primary care physicians—also known as family physicians or general practitioners[3]—provide comprehensive and continuous care to patients and families. Family physicians prevent and treat illness and injury, and are also responsible for primary mental health care, maternity care, rehabilitation, palliative care and health promotion *(World Health Organization, 2008)*. The 'gatekeepers' of Canada's health system, family physicians also coordinate other forms of health care for patients, including access to medical or surgical specialists, or to imaging and laboratory testing.

To better meet the needs of their community of patients, some family physicians may include a specialized area of focus in their practice; for example, sports medicine, women's health, mental health, substance abuse treatment and others. Training for these areas of focus ranges from an additional three months to a year *(College of Family Physicians of Canada, 2013)*.

MEDICAL AND SURGICAL SPECIALTIES

Unlike family physicians, medical and surgical specialists focus their practice on a particular disease category, diagnostic or treatment technique, class of patient or particular body system. Surgical specialties are defined as the areas of medicine where diagnosis or treatment of illness or injury is primarily accomplished through the use surgical techniques. Medical specialties, on the other hand, are generally 'non-operative'.

The Royal College of Physicians and Surgeons of Canada (RCPSC) currently defines the requirements for specialty education across 70 areas (see Table 1) *(Royal College of Physicians and Surgeons of Canada, 2014b)*. Subspecialties, special programs and areas of focused competence allow physicians to further refine their practice activity to a more narrow scope. Subspecialties are defined as areas "with a more focused or advanced scope that builds upon broad-based knowledge defined in a parent specialty" *(Royal College of Physicians and Surgeons of Canada, 2014b)*. Areas of focused competence are even more narrow: "a highly focused discipline… with specific and narrow scope… that does not meet the criteria of a subspecialty" *(Royal College of Physicians and Surgeons of Canada, 2014b)*.

Medical specialists may function as primary care providers and generalists for certain patient populations and/or for patients during certain life stages. For example, pediatricians may be the primary care physicians for young children.

EDUCATION AND TRAINING

The process for becoming a physician in Canada is outlined in Figure 1 *(Canadian Medical Association, 2015)*.[4] Depending on specialty, training can last nine to 12 years, beginning with the completion of high school and ending with the successful completion of a residency-training program before starting medical practice.

MEDICAL SCHOOL

In Canada, there are 17 faculties of medicine, with the majority requiring an undergraduate degree with courses in biology, organic chemistry and physics for admission. Many also require a passing score on the standardized Medical College Admission Test (MCAT).

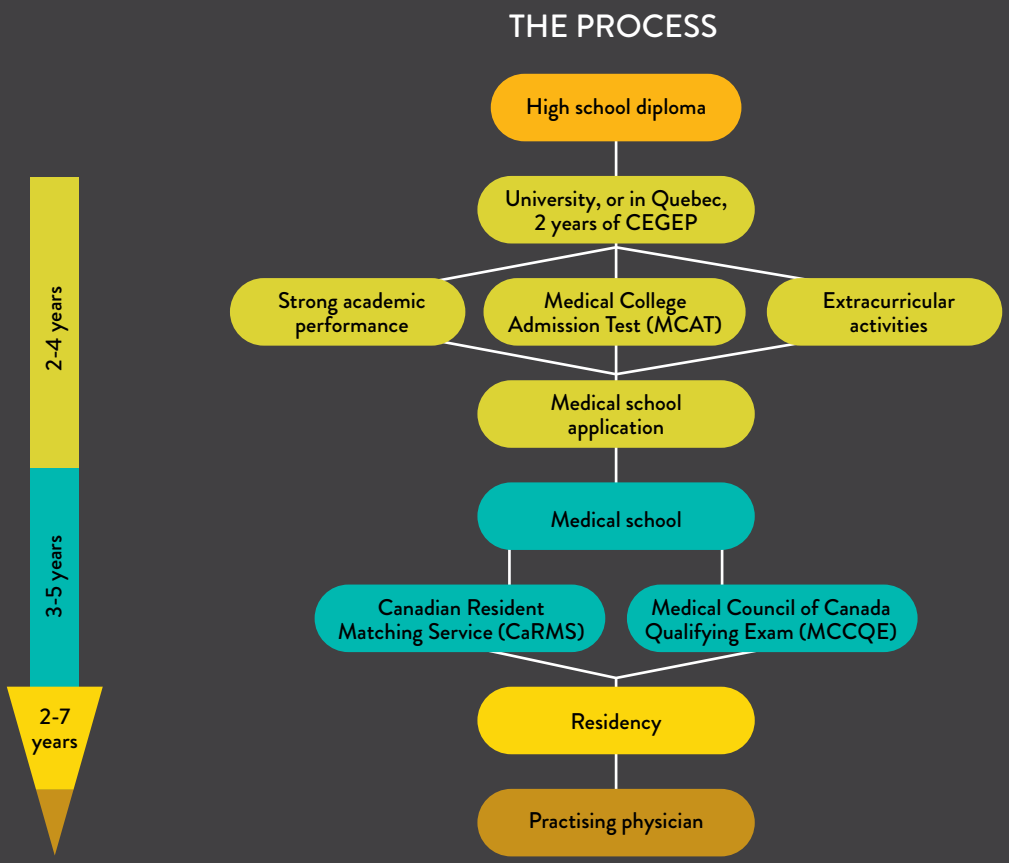
Admission into medical school is generally based on undergraduate grades, volunteer history, a personal statement or autobiographical sketch, MCAT scores and a personal- or panel-based interview.[5] Medical schools in Quebec, the University of Ottawa and the Northern Ontario School of Medicine do not require applicants to complete the MCAT exam because it is not offered in French. McMaster University does not require applicants to complete the exam, either.

3 General practice has been phased out of physician training. In 1993, the College of Family Medicine of Canada (CFMC) replaced the one-year rotating general practice internship with a two-year family medicine residency program *(Evans & McGrail, 2008)*.

4 Graduates of medical schools outside of Canada do not follow the same licensure process. This specific process is outlined in this chapter's section on international medical graduates.

5 Specific requirements for admission at individual universities can be found at https://www.afmc.ca/publications-admission-e.php.

Figure 1: Becoming a physician in Canada



Source: Canadian Medical Association, 2015 *Becoming a physician*.

CANADIAN FACULTIES OF MEDICINE

Memorial University
Dalhousie University
Université Laval
Université de Sherbrooke
Université de Montréal
McGill University
University of Ottawa
Queen's University
University of Toronto
McMaster University
University of Western Ontario
Northern Ontario School of Medicine
University of Manitoba
University of Saskatchewan
University of Alberta
University of Calgary
University of British Columbia

Competition for spaces

Medical school application pressure in Canada is very high, with some schools having more than 30 times as many applications as spaces available (see Figure 2, *Association of Faculties of Medicine of Canada, 2017)* and the average acceptance rate hovering around 10% *(Evans, Barer, & Hedden, 2014)*. In 2018/19 there were over 14,000 applicants for under 2900 positions (Association of Faculties of Medicine of Canada, 2019). Ontario medical schools consistently have the highest application pressure.

Some faculties of medicine have residency requirements that reserve the majority of their spaces for residents of their own province.

The cost of education

Medical school tuition fees vary widely by province, ranging from $3731 to $25,487 per year in 2019. Universities in Quebec offer Quebec residents reduced rates of an average under $4000 per year. Universities in Ontario charge the highest tuition, all over $23,000. International applicants are subject to higher fees, which reach $113,000 per year at some universities *(Association of Faculties of Medicine of Canada, 2019).*

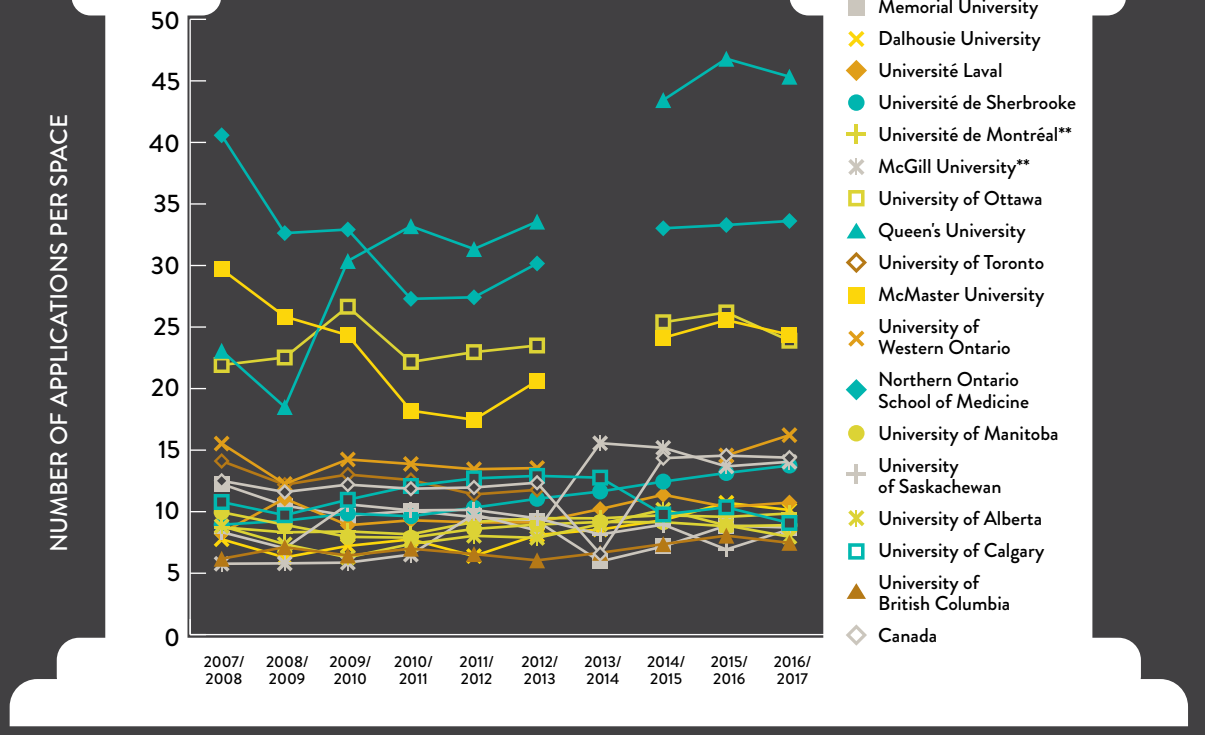
Duration of study

Medical school is a four-year program, with the exception of programs at McGill University and the Université de Montréal (which offer a preparatory year) and at McMaster University and the University of Calgary (which offer compressed three-year programs). For McGill University and Université de Montréal, students who complete the preparatory year are automatically admitted to the full four-year Doctor of Medicine (MD) program, although the preparatory year is not required *(Association of Faculties of Medicine of Canada, 2013)*.

The first two years of medical school are typically spent learning the fundamentals of medicine, including physiology, anatomy, genetics, pharmacology and pathology, the social determinants of health, epidemiology, and legal aspects of medical practice. Teaching methods vary by university, but usually include a combination of didactic lecturing and problem-based learning, combined with patient simulations. The remaining years are typically spent on a rotating clerkship, where students work with patients while being supervised by physicians and residents. Rotations include internal medicine, obstetrics and gynecology, pediatrics, psychiatry, surgery and emergency medicine. Some universities offer additional rotations, allowing students to explore specialties of their own interest.

The three-year accelerated programs offered by McMaster University and the University of Calgary are exceptions to this learning path. These schools use problem- rather than lecture-based learning, which is case-based and conducted in small groups. Students also focus on clinical skills and professional competencies for the entire program rather than the final years only.

Figure 2: Ratio of applications to available medical school spaces, 2007/08–2016/17



Source: Association of Faculties of Medicine of Canada, 2017

EXAMINATIONS AND POST-GRADUATE TRAINING[6]

After successfully completing medical school, candidates must write the Medical Council of Canada's Qualifying Examination (MCCQE, Part I). A one-day test that assesses the core competencies of graduates before they enter post-graduate residency training programs, the MCCQE covers important knowledge, clinical skills and attitudes outlined as part of the Medical Council of Canada's objectives (http://apps.mcc.ca/Objectives_Online/objectives.pl?loc=home&lang=english).

Post-graduate residency programs

Entry to post-graduate residency training is facilitated through the Canadian Resident Matching Service (CaRMS). The matching process begins with candidates reviewing descriptions of all programs participating in the match in that year and submitting applications to those they are interested in. Programs interview their selection of candidates and create a rank order list. Candidates create their own rank order. CaRMS uses an algorithm that attempt to place an applicant into his/her most preferred program, providing applicants with their best possible outcome. While the total number of residency spots is slightly greater than the number of students graduating from medical school in a given year, the specific number of spots in a specific discipline or location may vary, leading to a potential mismatch between students' preferences and available training spots.

6 Post-graduate training for graduates of medical programs outside of Canada is discussed in International Medical Graduates section of this chapter.

INDIGENOUS MEDICAL STUDENTS

Due to myriad complex reasons, Indigenous peoples have, on average, much poorer health than non-Indigenous Canadians *(Waldram, Herring & Young, 2006)*. Access to culturally appropriate care is hugely problematic, particularly in rural and remote communities *(Statistics Canada, 2013)*, where more than 50% of Canada's Indigenous peoples live. It is estimated that Canada needs at least 2,000 Indigenous doctors—up from the 200 who are currently practising—to maintain and improve the health of Indigenous Canadians *(Morrison, 2008)*. Canada's population is 4.3% Indigenous, while only 2.3% of students who graduated from MD programs in 2013 were Indigenous *(Government of Canada & Social Development Canada, 2006; American Association of Medical Colleges, 2013)*. Because of this, Canadian medical schools have enacted policies targeting the recruitment and retention of Indigenous students, and nearly all now have a number of seats reserved for Indigenous applicants; however, recruitment remains a challenge as many reserved spaces are going unfilled.

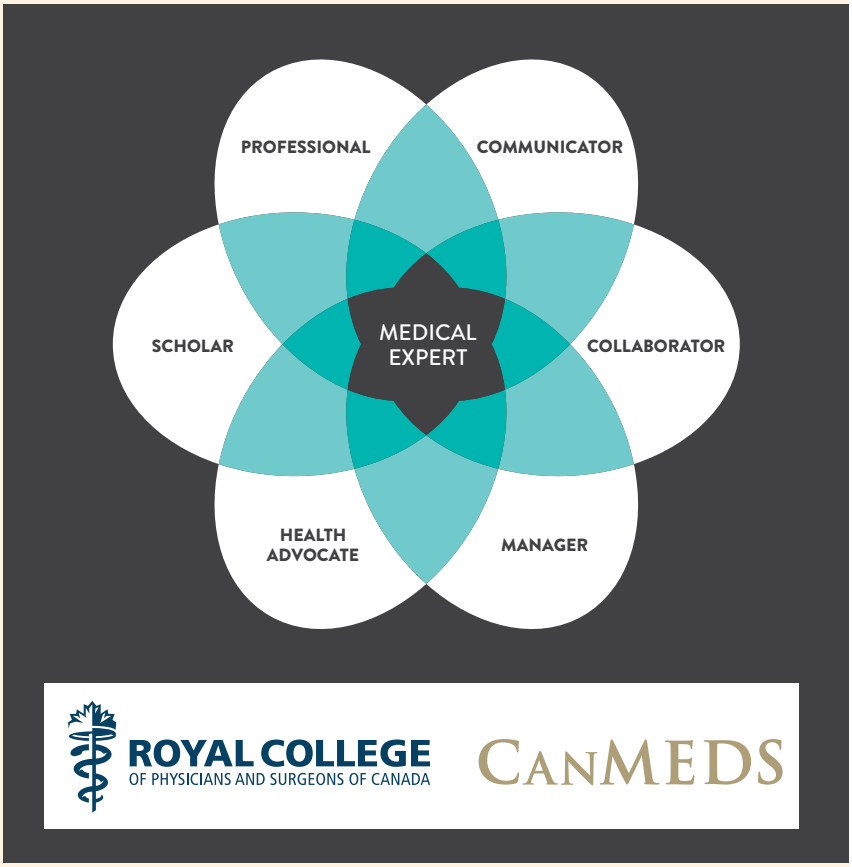
The topic of Indigenous health is also being integrated into standard medical school curricula through the efforts of the Indigenous Physicians Association of Canada, which worked with the Association of Faculties of Medicine of Canada to develop and implement a framework for core competencies for Indigenous health *(Indigenous Physicians Association of Canada & Association of Faculties of Medicine of Canada, 2009)*.
The Royal College of Physicians and Surgeons of Canada's 2012-2014 Strategic Plan identified the need to focus on populations at risk, including Indigenous Peoples. They have struck an Indigenous Health Advisory Committee, and are planning to establish a joint task force with the College of Family Physicians of Canada to development and implement educational measures, professional development opportunities, and policy and practice advancement in the area of Indigenous Health *(Royal College of Physicians and Surgeons of Canada, 2018)*.

Post-graduate residency programs vary in length based on specialty, from two years for family medicine to as many as six years for several surgical residencies (e.g., cardiac surgery or neurosurgery). Most programs, however, last five years. The College of Family Physicians Canada (CFPC) accredits family practice residency programs, while the RCPSC accredits all other specialty residency programs.

After one year of residency training, residents complete the second part of the MCCQE exam: the Objective Structured Clinical Examination. If completed successfully, the resident becomes a Licentiate of the Medical Council of Canada but is unable to practice independently until their residency training and a certifying examination have been completed. Written in the final year of residency, certifying examinations are administered by the CFPC or the RCPSC (depending on whether the residency was in family medicine or another specialty), and consist of written and oral components. Practice licenses are granted by provincial Colleges of Physicians and Surgeons, which act as the medical regulatory authority in each province and territory.

CANMEDS PHYSICIAN COMPETENCY FRAMEWORK

The CanMEDS Physician Competency Framework describes the roles and related competencies for specialist physicians—and forms the basis for all specialty-specific physician training *(Frank & Danoff, 2007; Royal College of Physicians and Surgeons of Canada, 2005)*. The framework outlines competencies for each of the various roles that specialist physicians fill in order to meet societal needs: communicator, collaborator, manager, health advocate, scholar, professional and medical expert *(Frank & Danoff, 2007; Royal College of Physicians and Surgeons of Canada & Advocate, 2005)*. The framework also defines and describes each role, and outlines a unique set of key and enabling competencies.



Educational standards for post-graduate residency programs, accreditation, resident assessment, examinations and competency maintenance were all revised to incorporate the roles and competencies outlined in the CanMEDS framework *(Frank & Danoff, 2007)*. CanMEDS has also been integrated into the RCPSC's Maintenance of Competence program *(Royal College of Physicians and Surgeons of Canada & Advocate, 2005)*.

In Fall 2012, the RCPSC began a three-year process to update the 2005 CanMEDS framework, with the goal of aligning the framework with a competency-based approach to medical education. The updated framework will include new competency milestones, content and themes for each role *(Royal College of Physicians and Surgeons of Canada, 2014a)*.

CanMEDS has also been adapted for family medicine. CanMEDS-Family Medicine (CanMEDS-FM) guides curriculum and forms the basis of the design and accreditation of family medicine residency programs with the ultimate goal of improving patient care *(Saucier, 2009)*.

CONTINUING MEDICAL EDUCATION

To maintain certification, the RCPSC and the CFPC require continuing medical education. Called Maintenance of Certification (MOC) and Maintenance of Proficiency (MAINPRO), respectively, both programs consist of earning education credits over a span of five years. Credits can be earned by attending workshops or conferences, teaching, conducting research or publishing papers in peer-reviewed journals.

INTERNATIONAL MEDICAL GRADUATES

International medical graduates (IMGs) are graduates of MD programs from medical schools outside of North America. IMGs who have competed their MD but not post-graduate medical training (residency) typically seek out opportunities for residency training upon arrival in Canada *(Association of Faculties of Medicine of Canada, 2014)*. IMGs who have completed both their MD programs and post graduate training at recognized programs internationally search for 'practice eligible' routes that would allow them to begin caring for patients immediately under a full or restricted medical licence *(Association of Faculties of Medicine of Canada, 2014; Walsh et al., 2011)*.

DEMOGRAPHICS OF IMGS

The distribution of IMGs' countries of origin has changed dramatically in recent years. Since 1996, the number of IMGs who completed their MD degrees in Europe has decreased, while the number who trained in Asia, the Middle East and the Caribbean has increased *(Walsh et al., 2011)* A much greater proportion of IMGs also originates from South Africa now compared to a few decades ago (see Figure 3, *Canadian Institute for Health Information, 2009*).

As of 2019, approximately 26% of Canada's physicians graduated medical school internationally (29% of family medicine physicians and 22% of specialists), a slight increase from 24% in 2008 *(Canadian Institute for Health Information, 2020)*. This marks a change from the consistent decline in the percentage of IMG physicians between 1972 and 2007 *(Canadian Institute for Health Information, 2009)*.

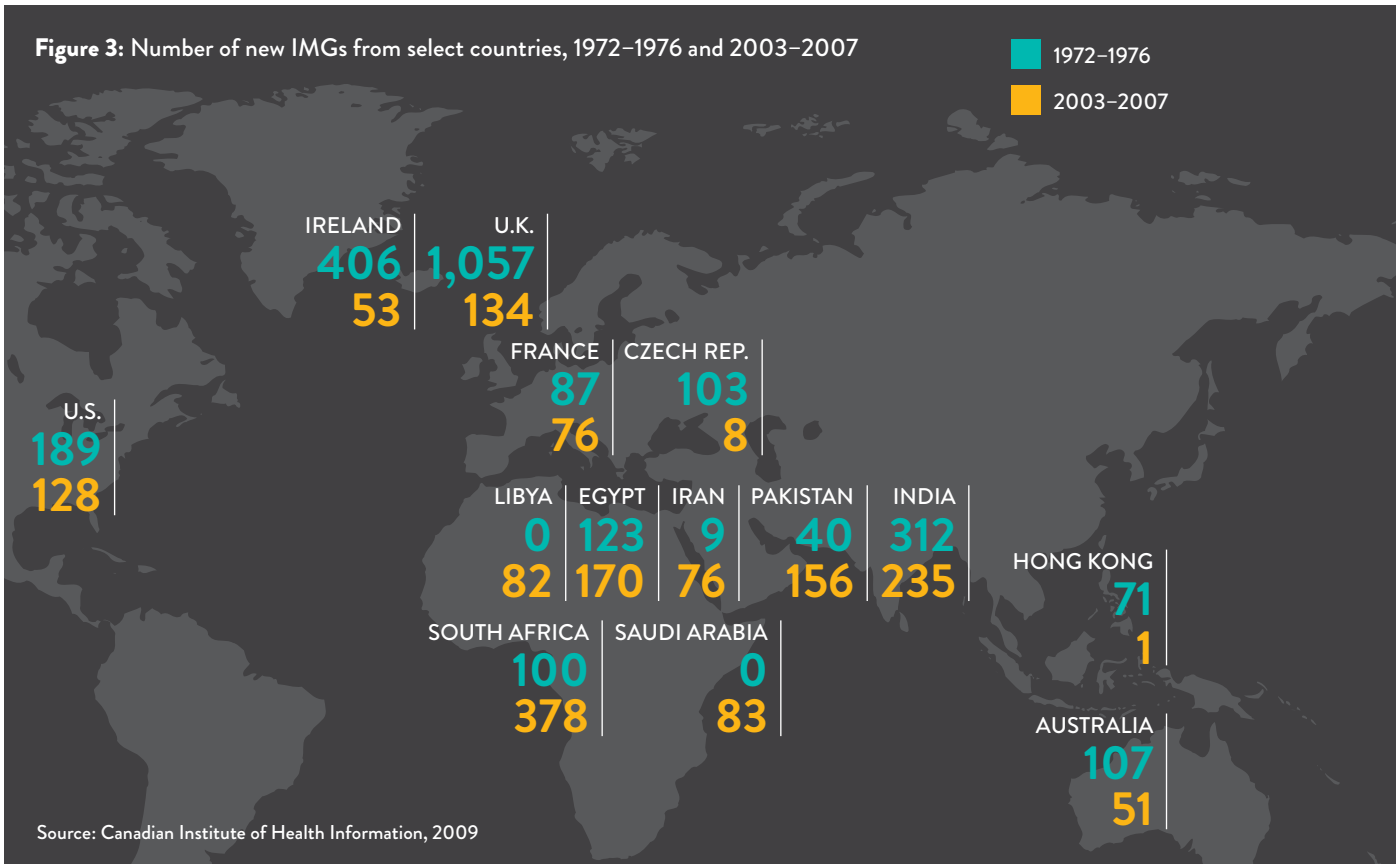


Figure 3: Number of new IMGs from select countries, 1972–1976 and 2003–2007

The distribution of IMGs across Canada is not uniform, with some provinces relying on these physicians much more heavily than others. Saskatchewan (50%) and Alberta (35%) have the largest proportion of IMGs in their workforce, while Quebec has the smallest (9%) *(Canadian Institute for Health Information, 2020)*. Physicians in rural locations are more likely to be IMGs than are physicians in urban locations, a phenomenon that is more pronounced among new physicians *(Canadian Institute for Health Information, 2009)*.[7]

ROUTES TO LICENSURE FOR IMGS

To be eligible for a residency match, IMGs must be graduates of a university listed with the International Medical Education Director; they must also be a Canadian citizen or permanent resident, and be proficient in English and/or French *(Canadian Resident Matching Service, 2014b)*. IMGs' credentials must be formally assessed by the MCC *(Canadian Health Workforce Network, 2013)* and must pass the MCC Evaluating Examination (MCCEE) to apply for a residency position through the CaRMS *(Medical Council of Canada, 2014b)*. The MCCEE is also a prerequisite for the MCC Qualifying Examinations.

Additional assessments for IMGs include language proficiency testing and the National Assessment Collaboration Exam (NAC), which would be written following completion of the MCCEE *(Medical Council of Canada, 2014b)*.

Between 1993 and 2004, there were very few dedicated residency slots for IMGs *(Walsh et al., 2011)*. However, the number of IMGs participating in residency programs doubled to 1,915 between 2004 and 2009—representing a 500% increase since 1993 *(Walsh et al., 2011)*. Between 2009/10 and 2018/19, the number of post graduate trainees increased from 4067 to 4593, over one quarter of all post graduate trainees (Associations of Faculties of Medicine of

IMGS: A SOLUTION TO RURAL PHYSICIAN SHORTAGES?

Rural and remote communities in Canada are facing physician shortages *(Canadian Collaborative Centre for Physician Resources, 2013)*. To address this problem, some provinces and territories have developed policies to recruit IMGs to live and work in these underserved communities *(Audas, Ryan & Vardy, 2009)*. There are two recruitment methods: provisional licences and return of service agreements. In both cases, the IMG agrees to work in the community for a temporary period, at least until they attain their full licence to practice *(Vardy, Ryan & Audas, 2008)*. The goal of these programs is to integrate the physician into the community and establish long-term practices; however, in many cases this has actually created a revolving door phenomenon—physician after physician completes their required service time and then moves to an urban area *(Milne et al., 2014)*.

Studies suggest that retention rates for IMGs are no better than—or may actually be poorer than—those for physicians trained in Canada *(Mathews, Edwards & Rourke, 2008)*. The results of the 2013 National Physician Survey found that IMGs are more likely to want to leave a rural community in favour of an urban area (19% compared to 8% for Canadian-trained physicians). Another study found that after five years, fewer than 20% of the physicians working on provisional licences remained in the community where they started *(Dove, 2009)*.

IMGs do not present an easy solution to Canada's physician distribution problem, and provisional licensing programs may actually worsen the issue as graduates of these programs—more often than not—end up leaving rural communities in favour of urban areas *(Canadian Foundation for Healthcare Improvement, 2013)*.

7 This trend is consistent across Canada, with the exception of Ontario and Quebec, where physicians in urban locations are more likely to be IMGs than are physicians in rural locations (Canadian Institute for Health Information, 2009).

Canada, 2019). Despite these increases, however, applications for residency spots continue to far outstrip supply.

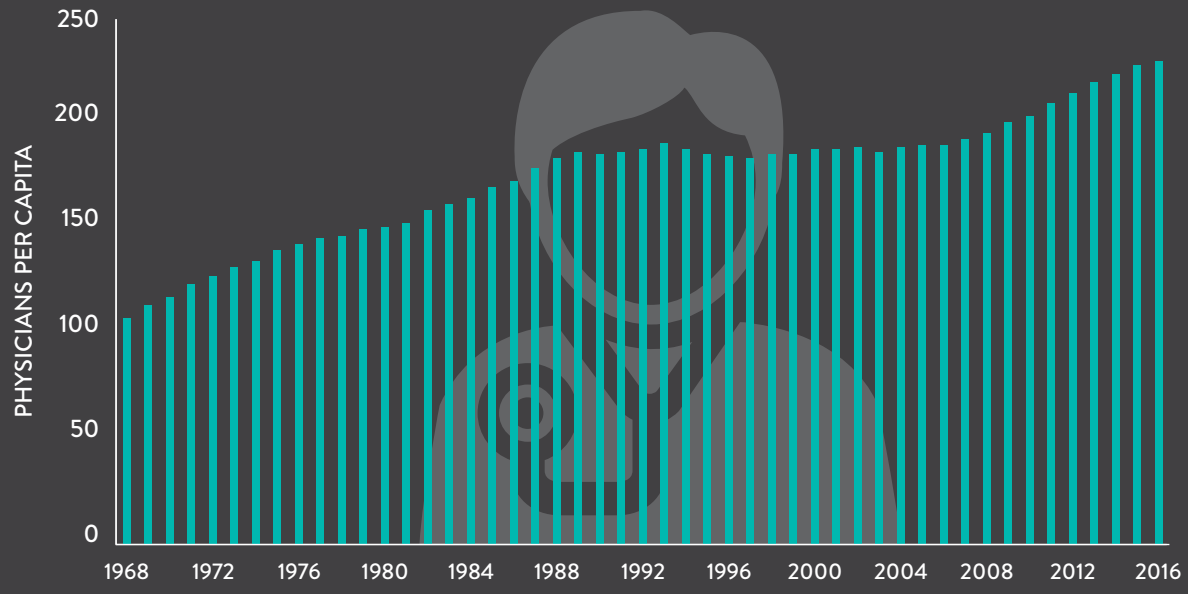
DEMOGRAPHICS

PHYSICIAN SUPPLY

As of 2019, there were more than 91,000 physicians in Canada covering more than 93 different specialties and subspecialties, with just over half being family physicians and the remainder being medical or surgical specialists (*Canadian Institute for Health Information, 2020)*. Although this number was increasing by more than 4% each year, this has since slowed to a 1.8% increase in 2019 (see Figure 4, *Canadian Institute for Health Information, 2017*).

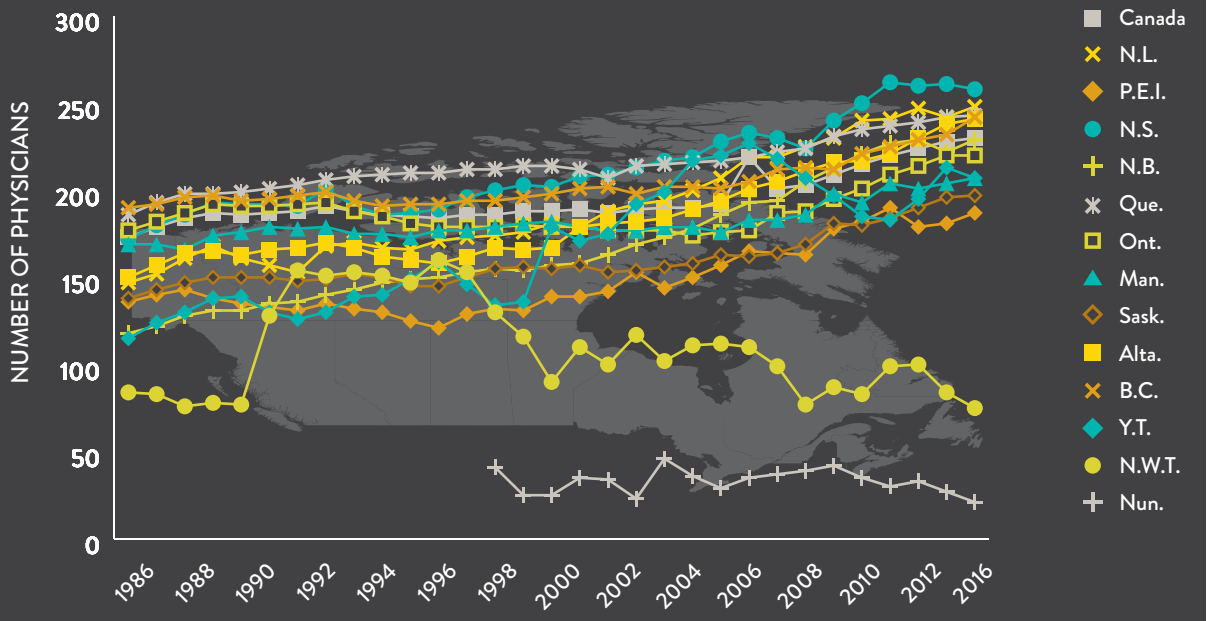
By province, the number of physicians per capita varies dramatically, from 42 physicians per 100,000 people in Nunavut up to 250 per 100,000 people in Nova Scotia (see Figure 5, Canadian Institute for Health Information, 2017).

Figure 4: Physicians per capita in Canada, 1968–2016



Source: Canadian Institute of Health Information, 2017

Figure 5: Physicans per 100,000 population by jurisdiction, 1986–2016

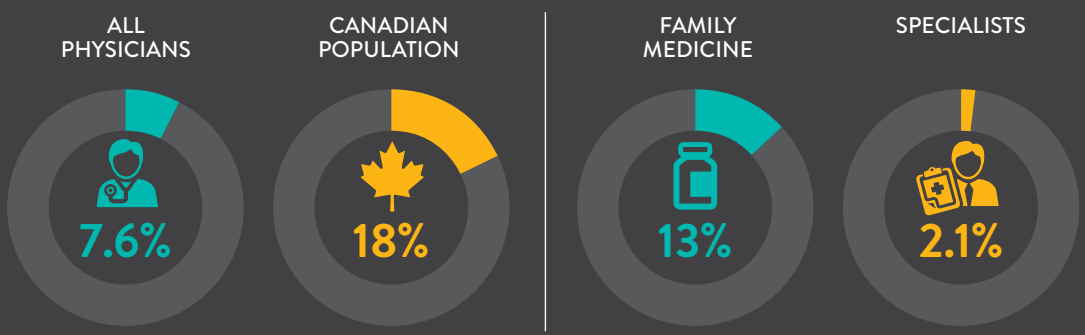


Source: Canadian Institute of Health Information, 2017

PHYSICIAN DISTRIBUTION BY REGION

Although 18% of Canada's population lives in rural areas, only 7.6% of physicians practiced in these areas in 2019 (see Figure 6, Canadian Institute of Health Information, 2020). A higher proportion of family physicians than specialists are located in rural Canada, 13% versus 2.1% in 2019 (Canadian Institute for Health Information 2020). As noted by Geoff Ballinger, Manager of Health Human Resources at the Canadian Institute for Health Information (CIHI), "Many regions have implemented programs to persuade new graduates to work in rural areas. These initiatives encourage doctors to practice in communities where physician access would otherwise be difficult." The effectiveness of these programs has not yet been evaluated, however.

Figure 6: Percentage of rural physicians: Comparison of physicians and Canadian population, 2019



Source: Canadian Institute of Health Information, 2020

PHYSICIAN DISTRIBUTION BY SPECIALTY

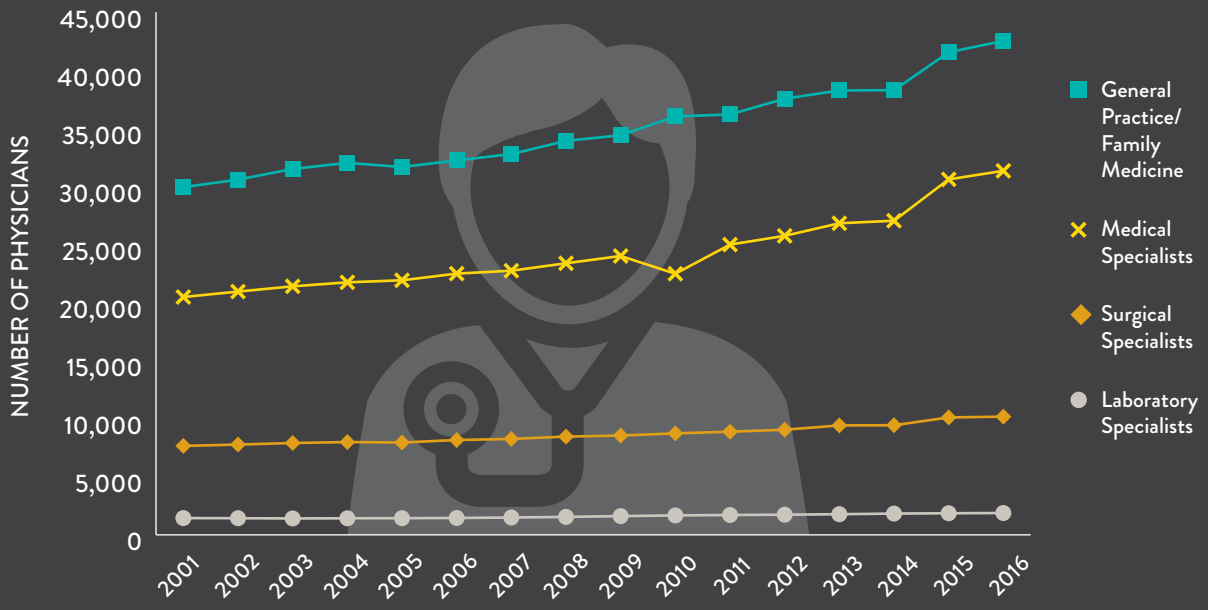
The split of family physicians/general practitioners and medical/surgical specialists has remained relatively stable at roughly 50% since the late 1970s (Canadian Institute for Health Information, 2020). Medical specialties have seen more growth than surgical or laboratory specialties (see Figure 7, Canadian Institute for Health Information, 2017).

PHYSICIAN DISTRIBUTION BY GENDER

An important demographic shift in the physician workforce is the growing number of women in nearly all specialties (see Figure 8, *Canadian Institute of Health Information, 2017).* In 2019, 47.5% of family medicine physicians and 38.0% of specialist physicians in Canada were women. In general, the number of women physicians in the workforce has increased by 19.2% since 2015, surpassing the 5.8% increase for men in the profession. The province of Quebec has the highest proportion of female physicians, just over half.

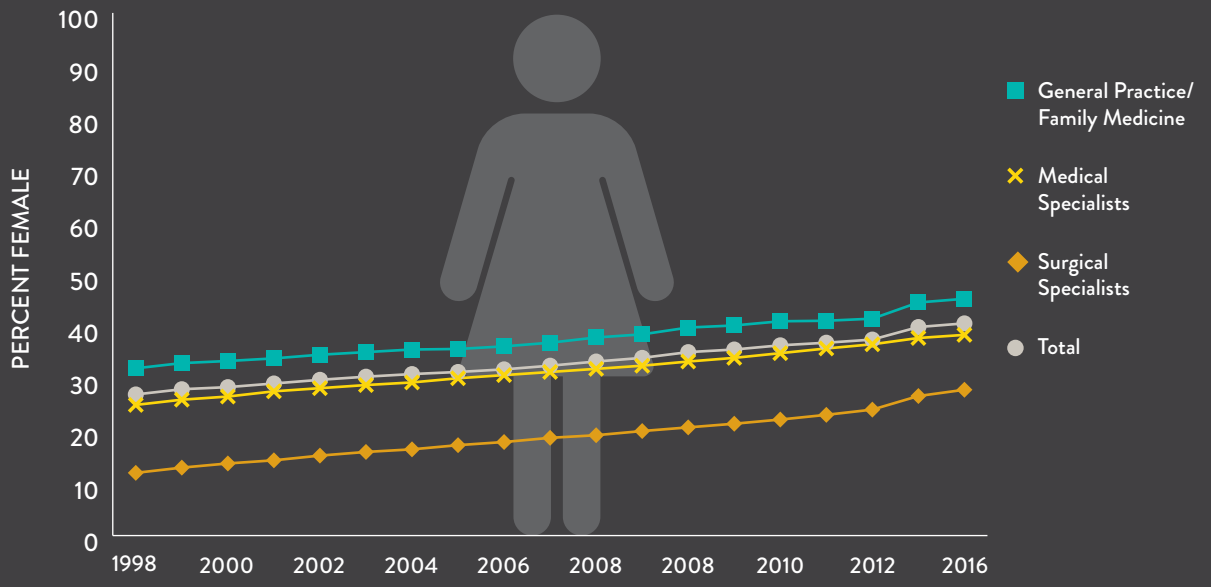
The increase in women in the profession reflects trends in medical education (see Figure 9, Association of Faculties of Medicine of Canada, 2019)

Figure 7: Number of physicians by specialty, 2001–2016



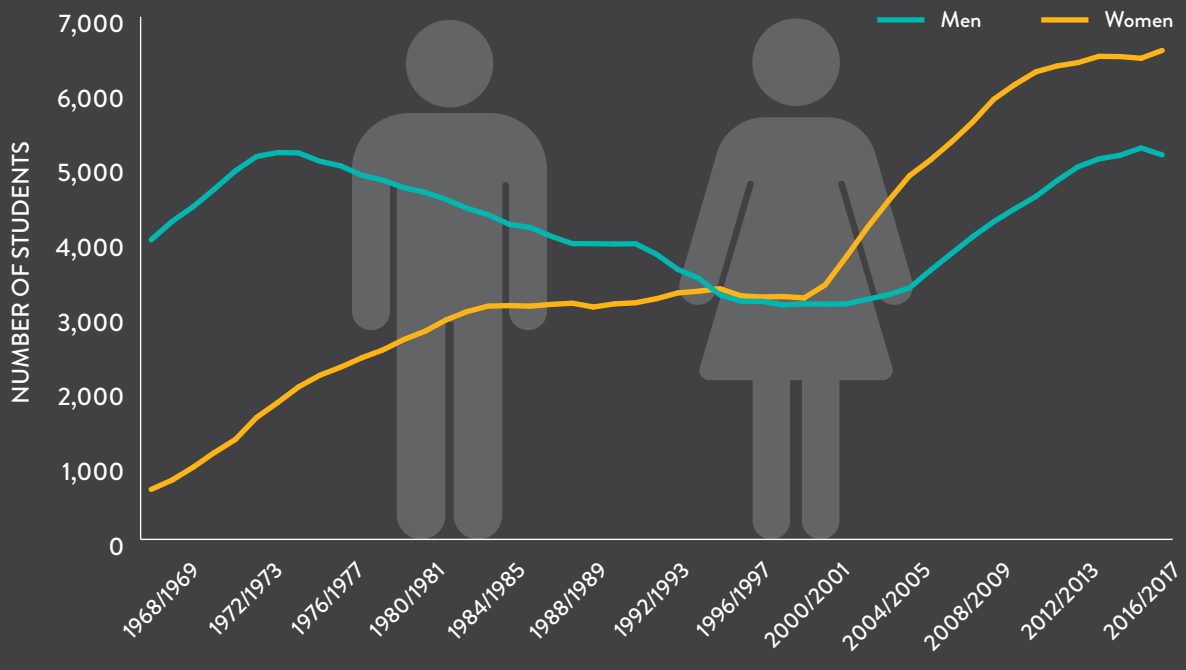
Source: Canadian Institute of Health Information, 2017

Figure 8: Percentage of women by specialty, 1998–2016



Source: Canadian Institute of Health Information, 2017

Figure 9: Enrollment in Canadian medical schools by gender, 1968–2017



Source: Association of Faculties of Medicine of Canada, 2019

PHYSICIAN SUPPLY: FROM SURPLUS TO SHORTAGE AND BACK AGAIN?

In the early 1990s, policymakers were concerned that Canada had a surplus of physicians, as the growth in the physician population was outstripping that of the general population. The Barer-Stoddart report was commissioned to synthesize the views of a variety of national stakeholders and to propose strategies for stabilizing the physician-to-population ratio *(Barer & Stoddart, 1991)*. The report made a series of 53 integrated recommendations, one of which was to cut medical school admissions by 10%, a recommendation that was made with the support of the CMA and the Canadian Association of Interns and Residents.

A few years later, claims of drastic shortages emerged—and Barer and Stoddart were vilified for their suggestion that medical school enrollments be cut. What happened during the 1990s that caused the perception of surplus to flip to shortage so suddenly?

Between 1993 and 2000, the physician-to-population ratio declined 5.1%, returning to 1987 levels *(Chan, 2002)*. In 1993, the two-year family medicine residency, which eliminated the one-year rotating internship, delayed the entry of an entire cohort of family physicians *(Chan, 2002; Evans & McGrail, 2008)*. At the same time, the Université de Montréal shortened undergraduate training, which also eliminated a full class of physicians *(Evans & McGrail, 2008)*. New restrictions were placed on international medical graduates (IMGs), which limited the immigration of new physicians *(Bourgeault & Grignon, 2013; Chan, 2002; Evans & McGrail, 2008)*. Lastly, retirement incentives and mandatory retirements encouraged—or forced—many older physicians out of practice *(Chan, 2002)*.

All things considered, the 10% cut in medical school admission recommended by the Barer-Stoddart report accounted for only 11% of the decline in the physician-to-population ratio *(Chan, 2002)*.

Starting in the early 2000s, new policies were enacted to increase physician supply. In particular, medical schools across the country increased enrollments *(Buske, 2001; Kent, 2000; Pinker, 2000; Square, 2001; Sullivan, 2001)*. Also, licensing requirements for IMGs were eased *(Basky, 2001; Spurgeon, 2000)*. Increases in supply have continued, unabated, since then, resulting in specialty-specific surpluses as well as dramatic increases in total and per-physician expenditures *(Evans & McGrail, 2008)*.

PHYSICIAN DISTRIBUTION BY AGE

The average age of Canada's physicians has declined slightly from 50.0 years in 2015 to 49.4 years in 2019 (Canadian Institute for Health Information, 2020). There is some variation across the country, with average ages ranging from 48.1 in Alberta and Labrador to 52.1 in Prince Edward Island. In general, specialists are slightly older than family physicians, with average ages of 50.8 and 50.1, respectively.

INCOME

In 2018-2019, the annual average gross clinical payments for services delivered by physicians and surgeons in Canada—representing the majority of physician salaries—was $347,000 per physician, a 3.4% increase from 2014-15 (*Canadian Institute for Health Information, 2020*).

Physician incomes vary dramatically depending on the physician's province of residence and by specialty. Physicians' practising in Nova Scotia have the lowest average clinical payments, while physicians in PEI have the highest. Surgical specialists have the highest annual salaries and family medicine physicians have the lowest annual salaries (*Canadian Institute for Health Information, 2020*).

PAYMENTS

For much of their history in Canada, physicians have been paid using fee-for-service remuneration, where they provide a particular service to a particular patient for a set fee. Fees are determined largely by negotiations between provincial professional medical associations and ministries of health. Over the last couple of decades, however, an increasing number of physicians have been choosing alternative forms of payment for some or all of their income. Alternative forms of payment include salary (with and without performance incentives), capitation (annual fees for treating a defined roster of patients) or blended remuneration. Alternative payments have grown and now account for almost 28% of total clinical payments (*Canadian Institute for Health Information, 2017*). Like salaries, the uptake of alternative payments varies considerably by province, being as high as 47% in Nova Scotia and as low as 14% in Alberta (*Canadian Institute for Health Information, 2017*).

SCOPES OF PRACTICE

A physician's scope of practice defines the "procedures, actions, and processes that are permitted for the licensed individual, as laid out by provincial licensing boards" (Royal College of Physicians and Surgeons of Canada, 2013). Each province and territory has a defined scope of practice statement that covers all practising physicians in that province. Additionally, hospitals and health regions/health authorities define explicit practice privileges for physicians practising within their institutions. Because the different specialties create variability in the roles of physicians, these statements are not itemized lists of what a physician is permitted to do but are rather descriptive and lay out what physicians do, helping the public and other health professionals understand physicians' scope of practice. For example, the following is the scope of practice statement for Physicians and Surgeons in British Columbia (Health Professions Council & British Columbia Ministry of Health, 1998):

> *The practice of medicine is the assessment of the physical or mental condition of an individual or group of individuals at any stage of the biological life cycle; the prevention and treatment of physical and mental disease, disorder and condition; and the promotion of good health.*

EVOLUTION OF PHYSICIANS' SCOPES OF PRACTICE

Physicians' scopes of practice have evolved over time and now frequently overlap with those of other medical professions. In Ontario, for example, pharmacists can now perform vaccinations and paramedics can provide home care for seniors; in Manitoba, nurses can order diagnostic testing. Also, the scope of practice for family medicine has expanded into some specialty areas due to the availability of the Special Interest or Focus Practice program, which allows family physicians to gain credentials in one of several clinical areas (*Royal College of Physicians and Surgeons of Canada, 2013*):

- Addiction Medicine;
- Family Practice Anesthesia;
- Cancer Care;
- Child and Adolescent Health;
- Chronic Pain;
- Dermatology;
- Developmental Disabilities;
- Emergency Medicine;

- Enhanced Skills Surgery;
- Global Health;
- Health Care of the Elderly;
- Hospital Medicine;
- Maternity and Newborn Care;
- Mental Health;
- Occupational Medicine;
- Palliative Care;
- Prison Health;
- Respiratory Medicine; and
- Sport and Exercise Medicine

REGULATION AND STANDARDS

The physician profession in Canada is self-regulating. Within each province, a College of Physicians and Surgeons acts as a medical regulatory authority (MRA) that is responsible for the licensure and registration of physicians, and ensures all members are qualified and competent practitioners who follow defined standards. Guided by provincial health professions Acts (see Table 2), MRAs rely on assessment processes to ensure that each physician has the necessary knowledge, skills and professional behaviours necessary for safe practice *(Walsh et al., 2011)*. The MRAs also handle patient complaints and any disciplinary action that may be required.

All physicians must hold a valid licence through their province's College to legally practice. Oversight is also provided by provincial ministries of health, which have the authority to oversee physician performance and quality of care.

TABLE 2: Provincial regulatory bodies and legislative framework

Jurisdiction	Provincial MRA	Legislative and Regulatory Framework
British Columbia	College of Physicians and Surgeons of British Columbia	*Health Professions Act*
Alberta	College of Physicians and Surgeons of Alberta	*Health Professions Act, 1999*
Saskatchewan	College of Physicians and Surgeons of Saskatchewan	*The Medical Professions Act*
Manitoba	College of Physicians and Surgeons of Manitoba	*The Regulated Health Professions Act*
Ontario	College of Physicians and Surgeons of Ontario	*The Regulated Health Professions Act, 1991* *The Medical Act, 1991*
Quebec	Collège des médecins du Québec	Chapter C-26, Quebec Professional Code
New Brunswick	College of Physicians and Surgeons of New Brunswick	*The Medical Act*
Nova Scotia	College of Physicians and Surgeons of Nova Scotia	*The Medial Act*
Prince Edward Island	College of Physicians and Surgeons of Prince Edward Island	*The Regulated Health Professions Act*
Newfoundland and Labrador	College of Physicians and Surgeons of Newfoundland and Labrador	*Health Professions Act*
Yukon	Yukon Medical Council	*Medical Profession Act*
Northwest Territories	Health and Social Services	*Medical Profession Act*
Nunavut	Department of Health and Social Services	*Medical Profession Act*

In response to the Agreement on Internal Trade, which enables unrestricted mobility for health professionals between provinces, there is currently a movement toward the coordination of provincial licences *(Silversides, 2009)*. The Federation of Medical Regulatory Authorities of Canada has developed an agreement establishing a Canadian standard for licensure in all jurisdictions. The Canadian standard for full licensure includes a medical degree from an approved institution, licensure with the Medical Council of Canada, satisfactory completion of approved post-graduate training, and certification from the RCPSC or CFPC.

TOPICAL ISSUES IN MEDICINE

CANADIANS STUDYING ABROAD

Because admission into Canadian medical schools is so competitive, many unsuccessful applicants are now seeking medical training outside of Canada; most (77%) Canadians studying abroad (CSAs) are those who applied to but did not secure entry into Canadian medical programs *(Canadian Resident Matching Service, 2010)*. The majority are also residents of the provinces where medical school application success rates are the lowest: British Columbia and Ontario *(Canadian Resident Matching Service, 2010)*.

According to CaRMS, more than 3,600 Canadians are currently studying medicine in 130 schools across 30 countries *(Canadian Resident Matching Service, 2014a)*—enough to fill at least six Canadian medical schools *(Born & Dhalla, 2011)*. These numbers have rapidly increased since 2000 *(Canadian Resident Matching Service, 2014a; Shepperd, 2011; Walsh et al., 2011)*, with some of these schools now specifically targeting Canadians *(University of St. Andrews, n.d.)*.

The cost of medical training is significantly higher for CSAs than for students at Canadian medical schools (see Table 3), with yearly tuition as high as $63,000 (at the Royal College of Surgeons in Ireland). Debt loads upon completion are also much higher for CSAs: median debt for CSAs in 2010 was $160,000 (mode = $200,000) compared to $71,000 for graduates of Canadian universities *(Canadian Resident Matching Service, 2010)*.

TABLE 3: Costs of studying medicine abroad, 2010

Region	Average Yearly Tuition ($CAD) in 2010	Median Debt Upon Completion
Ireland	$49,800	$200,000
Caribbean	$25,608	$175,000
Australia	$42,334	$200,000
Middle East	$26,336	$90,000
Poland	$14,191	$70,000
Canada	$12,214	$71,000

Ninety percent of students who leave Canada to study medicine intend to return for post-graduate training *(Canadian Resident Matching Service, 2014a)*; however, the road to medical practice is far from certain. CSAs compete with other IMGs for the less than 13% of the total residency slots allocated to IMGs *(British Columbia Ministry of Health, Education & Medicine, 2011)*. They are also required to complete the same MCCEE examination.

Opportunities for post-graduate training in the countries where CSAs complete their medical degrees are also limited. For example, no school in the Caribbean has post-graduate training for international students, while European and Australian schools have very few spaces available *(Canadian Resident Matching Service, 2010)*.

There are arguments for giving CSAs preferential access, primarily because they are Canadian citizens; however, this contravenes the *Canadian Charter of Rights and Freedoms* (*British Columbia Ministry of Health, Education & Medicine, 2011*). Despite this, some evidence suggests that CSAs do currently enjoy a preferential advantage over other IMGs; in particular, their match rates for post-graduate training are higher and they fill more than half of the available first-year residency slots allocated to IMGs, despite making up only 25% of the applicant pool (*Milne, Doig & Dhalla, 2014; Thomson & Cohl, 2011*). That said, this trend may be explained by differences between the CSA and other IMG pools—for example, language proficiency or clinical assessment scores, both of which are taken into account during the resident selection process.

CSAs and their families are frequently unaware of the difficulties they may face in accessing post-graduate training in Canada or abroad (*Barer, Evans & Hedden, 2014; British Columbia Ministry of Health, Education & Medicine, 2011; Milne et al., 2014*). Based on frequent media attention, many assume that Canada is facing a physician shortage and that they will have no difficulty in returning to Canada for post-graduate training (*Milne et al., 2014*). A recent editorial on CSAs notes that "policy makers in both government and medicine should be crystal clear about the prospects for foreign-trained Canadian physicians expecting to return to Canada to practice. Anything less seems irresponsible and invites understandable backlash from disillusioned students and their families" (*Barer et al., 2014*).

PHYSICIAN BURNOUT

Burnout, a well-documented mental state that includes feelings of emotional exhaustion, low personal accomplishment and depersonalization (*Jackson, 1981*), is common among physicians. Physicians and surgeons have highly demanding, stressful careers. Patient emergencies, night calls and demanding patients are factors associated with elevated stress levels among physicians, which can lead to burnout (*Leiter, Frank & Matheson, 2009*). Burnout occurs when physicians feel that their emotional capacity has been depleted due to the stresses and demands of their profession (*Jackson, 1981*) and can lead to lower job satisfaction (*Balch, Shanafelt, Sloan, Satele & Freischlag, 2011; Ozyurt, Hayran & Sur, 2006; Weng et al., 2011*) and decreased mental health (*Asai et al., 2007; Shanafelt et al., 2011*). This then leads to decreased productivity (*Dewa, Loong, Bonato, Thanh & Jacobs, 2014*) and reduces the time spent on—as well as the quality of—patient care (*Klein, Grosse Frie, Blum & von dem Knesebeck, 2010; Shanafelt et al., 2010*). Burnout hinders physicians' ability to provide quality care to patients and threatens both the sustainability of the physician workforce and the efficacy of the health system as a whole.

The prevalence of burnout

Burnout across all physician specialties has been documented both internationally and domestically. In 2003, a Canadian Medical Association Physician Resource Questionnaire found that 46% of Canadian physicians suffer from burnout (*Boudreau, Cahoon & Wedel, n.d.*); a similar study in 2009 found that 48% of physicians experienced emotional exhaustion and 46% experienced depersonalization (*Leiter et al., 2009*). In the United States, a recent survey indicated that 46% of physicians were experiencing burnout (*Shanafelt et al., 2012*), while in Europe 43% of physicians scored high for emotional exhaustion, 35% for depersonalization and 32% for low personal accomplishments (*Soler et al., 2008*).

Burnout levels appear to be stable over time in physicians and higher than levels observed in other professions (*Stability, 2011*); for example, a Statistics Canada study found that 17% to 32% of employed Canadians felt stress from work and life (*Shields, 2006*).

The effects of burnout

Physician burnout affects not just physicians but also patients and populations. At the physician level, burnout has adverse effects on mental and physical health (*Asai et al., 2007; Melamed, Kushnir & Shirom, 1992; Shanafelt et al., 2011*), which can cause physicians to reduce office hours or leave the profession entirely (*Grunfeld et al., 2000*). Patients treated by physicians experiencing burnout are less satisfied and experience more medical errors (*Klein et al., 2010; Shanafelt et al., 2010*). At the population level, the economic impact of physician burnout has been estimated at $213.1 million as a result of early retirement and reduced clinical hours (*Dewa, Jacobs, Thanh & Loong, 2014*).

To address these demonstrably negative and significant impacts on both physicians and patients, it will be important for policymakers, health authorities, clinics and individual physicians to work together to mitigate the effects of work stress on physicians by instituting policies and/or stress-coping strategies. Building resilience to stress is an important mechanism to prevent burnout, with one Canadian study showing that physicians who had positive attitudes and perspectives, balance and prioritization, a healthy work environment, and healthy relationships were less affected by the stress of the profession and therefore less likely to experience burnout *(Jensen, Trollope-kumar, Waters & Everson, 2008)*. Canada's health system should be built on policies that help physicians maintain a healthy work-life balance and engage in continuing education opportunities, which have been found to help reduce stress and decrease burnout *(Lee & Brown, 2008)*.

CONCLUSION

The second-largest health-care workforce in Canada, the physician profession has a long and complex history in this country, and has been the dominant health profession since the early- to mid-1800s. Some argue that this dominance has waned since the 1960s, with increases in professional autonomy for several other health professions and the introduction of public health insurance covering physician services.

The workforce has become increasingly specialized since its inception: two specialties (general medicine and general surgery) have been replaced with 79 distinct medical disciplines, each of which are trained and practice differently.

Education for physicians is a long and demanding process that includes a minimum seven (but usually eight) years of post-secondary education, two to six years of post-graduate residency training, and multiple examinations along the way. Internationally trained graduates also face additional hurdles.

Some 3,600 Canadians currently study medicine abroad, with 90% of these hoping to return to Canada for post-graduate training; however, residency opportunities for these students are few. Policy makers have a responsibility to make prospects crystal clear for foreign-trained Canadian physicians so that they are aware of the risks associated with training abroad.

Medical education and post-graduate training is accredited by the RCPSC (for all specialties other than family medicine) and the CFPC (for family medicine). Both organizations use a competency-based framework to set educational standards for post-graduate residency programs, accreditation, resident assessment, examinations and maintenance of competency.

The physician workforce is plagued by supply issues that wax and wane between perceptions of surplus to perceptions of shortage. Current issues facing the workforce include underemployment in some specialties. Distribution issues are particularly evident with shortages in rural and remote communities, and in particular among Indigenous populations.

ACRONYMS

CanMEDS-FM	CanMEDS-Family Medicine
CaRMS	Canadian Resident Matching Service
CFPC	College of Family Physicians Canada
CIHI	Canadian Institute for Health Information
CMA	Canadian Medical Association
CSA	Canadian studying abroad
IMG	International medical graduate
MAINPRO	Maintenance of Proficiency
MCAT	Medical College Admission Test
MCC	Medical Council of Canada
MCCEE	Medical Council of Canada Evaluating Examination
MCCQE	Medical Council of Canada's Qualifying Examination
MD	Doctor of Medicine
MOC	Maintenance of Certification
MRA	Medical regulatory authority
NAC	National Assessment Collaboration Exam
RCPSC	Royal College of Physicians and Surgeons of Canada

BIBLIOGRAPHY

Alford, R.R. (1977). *Health care politics: Ideological and interest group barriers to reform*. University of Chicago Press. Retrieved from http://books.google.ca/books/about/Health_care_politics.html?id=k_rKQ14YxDAC&pgis=1.

American Association of Medical Colleges. (2013). *Graduation Questionnaire 2013: All schools summary report*.

Asai, M., Morita, T., Akechi, T., Sugawara, Y., Fujimori, M., & Akizuki, N. (2007). *Burnout and psychiatric morbidity among physicians engaged in end-of-life care for cancer patients: A cross-sectional nationwide survey in Japan, 428* (August 2006), 421–428. doi:10.1002/pon.

Association of Faculties of Medicine of Canada. (2013). *Enrollment in Canadian faculties of medicine by sex*.

Association of Faculties of Medicine of Canada. (2019). *Canadian medical education statistics*. Retrieved from http://www.afmc.ca/publications-statistics-e.php.

Association of Faculties of Medicine of Canada. (2014). *DataPoint! International medical graduates and Canadians studying medicine abroad*.

Association of Faculties of Medicine of Canada (2019) *Canadian Medical Education Statistics Report*. Retrieved from https://afmc.ca/sites/default/files/pdf/CMES/CMES2019-Complete_EN.pdf

Audas, R., Ryan, A., & Vardy, D. (2009). Where did the doctors go? A study of retention and migration of provisionally licensed international medical graduates practising in Newfoundland and Labrador between 1995 and 2006. *Canadian Journal of Rural Medicine, 14*(1), 21–24. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/19146788.

Balch, C.M., Shanafelt, T.D., Sloan, J.A., Satele, D.V., & Freischlag, J.A. (2011). Distress and career satisfaction among 14 surgical specialties, comparing academic and private practice settings. *Annals of Surgery, 254*(4), 558–568. doi:10.1097/SLA.0b013e318230097e

Barer, M.L., Evans, R.G., & Hedden, L. (2014). False hope for *Canadians who study medicine abroad. Canadian Medical Association Journal, 186*(7), 552. doi:10.1503/cmaj.131704.

Barer, M.L., & Stoddart, G.L. (1991). *Toward integrated medical resource policies for Canada. Report prepared for the Federal/Provincial/Territorial Conference of Deputy Ministers of Health*. Retrieved from http://scholar.google.ca/scholar?q=Toward+integrated+medical+resource+policies+for+Canada&btnG=&hl=en&as_sdt=0,5#9.

Basky, G. (2001). Saskatchewan hopes to ease MD shortage by easing licensing requirements. *Canadian Medical Association Journal, 164*(9), 1336. Retrieved from http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=81042&tool=pmcentrez&rendertype=abstract.

Born, K., & Dhalla, I.A. (2011). *Why are so many Canadians going abroad to study medicine?* Retrieved from http://healthydebate.ca/2011/03/topic/politics-of-health-care/why-are-so-many-canadians-going-abroad-to-study-medicine.

Boudreau, R.A., Cahoon, S. L., & Wedel, R.J. (n.d.). The pandemic from within: Two surveys of physician burnout in Canada. *Canadian Journal of Community Mental Health, 25*(2), 71–88.

Bourgeault, I.L., & Grignon, M. (2013). A comparison of the regulation of health professional boundaries across OECD countries. *European Journal of Comparative Economics, 10*(2), 199–223. Retrieved from http://ideas.repec.org/a/liu/liucej/v10y2013i2p199-223.html.

British Columbia Ministry of Health, Education & Medicine (2011). *International Medical Graduate Program (IMG-BC) challenges facing Canadians studying abroad*.

Buske, L. (2001). Medical school enrolment rebounds. *Canadian Medical Association Journal, 165*(11), 1526a. Retrieved from http://www.cmaj.ca/content/165/11/1526.2.short?related-urls=yes&legid=cmaj;165/11/1526-a.

Canadian Collaborative Centre for Physician Resources. (2013). *Canadian physician resources: 2013 basic facts*. Retrieved from https://www.cma.ca/Assets/assets-library/document/en/advocacy/PhysFacts2013-e.pdf.

Canadian Doctors for Medicare. (2014). *BC court challenge*. Retrieved from http://www.canadiandoctorsformedicare.ca/Issues/bc-court-challenge.html?Itemid=172.

Canadian Foundation for Healthcare Improvement. (2010). *Mythbuster: Most physicians prefer fee-for-service payments*. Retrieved from http://www.cfhi-fcass.ca/SearchResultsNews/10-01-01/13b5e8bb-e7c2-4544-8da5-b1aa5d9e38db.aspx.

Canadian Foundation for Healthcare Improvement. (2013). Myth: International medical graduates are the solution to the doctor shortage in underserviced areas. *Mythbusters*. Retrieved rom http://www.cfhi-fcass.ca/PublicationsAndResources/Mythbusters/ArticleView/2013/05/14/e628dec0-3dd1-4572-999c-456c54ef0f06.aspx.

Canadian Health Workforce Network. (2013). *Internationally educated health professionals: A review of the Canadian literature*. Ottawa, ON: Author.

Canadian Institute for Health Information. (2009). *International medical graduates in Canada: 1972 to 2007 executive summary data sources and methodology data sources*.

Canadian Institute for Health Information. (2017). Supply, distribution and migration of Canadian physicians, 2016 .

Canadian Institute for Health Information (2020) Physicians in Canada, 2019. Ottawa, ON: CIHI Retrieved from: https://www.cihi.ca/sites/default/files/document/physicians-in-canada-report-en.pdf

Canadian Medical Association. (2014a). *History, mission, vision and values*. Retrieved from https://www.cma.ca/En/Pages/history-mission-vision.aspx.

Canadian Medical Association. (2014b). *Number of physicians by province/territory and specialty, Canada, 2014*. Retrieved from https://www.cma.ca/Assets/assets-library/document/en/advocacy/01-physicians-by-Specialty-Province-2014-e.pdf.

Canadian Medical Association. (2015). *Becoming a physician*. Retrieved from http://www.facturation.net/becoming-a-physician.

Canadian Resident Matching Service. (2010). *Canadian students studying medicine abroad*. Retrieved from https://www.carms.ca/pdfs/2010_CSA_Report/CaRMS_2010_CSA_Report.pdf.

Canadian Resident Matching Service. (2012). *R-1 match reports, 2012*. Retrieved from https://www.carms.ca/en/r-1-match-reports-2012.

Canadian Resident Matching Service. (2014a). *Returning to Canada*. Retrieved from https://www.carms.ca/en/returning-to-canada.

Canadian Resident Matching Service. (2014b). *New to Canada*. Retrieved from https://www.carms.ca/en/new-to-canada.

Chan, B. (2002). *From perceived surplus to perceived shortage: What happened to Canada's physician workforce in the 1990s?* Ottawa, ON: Canadian Institute for Health Information. Retrieved from http://secure.cihi.ca/cihiweb/products/chanjun02.pdf.

Chowdhury, M.M., Dagash, H., & Pierro, A. (2007). A systematic review of the impact of volume of surgery and specialization on patient outcome. *The British Journal of Surgery, 94*(2), 145–61. doi:10.1002/bjs.5714

Coburn, D., Torrence, G.M., & Kaufert, J.M. (1983). Medical dominance in Canada in historical perspective: The rise and fall of medicine? *International Journal of Health Services, 13*(3), 407–432.

College of Family Physicians of Canada. (2013). *Specific standards for family physician medicine residency programs accredited by the College of Family Physicians of Canada: The Red Book*.

Deber, R. (1998). The Public Private Mix in Health Care. In *Striking a Balance: Health Care Systems in Canada and Elsewhere* (p. 433).

Dewa, C.S., Jacobs, P., Thanh, N.X., & Loong, D. (2014). An estimate of the cost of burnout on early retirement and reduction in clinical hours of practicing physicians in Canada. *BMC Health Services Research, 14*(1), 254. doi:10.1186/1472-6963-14-254

Dewa, C.S., Loong, D., Bonato, S., Thanh, N.X., & Jacobs, P. (2014). How does burnout affect physician productivity? A systematic literature review. *BMC Health Services Research, 14*(1), 325. doi:10.1186/1472-6963-14-325

Dove, N. (2009). Can international medical graduates help solve Canada's shortage of rural physicians? *Canadian Journal of Rural Medicine, 14*(3), 120–123. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/19594998.

Evans, R.G., & McGrail, K. (2008). Richard III, Barer-Stoddart and the Daughter of Time. *Healthcare Policy, 3*(3), 18–28. Retrieved from https://www.longwoods.com/content/19564.

Evans, R.G., Barer, M.L., & Hedden, L. (2014). Two wings and a prayer: Should Canada make it easier for Canadian doctors trained abroad to enter practice here? *Healthcare Policy, 9*(4). Retrieved from http://www.longwoods.com/content/23817.

Flood, C. (2006). Chaoulli's legacy for the future of Canadian health care policy. *Osgoode Hall LJ*. Retrieved from http://heinonlinebackup.com/hol-cgi-bin/get_pdf.cgi?handle=hein.journals/ohlj44&section=22.

Frank, J.R., & Danoff, D. (2007). The CanMEDS initiative: Implementing an outcomes-based framework of physician competencies. *Medical Teacher, 29*(7), 642–7. doi:10.1080/01421590701746983.

Gidney, R.D., & Millar, W.P. (1982). *The origins of organized medicine in Ontario, 1850–1869*. London, ON: University of Western Ontario.

Goldbloom, R.B. (1978). Increasing specialization in medicine. *Canadian Medical Association Journal, 118*(11), 1347–1348. Retrieved from http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1818407&tool=pmcentrez&rendertype=abstract.

Gosden, T. (1999). How should we pay doctors? A systematic review of salary payments and their effect on doctor behaviour. *QJM: Monthly Journal of the Association of Physicians, 92*(1), 47–55. doi:10.1093/qjmed/92.1.47

Gosden, T., Forland, F., Kristiansen, I.S., Sutton, M., Leese, B., Giuffrida, A., … Pedersen, L. (2000). Capitation, salary, fee-for-service and mixed systems of payment: Effects on the behaviour of primary care physicians. *Cochrane Database of Systematic Reviews, 3*(3). Retrieved from http://www.hpm.org/Downloads/Bellagio/Articles/Capitation__salary__fee-for-service_CochrReview.pdf.

Government of Canada, & Social Development Canada Strategic Monitoring and Reporting. (2006). *Canadians in context – Population size and growth/indicators of well-being in Canada*. Retrieved from http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=35.

Grunfeld, E., Whelan, T.J., Zitzelsberger, L., Willan, A.R., Montesanto, B., & Evans, W.K. (2000). Cancer care workers in Ontario: Prevalence of burnout, job stress and job satisfaction. *Canadian Medical Association Journal, 163*(2), 166–9.

Hall, E.M. (1980). *Canada's national-provincial health program for the 1980s: A commitment for renewal*.

Health Canada – Strategic Policy Branch. (2011). *Canada's health care system*. Retrieved from http://www.hc-sc.gc.ca/hcs-sss/pubs/system-regime/2011-hcs-sss/index-eng.php#a13.

Health Professions Council & British Columbia Ministry of Health. (1998). *Physicians and surgeons scope of practice review (preliminary report)*. Retrieved from http://www.health.gov.bc.ca/professional-regulation/hpc/review/part-i/scope-physicians.html.

Indigenous Physicians Aassociation of Canada & the Association of Faculties of Medicine of Canada. (2009). *First Nations, Inuit, Métis health core competencies: A currriculm framework for undergraduate medical educatoin*. doi:10.1093/carcin/bgu172.

Jackson, S.E. (1981). The measurement of experienced burnout. *Journal of Occupational Behaviour, 2*(99–113).

Jensen, P.M., Trollope-Kumar, K., Waters, H., & Everson, J. (2008). Building physician resilience. *Canadian Family Physician, 54*, 722–729.

Kent, H. (2000). Medical school enrolment to increase at UBC. *Canadian Medical Association Journal, 163*(6), 753a. Retrieved from http://www.cmaj.ca/content/163/6/753.2.full.

Klein, J., Grosse Frie, K., Blum, K., & von dem Knesebeck, O. (2010). Burnout and perceived quality of care among German clinicians in surgery. *International Journal for Quality in Health Care, 22*(6), 525–530. doi:10.1093/intqhc/mzq056.

Lee, F.J., & Brown, J.B. (2008). Stress, burnout, and strategies for reducing them. *Canadian Family Physician, 54*, 234–235.

Leiter, M.P., Frank, E., & Matheson, T.J. (2009). Demands, values, and burnout. *Canadian Family Physician, 55*, 1224–1225.

Marchildon, G.P. (n.d.). *The Encyclopedia of Saskatchewan – Doctors' Strike*. Retrieved from http://esask.uregina.ca/entry/doctors_strike.html.

Mathews, M., Edwards, A.C., & Rourke, J.T.B. (2008). Retention of provisionally licensed international medical graduates: A historical cohort study of general and family physicians in Newfoundland and Labrador. *Open Medicine, 2*(2).

McKay, T.W.G. (1925). *Regulations under the Drugless Practitioners Act 1925, C.49*. Toronto, ON. Retrieved from http://search.library.utoronto.ca/details?1944898&uuid=92b02ae5-965c-41ce-a48e-25678fc8c27f.

Medical Council of Canada. (2014a). *Our story*. Retrieved from http://mcc.ca/about/story/.

Medical Council of Canada. (2014b). *Medical Council of Canada Qualifying Examination Part I*. Retrieved from http://mcc.ca/examinations/mccqe-part-i/.

Melamed, S., Kushnir, T., & Shirom, A. (1992). Burnout and risk factors for cardiovascular diseases. *Behavioral Medicine (Washington, D.C.), 18*(2), 53–60. doi:10.1080/08964289.1992.9935172

Milne, V., Doig, C., & Dhalla, I.A. (2014). *Changes ahead for international medical graduates coming to Canada*. Retrieved from http://healthydebate.ca/2014/06/topic/international-medical-graduates-canada.

Morrison, S. (2008). *McMaster addressing health of Aboriginal Peoples, enrolment in medical school*. Retrieved from http://fhs.mcmaster.ca/main/news/news_2008/aboriginal_doctors.html.

Naylor, D. (1986). *Private practice, public payment: Canadian medicine and the politics of health insurance, 1911–1966*. McGill-Queen's Press. Retrieved from http://books.google.ca/books/about/Private_Practice_Public_Payment.html?id=bQMOlHDF4BUC&pgis=1.

Ontario Universities' Application Centre. (2014). *Medical school application statistics*. Retrieved from http://www.ouac.on.ca/statistics/med_app_stats/.

Ozyurt, A., Hayran, O., & Sur, H. (2006). Predictors of burnout and job satisfaction among Turkish physicians. *QJM: Monthly Journal of the Association of Physicians, 99*(3), 161–169. doi:10.1093/qjmed/hcl019.

Pinker, S. (2000). Quebec med schools up enrolment for second year in row. *Canadian Medical Association Journal, 163*(5), 582a. Retrieved from http://www.cmaj.ca/content/163/5/582.2.full.

Royal College of Physicians and Surgeons of Canada. (2005). *CanMEDS 2005 framework*. Retrieved from http://www.royalcollege.ca/portal/page/portal/rc/canmeds/framework#manager.

Royal College of Physicians and Surgeons of Canada. (2013). *2013 Royal College National Specialty Society Human Resources for Health Dialogue and Specialty Medicine Summit: Changing scopes of practice – Discussion paper*.

Royal College of Physicians and Surgeons of Canada. (2014a). *CanMEDS 2015: Evolving the CanMEDS framework*. Retrieved from http://www.royalcollege.ca/portal/page/portal/rc/canmeds/canmeds2015/overview.

Royal College of Physicians and Surgeons of Canada. (2014b). *Our history*. Retrieved from http://www.royalcollege.ca/portal/page/portal/rc/about/history.

Royal College of Physicians and Surgeons of Canada. FAQ: Royal College Indigenous health initiative [Internet]. 2018 [cited 2018 Jul 11]. Available from: http://www.royalcollege.ca/rcsite/health-policy/initiatives/indigenous-health/faq-royal-college-indigenous-health-initiative-e

Saucier, D. (2009). *CanMEDS – Family medicine*.

Shanafelt, T.D., Balch, C.M., Bechamps, G., Russell, T., Dyrbye, L., Satele, D., … Freischlag, J. (2010). Burnout and medical errors among American surgeons. *Annals of Surgery, 251*(6), 995–1000. doi:10.1097/SLA.0b013e3181bfdab3.

Shanafelt, T.D., Balch, C.M., Dyrbye, L., Bechamps, G., Russell, T., Satele, D., … Oreskovich, M.R. (2011). Special report: Suicidal ideation among American surgeons. *Archives of Surgery (Chicago, 1960), 146*(1), 54–62. doi:10.1001/archsurg.2010.292.

Shanafelt, T.D., Boone, S., Tan, L., Dyrbye, L. N., Sotile, W., Satele, D., … Oreskovich, M.R. (2012). Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Archives of Internal Medicine, 172*(18), 1377–1385. doi:10.1001/archinternmed.2012.3199.

Shepperd, M. (2011). Too many Canadians studying medicine overseas. *CBC News*. Retrieved from http://www.cbc.ca/news/health/too-many-canadians-studying-medicine-overseas-1.993980

Shields, M. (2006). Stress and depression in the employee population. *Health Reports, 17*(4), 11–29.

Silversides, A. (2009). Physician mobility remains a "moving target". *Canadian Medical Association Journal, 181*(9), E191–192. doi:10.1503/cmaj.109-3050

Soler, J.K., Yaman, H., Esteva, M., Dobbs, F., Asenova, R.S., Katic, M., … Ungan, M. (2008). Burnout in European family doctors: The EGPRN study. *Family Practice, 25*(4), 245–265. doi:10.1093/fampra/cmn038

Spurgeon, D. (2000). Canada waives examination rules for foreign cancer specialists. *BMJ (Clinical Research Ed.), 321*(7271), 1243. Retrieved from http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1119005&tool=pmcentrez&rendertype=abstract.

Square, D. (2001). Manitoba increases med school enrolment in attempt to fight doctor deficit. *Canadian Medical Association Journal, 164*(3), 395. Retrieved from http://www.cmaj.ca/content/164/3/395.1.full

Stability, H.J. (2011). Stability and change in burnout: A 10-year follow-up study among primary care physicians. *Journal of Occupational and Organizational Psychology, 84*(2), 248–267. doi:10.1111/j.2044-8325.2010.02013.x/full

Statistics Canada. (2013). *Health at a Glance: Select health indicators of First Nations people living off reserve, Métis and Inuit*. Retrieved from http://www.statcan.gc.ca/pub/82-624-x/2013001/article/11763-eng.htm.

Sullivan, P. (2001). Medical school enrolment growing too slowly? *Canadian Medical Association Journal, 164*(9), 1334a. Retrieved from http://www.cmaj.ca/content/164/9/1334.2.full.

Sullivan, P. (2012). *Women now outnumber men in family medicine, CMA data show*. Retrieved from http://www.cma.ca/women-outnumber-men-family-medicine.

Thomson, G., & Cohl, K. (2011). *IMG selection: Independent review of access to postgraduate programs by international medical graduates in Ontario – Volume 1: Findings and recommendations*.

Turner, J.G. (1958). The Hospital Insurance and Diagnostic Services Act: Its impact on hospital administration. *Canadian Medical Association Journal, 78*(10), 768–770. Retrieved from http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1829926&tool=pmcentrez&rendertype=abstract.

Tyrrell, M., & Dauphinee, W.D. (1999). *Task Force on Physician Supply in Canada*.

University of St. Andrews. (n.d.). *University of St. Andrews School of Medicine: Alberta Medical Programme*. Retrieved from http://medicine.st-andrews.ac.uk/pro/alberta/.

Vardy, D., Ryan, A.N., & Audas, R. (2008). Provisionally licensed international medical graduates Newfoundland and Labrador. *Our Diverse Cities*, 109–115.

Vogel, L. (2011). Specialty training out-of-sync with job market. *Canadian Medical Association Journal, 183*(13), E1016. doi:10.1503/cmaj.109-3985

Waldram, J.B., Herring, A., & Young, T.K. (2006). *Aboriginal health in Canada: Historical, cultural, and epidemiological perspectives*. University of Toronto Press. Retrieved from http://books.google.com/books?hl=en&lr=&id=O-jBWP_HgT8C&pgis=1.

Walsh, A., Banner, S., Schabort, I., Armson, H., Bowmer, I., & Granata, B. (2011). *International medical graduates – Current issues*.

Weng, H.C., Hung, C.M., Liu, Y.T., Cheng, Y.J., Yen, C.Y., Chang, C.C., & Huang, C.-K. (2011). Associations between emotional intelligence and doctor burnout, job satisfaction and patient satisfaction. *Medical Education, 45*(8), 835–42. doi:10.1111/j.1365-2923.2011.03985.x

World Health Organization. (2008). *Classifying health workers: Mapping occupations to the international standard classification*.