Royal College Medical Workforce Knowledgebase

Methodology Guide

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Data Sources

Residency Quota – Canadian Resident Matching Service

This data series shows the residency quota offered in the Canadian Resident Matching Service (CaRMS) PGY1 and subspecialty match processes (R-1, medicine subspecialty match [MSM], pediatric subspecialty match [PSM], family medicine–emergency medicine match [FMEM]). Figures reflect the quota after reversion during the first iteration and are provided by CaRMS through a custom data request. The series includes the combined number of positions from six different quota types including 1) Graduate of Canadian medical school (CMG) quota; 2) International medical graduate (IMG) quota; 3) Competitive quota; 4) CMG Medical Officer Training Plan (MOTP) quota; 5) Particular quota (QC graduates only); 6) Regular quota (Non-QC graduates). Note that visa trainees are not part of the CaRMS matching process. Also, CaRMS does not have information on certain subspecialty training positions, such as those offered in laboratory and surgical subspecialties.

New Trainees – Canadian Post-M.D. Education Registry

This data series shows the number of all incoming post-M.D. trainees (residents) as they start Canadian residency programs at the specialty (PGY1) and subspecialty levels. Figures are provided by the Canadian Post-M.D. Education Registry (CAPER) through a custom data request. Subspecialty trainees are counted at appropriate training levels corresponding to the first subspecialty year for each discipline. The series includes CMGs as well as IMGs. Trainee counts include Canadian citizens and permanent residents of Canada; visa trainees are excluded.

New Certificants – College of Family Physicians of Canada; Royal College of Physicians and Surgeons of Canada

This data series shows the number of physicians who became newly-certified by the College of Family Physicians of Canada (CFPC) and/or the Royal College of Physicians and Surgeons of Canada (Royal College). The data is sourced from administrative databases of the Royal College and the CFPC. Certificants who are already practising in Canada when they receive their certification are excluded (e.g., practice eligible route). Counts include Canadian citizens, permanent residents as well as non-Canadians who become certified by the Royal College and CFPC. Certification data of the Collège des Médecins du Québec (CMQ) is not directly included in the Medical Workforce Knowledgebase. However, the CMQ confers certification based on Royal College, CFPC and American Board of Family Medicine (ABFM) credentials. Thus, new CMQ certificants are counted through Royal College and CFPC data, with the exception of those who receive CMQ certification by virtue of ABFM certification alone.

Licensed Physician Workforce – [Canadian Institute for Health Information](#)

This data series is based on the Scott's Medical Database from the Canadian Institute for Health Information (CIHI) and includes all active physicians in Canada. CIHI defines active physicians as individuals with an MD degree who have a valid mailing address in Canada. This data series excludes the following: medical residents; military physicians; non-registered physicians who have not given consent to publish their data; physicians on temporary leave or sabbatical; physicians who are abroad; and retired or semi-retired physicians. Figures are based on data from a custom request which includes information on the supply of the licensed physician workforce as well as the age, sex and geographic distribution for the latest data year.

Metrics

Each specialty must have the complete five years of data in order to calculate the metrics and summary statistics. However, if there is less than five years of data in a particular specialty, basic count data is still provided. For disciplines with small numbers (i.e., fewer than five physicians for three out of five data years) counts are shown but summary statistics are not calculated. Small discipline counts are included in subtotals and grand totals as well as their associated summary statistics.

Metric	Definition
Average change (%)	Average of year-over-year percent changes from the five-year data period
Slope (5-year trend line)	Annual rate of change over the time period covered by the series. The trend line is the slope of the regression line, where the data series numbers are y values and years are x values.
Change Metric (Slope)	Identification of the relative directionality for the trend line. Classified as "UP" if slope >0.4 and $r^2 \geq 0.3$. Classified as "DOWN" if slope < -0.4 and $r^2 \geq 0.3$. Disciplines that do not meet the above criteria are labelled as "NO CHANGE"
Physicians less than 35 years of age (%)	Percentage of the workforce that is comprised of younger physicians. Calculated by dividing the number of physicians aged <35 by the total number of physicians
Physicians 65+ years of age (%)	Percentage of the workforce that is comprised of older physicians. Calculated by dividing the number of physicians aged 65+ by the total number of physicians. Note that 65+ is not linked to retirement projections as a number of physicians work well beyond that age.
Relative Age Ratio (RAR)	The relative age ratio is used as a metric for the age distribution of the licensed physician workforce. Calculated by dividing the number of physicians aged <35 by the number of physicians aged 65+
Change Metric (RAR)	Classified as "OLDER" if RAR <1.0. Classified as "YOUNGER" if RAR > 1.0. Disciplines that do not meet the above criteria are labelled as "EQUAL"

Female physicians (%)	Percentage of the workforce that is comprised of female physicians. Calculated by dividing the number of female physicians by the total number of physicians
Male physicians (%)	Percentage of the workforce that is comprised of male physicians. Calculated by dividing the number of male physicians by the total number of physicians

Excluded Specialties

Due to small sample sizes or data availability, the following specialties/ subspecialties are not presented individually but are included within subtotals and the overall total.

- Adolescent Medicine
- Child and Adolescent Psychiatry
- Clinical Pharmacology & Toxicology (Anesthesiology, Emergency Medicine, Internal Medicine, Pediatrics, Psychiatry)
- Colorectal Surgery
- Critical Care Medicine (Anesthesiology, Cardiac Surgery, Emergency Medicine, General Surgery)
- Electroencephalography
- Family Medicine (Care of the Elderly)
- Family Medicine (Enhanced Skills)
- Forensic Pathology (Anatomical Pathology, General Pathology)
- Forensic Psychiatry
- General Surgical Oncology
- Geriatric Psychiatry
- Gynecologic Oncology
- Gynecologic Reproductive Endocrinology & Infertility

- Interventional Radiology
- Laboratory Medicine
- Maternal Fetal Medicine
- Medical scientists
- Neurology (pediatric subspecialty match only)
- Neuropathology
- Neuroradiology
- Occupational Medicine
- Pain Medicine (Anesthesiology)
- Palliative Medicine
- Pediatric Emergency Medicine (Emergency Medicine)
- Pediatric Radiology
- Pediatric Surgery
- Rheumatology (Pediatrics)
- Thoracic Surgery

Limitations

Caution must be taken when interpreting trends along the physician workforce supply chain as a result of methodological variations and limitations of the individual data sets. For example:

- Coding of specialties and subspecialties designations may change from year to year which may shift the numbers and statistics for a particular dataset. For example, the following note was extracted for the CIHI's 2016 SMDB methodological notes (pg. 21): "As of 2009, all certified specialties that a physician has received and that have been recorded in our database are considered to determine the parent specialty of subspecialties with more than one possible parent as defined by the Royal College. For example, nephrology is a subspecialty of either internal medicine or pediatrics. Depending on the other specialties the physician has received, starting in 2009, nephrologists are assigned to the most appropriate parent specialty (either internal medicine or pediatrics). However, prior to 2009, all nephrologists were assigned to internal medicine"

- There may be cases where the number of new trainees exceeds the allocated residency quota. Some individuals may defer admission into a residency program (e.g., maternity or sick leave), which would shift the entry into the program to a different year than the original match. Discrepancies may also result if a program year is repeated or if an individual moves between disciplines.

Acknowledgment and Disclaimer

The Medical Workforce Knowledgebase is made possible in part through the data published by the Canadian Resident Matching Service (CaRMS), the Canadian Post-M.D. Education Registry (CAPER), the College of Family Physicians of Canada (CFPC) and the Canadian Institute for Health Information (CIHI). The Royal College is grateful for the data provided by these organizations and holds them free of any errors, omissions or misinterpretations made by the Royal College in the use of their data. Through its use of the data the Royal College does not warrant the accuracy or validity of data published by other organizations.

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CIHI	"Parts of this material are based on data and information provided by the Canadian Institute for Health Information. However, the analyses, conclusions, opinions and statements expressed herein are those of the author and not necessarily those of the Canadian Institute for Health Information"