

Proportion of female recipients of resident-selected awards across Canada from 2000 to 2018: a retrospective observational study

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Abstract

Background: Female physicians have been shown to receive fewer awards from medical societies than their male colleagues. We examined the sex distribution of recipients of Canadian residency association awards.

Methods: We conducted a retrospective observational study of the sex of staff and resident physician recipients of resident-selected awards from provincial and national residency associations using data from 2000–2018. We classified awards into professionalism, advocacy and wellness awards, and education and teaching awards based on award names and descriptions, and compared the proportion of male and female recipients in these categories.

Results: We identified 314 recipients of staff physician awards and 129 recipients of resident physician awards. Male staff and resident physicians had higher odds of receiving awards than their female counterparts (odds ratio [OR] 1.45, 95% confidence interval [CI] 1.13–1.89 and OR 1.70, 95% CI 1.18–2.46, respectively). There was a reduction in the odds of male residents' receiving an award over the study period (OR 0.94, 95% CI 0.90–0.98). Male physicians had higher odds of receiving education and teaching awards than female physicians as staff but not as residents (OR 3.21, 95% CI 1.72–5.95 and OR 1.96, 95% CI 0.84–4.60, respectively).

Interpretation: Male staff and resident physicians in Canada had higher odds of receiving awards from provincial and national residency associations between 2000 and 2018 than their female counterparts. Given this disparity, it would be prudent for organizations that distribute awards to physicians, residents and medical students to examine their nomination criteria and processes for potential bias.

In Canada, the number of women admitted to medical schools has exceeded the number of men for 25 years.¹ Despite over 2 decades of numerical parity, evidence shows that female physicians continue to be underrepresented in academia, leadership and administration in Canada and worldwide.^{2–9} Substantial evidence exists that female physicians are held to a higher standard than their male peers in evaluations, assessments, grant applications, publishing and reference letters.^{10–19} Although there is evidence for explicit bias against female physicians,^{20–22} most bias is implicit, manifesting in subtle ways such as word choice when describing trainees and differential access to operating time.^{11,23–28}

Awards from residency associations allow residents to recognize physicians for their contributions. Unlike awards issued by other organizations, awards from residency associations reflect the values of residents, who may have different levels of bias than practising physicians. These awards may contribute to promotion, hiring, prestige and recognition.^{29,30}

Previous studies that have examined award recipients by sex have focused on awards given to staff physicians by national societies.^{29,31–34} We sought to evaluate whether male staff and resident physicians are more likely to receive an award from Canadian residency associations than female physicians.

Methods

We conducted a retrospective observational study of award recipient sex for staff and resident physicians who received awards from Canadian residency associations for 2000–2018.

Setting

In Canada, there are 17 medical faculties distributed across 10 provinces: 6 in Ontario, 4 in Quebec, 2 in Alberta, and 1 each in Newfoundland and Labrador, the Maritime provinces, Manitoba, Saskatchewan and British Columbia. There are 8 provincial or regional residency associations that represent

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residents in these 17 medical schools to local governments and health organizations. In addition, there is a single national organization that coordinates representation of residents across Canada. These associations represent over 10 000 resident doctors.³⁵

Data sources

We identified recipients of staff and resident awards by contacting Canadian residency associations through their websites' main contact email (Appendix 1, available at www.cmajopen.ca/content/8/2/E242/suppl/DC1). We contacted each organization at least twice to request records of awards given to staff and residents physicians from 2000 to 2018. We verified the names of award recipients using publicly available sources, including association and university websites and the association's official social media (Twitter and Facebook), when available. We collected the name, faculty status and discipline of the recipient, as well as the year and description of each award. Data were considered missing if the residency association confirmed that an award had been distributed but was unable to provide the name or sex of the recipient(s). Missing data were omitted, and we assumed that the sex of recipients was missing completely at random. Nonphysician award winners were excluded from analysis.

Recipient sex was assigned independently by the 2 authors based on the association's webpage or the directory of the provincial college of physicians and surgeons. Other publicly available records, including obituaries, were used if necessary to determine sex. We determined interrater agreement using the Cohen κ statistic. The recipient's discipline of practice was assigned based on his or her current registration with the relevant college of physicians and surgeons. We categorized discipline into 4 main categories — family medicine, laboratory medicine specialties, medical specialties and surgical specialties — based on the classification of the Canadian Post-M.D. Education Registry, a central source for all postgraduate medical education data.³⁶ Disagreements were reconciled by discussion between the 2 authors and comparison of the data source; further disagreements were resolved by a third, independent researcher. Recipients who received multiple awards were included for each award received.

Staff physicians

We determined the total number of male and female staff physicians eligible to receive awards per year by 2 methods. First, we defined faculty physicians using publicly available data from the Association of Faculties of Medicine of Canada,¹ which provides the number of full-time physician members at each faculty of medicine. This number represents physicians in academic faculties who are most likely to interact with residents and therefore receive awards from residents. The database, however, does not capture all physicians with whom residents interact, especially those who work in the community nonacademic hospitals through which residents rotate.

Data on sex of physician faculty members were available in the Association of Faculties of Medicine of Canada database for 2011–2017. We extrapolated the number of female and

male faculty members in Canada for 2000–2011 and 2018 based on the mean change in numbers of male and female faculty physicians per year for 2011–2017.

We also estimated the number of male and female practising physicians eligible to receive awards from a list of all physicians (nontrainee) who work in Canada obtained from the Canadian Medical Association (CMA).³⁷ These data were available by request for 2005–2018. We extrapolated data for 2000–2004 based on the mean change in male and female physicians from 2005 to 2018, as described above. We also used CMA data to determine the number of female and male physicians practising in each discipline category.

Residents

We determined the total number of eligible male and female residents per year using data from the Canadian Post-M.D. Education Registry.³⁶ The registry has collected data on the number of resident physicians annually since 1986 from the Canadian faculties of medicine; these data are cross-referenced for errors. Residents attending universities in provinces with missing award recipient data were excluded from analyses. For example, data on award recipient sex for 2003 were available only from the Ontario residents association; therefore, we included only male and female residents registered at Ontario universities as eligible to receive awards for that year. Specific awards from the Professional Association of Residents of Ontario, such as the Resident Teaching Award, were awarded only to specific universities during the study period; for example, the Professional Association of Residents of Ontario awards a Resident Teaching Award to each university individually. Only residents attending universities that distributed an award were included as eligible.

Award category

Each award was classified independently by the 2 authors as 1) education and teaching or 2) professionalism, advocacy and wellness (resident or patient) based on the award name or description. We chose these 2 categories to distinguish the medical expert role from other CanMEDS roles as there is evidence that medical expert awards may contribute more to promotion decisions than other awards.³⁸ CanMEDS is a framework for Canadian residency education that describes the key competencies of physicians: scholar, professional, communicator, collaborator, health advocate and leader, all of which overlap with the central role of medical expert.³⁹ We considered 38 award categories (Appendix 2, available at www.cmajopen.ca/content/8/2/E242/suppl/DC1). For analyses based on award category subgroups, we excluded awards that did not clearly indicate its category subgroup (e.g., “merit” or “spirit” awards). Disagreements were reconciled by discussion between the 2 authors and comparison of the data source; further disagreements were resolved by a third, independent researcher. We determined interrater agreement using the Cohen κ statistic.

Statistical analysis

We calculated the median and interquartile range (IQR) for the proportion of female award recipients per year. We performed

frequentist analysis by defining odds ratios (ORs) as the odds of male staff or resident physicians’ receiving awards compared to the odds of female staff or resident physicians’ receiving awards. For staff physicians, we calculated ORs using the number of male and female faculty physicians (Association of Faculties of Medicine of Canada data) and also using the total number of male and female practising physicians (CMA data). We calculated these ORs, 95% confidence intervals (CIs) and 2-sided Fisher exact *p* values. We performed logistic regression to evaluate the association of recipient sex and odds of receiving an award, adjusted for year.

In addition, we constructed Bayesian binomial models for staff and resident physicians, with sex as the single covariate. We estimated the effect of sex within each specialty category using a hierarchical random effects model. Bayesian regression requires specification of distributions representing the possible range of effect for each parameter before the data are incorporated. We defined prior distributions for each of the parameters as follows: intercept (0,3), coefficient normal (0,2), standard deviation Cauchy (0,1) and correlation between

intercept and slope as LKJ (3). For this study, the median of the posterior distribution was reported as the primary measure of association with 95% posterior intervals (PIs), which do not describe statistical significance but, rather, the uncertainty range compatible with 95% of subjects.

We performed all analyses using Stata release 15 (StataCorp.).

Ethics approval

We received a waiver of ethics approval from our institutional ethics board because we used publicly available data for this study.

Results

All 9 associations responded to the data request. One association did not issue any awards, and another did not distribute awards to residents during the study period. The remaining 7 associations provided data for staff and resident physicians (Table 1; Appendix 2). When we verified the data provided

Table 1: Number of awards distributed to staff and resident physicians by Canadian provincial and national residency associations, 2000–2018, by award category*

Residency association	Total	Professionalism, advocacy and wellness†	Education and teaching†	Not classified‡
Staff recipients				
RDOC	25	12	13	0
RDBC	35	17	18	0
PARA	69	31	38	0
RDOS	65	0	65	0
PARIM	27	0	23	4
PARO	79	4	75	0
Mar-Docs	4	0	4	0
PAR-NL	10	0	10	0
Total	314	64	246	4
Resident recipients				
RDOC	19	11	8	0
RDBC	13	13	0	0
RDOS	10	10	0	0
PARIM	5	1	1	3
PARO	68	0	68	0
Mar-Docs	5	5	0	0
PAR-NL	9	0	0	9
Total	129	40	77	12

Note: Mar-Docs = Maritime Resident Doctors, PARA = Professional Association of Resident Physicians of Alberta, PARIM = Professional Association of Residents and Interns of Manitoba, PAR-NL = Professional Association of Residents of Newfoundland and Labrador, PARO = Professional Association of Residents of Ontario, RDBC = Resident Doctors of British Columbia, RDOC = Resident Doctors of Canada, RDOS = Resident Doctors of Saskatchewan.

*For a list of award names and criteria, see Appendix 2.

†Assigned based on award name or nomination criteria, where available.

‡Included awards that were not classified as professionalism, advocacy and wellness, or education and teaching awards based on award name or nomination criteria, where available.

by 5 associations using publicly available sources, we noted no discrepancies. Agreement between reviewers who assigned recipient sex based on names was high (Cohen $\kappa = 0.95$). We were able to assign sex using the relevant provincial college of physicians and surgeons data for all but 3 award applicants, whose sex was identified by pronoun use in an obituary.

Staff physician award recipients

There were 314 staff physician award recipients in 2000–2018 (Table 1). Award recipient data were missing for 26 awards (7.6%). There were 5–29 awards distributed per year (Table 2). The median proportion of female staff physician recipients per year was 26.1% (IQR 17.9%–32.3%). In total, 84 (26.8%) recipients of staff physician awards were female.

Overall, the odds of a male staff physician’s receiving an award was greater than that of a female physician (OR 1.45, 95% CI 1.13–1.89). This result did not change when we included all eligible practising physicians (CMA data) (OR 1.64, 95% CI 1.28–2.13) or with Bayesian modelling (OR

1.95, 95% PI 1.54–2.46) (Table 3). The odds of a male staff physician’s receiving an award increased over the study period (OR 1.03, 95% CI 1.01–1.05) (Figure 1). After adjustment for year, male sex continued to be associated with higher odds of receiving an award as a staff physician (OR 1.53, 95% CI 1.19–2.96).

Resident physician award recipients

There were 129 resident physician awards distributed between 2002 and 2018, with 2–16 awards distributed per year (Table 1, Table 4). The sex of the award recipients was missing for 4 awards (3.1%). Fifty-two resident recipients (40.3%) were female. The median proportion of female award recipients per year was 40.0% (IQR 25.0%–42.9%).

Overall, frequentist and Bayesian modelling showed that the odds of male residents’ receiving an award was greater than that of female residents (OR 1.70, 95% CI 1.18–2.46 [Table 4] and OR 1.54, 95% PI 1.14–2.18 [Table 3], respectively). The odds of a male resident’s receiving an award

Table 2: Number of full-time faculty physicians who received an award from a Canadian residency association proportion, by sex, and odds of receiving an award*

Year	No. of male award winners (% of total awards)	Total no. of male faculty physicians (% of eligible physicians†)	No. of female award winners (% of total awards)	Total no. of female faculty physicians (% of eligible physicians†)	OR (95% CI)
2018‡	20 (69.0)	8514 (61.1)	9 (31.0)	5418 (38.9)	1.41 (0.61–3.53)
2017	13 (65.0)	8304 (61.5)	7 (35.0)	5201 (38.5)	1.16 (0.43–3.44)
2016	14 (73.7)	8189 (62.8)	5 (26.3)	4859 (37.2)	1.66 (0.57–5.90)
2015	20 (74.1)	8102 (62.9)	7 (25.9)	4776 (37.1)	1.68 (0.68–4.72)
2014	17 (77.3)	7960 (63.2)	5 (22.7)	4644 (36.8)	1.98 (0.70–6.88)
2013	14 (66.7)	7346 (63.8)	7 (33.3)	4175 (36.2)	1.14 (0.43–3.33)
2012	16 (64.0)	7212 (64.4)	9 (36.0)	3993 (35.6)	0.98 (0.41–2.53)
2011	14 (60.9)	6940 (64.8)	9 (39.1)	3777 (35.2)	0.85 (0.34–2.22)
2010‡	16 (84.2)	6730 (64.1)	3 (15.8)	3776 (35.9)	2.99 (0.86–16.03)
2009‡	11 (84.6)	6520 (64.5)	2 (15.4)	3559 (35.5)	3.00 (0.65–27.88)
2008‡	15 (78.9)	6310 (65.4)	4 (21.1)	3342 (34.6)	1.99 (0.63–8.23)
2007‡	11 (73.3)	6100 (66.1)	4 (26.7)	3125 (33.9)	1.41 (0.42–6.07)
2006‡	6 (100.0)	5890 (66.9)	0 (0.0)	2908 (33.1)	5.44 (0.30–98.35)
2005‡	10 (76.9)	5680 (67.9)	3 (23.1)	2691 (32.1)	1.58 (0.41–8.94)
2004‡	7 (70.0)	5470 (68.9)	3 (30.0)	2474 (31.1)	1.06 (0.24–6.33)
2003‡	9 (90.0)	5260 (70.0)	1 (10.0)	2257 (30.0)	3.86 (0.53–169.3)
2002‡	6 (54.5)	5050 (71.2)	5 (45.5)	2040 (28.8)	0.48 (0.12–2.01)
2001‡	7 (100.0)	4840 (72.6)	0 (0.0)	1823 (27.4)	8.68 (0.51–147.45)
2000‡	4 (80.0)	4630 (74.2)	1 (20.0)	1606 (25.8)	1.39 (0.14–68.36)
Total‡	230 (73.2)	125 047 (65.3)	84 (26.8)	66 444 (34.7)	1.45 (1.13–1.89)

Note: CI = confidence interval, OR = odds ratio.

*Odds of male physicians’ receiving an award divided by odds of female physicians’ receiving an award.

†The number of eligible male and female physicians who received awards was estimated from Association of Faculties of Medicine of Canada data.

‡Contains estimates where data were not available and the numbers of male and female faculty physicians were extrapolated.

Table 3: Recipients of awards stratified by recipient discipline

Discipline	Total no. (%) of awards distributed	No. (%) of female award recipients	No. (%) of females in discipline*	Median OR (95% PI†)
Staff physician recipients				
Family medicine‡	39 (12.4)	15 (38.5)	19 981 (45.9)	1.50 (0.90–2.22)
Laboratory medicine§	5 (1.6)	2 (40.0)	746 (41.5)	1.66 (0.81–2.75)
Medical specialists¶	138 (43.9)	35 (25.4)	11 645 (40.5)	1.91 (1.44–2.59)
Surgical specialists**	40 (12.7)	8 (20.0)	3000 (29.3)	1.75 (1.13–2.71)
Unknown	92 (29.3)	24 (26.1)	–	–
Total	314 (100.0)	84 (26.8)	35 372 (42.0)	1.95 (1.54–2.46)
Resident physician recipients				
Family medicine‡	13 (10.1)	3 (23.1)	2137 (60.8)	1.90 (1.07–5.03)
Laboratory medicine§	0 (0.0)	0 (0.0)	208 (53.9)	–
Medical specialists¶	65 (50.4)	29 (44.6)	3926 (51.7)	1.44 (0.97–2.08)
Surgical specialists**	32 (24.8)	10 (31.2)	1226 (46.9)	1.35 (0.75–2.15)
Other††	0 (0.0)	0 (0.0)	5 (0.1)	–
Unknown	19 (14.7)	10 (52.6)	–	–
Total	129 (100.0)	52 (40.3)	7502 (53.1)	1.54 (1.14–2.18)

Note: OR = odds ratio, PI = posterior interval.
 *In 2018, based on data on discipline and sex from the Canadian Medical Association for staff physician recipients and data from the Canadian Post-M.D. Education Registry (CAPER) for resident physicians.
 †95% posterior intervals obtained from Bayesian modelling do not describe statistical significance but, rather, the uncertainty range compatible with 95% of subjects.
 ‡Includes family medicine and the Enhanced Skills training programs (e.g., family medicine plus emergency medicine), based on the CAPER classifications.
 §Includes anatomic pathology, general pathology, hematologic pathology, medical biochemistry, medical microbiology and neuropathology, based on the CAPER classifications.
 ¶Includes anesthesiology, dermatology, diagnostic radiology, emergency medicine, internal medicine (including all subspecialties of internal medicine), medical genetics and genomics, neurology, neurology – pediatric, nuclear medicine, palliative medicine, pediatrics (including all subspecialties of pediatrics), physical medicine and rehabilitation, psychiatry, public health and preventive medicine, and radiation oncology, based on the CAPER classifications.
 **Includes cardiac surgery, general surgery, neurosurgery, obstetrics and gynecology, ophthalmology, otolaryngology, orthopedic surgery, plastic surgery, urology and vascular surgery, based on the CAPER classifications.
 ††Includes cytopathology, transfusion medicine, adult interventional cardiology and adult echocardiography, based on the CAPER classifications.

decreased during the study period (OR 0.94, 95% CI 0.90–0.98) (Figure 2). Male residents had higher odds of receiving an award after adjustment for award year (OR 1.70, 95% CI 1.20–2.43).

Award categories

Of the 314 staff awards, 310 were classifiable (Table 5). Agreement between reviewers who assigned award category was excellent (Cohen κ = 1.00). Female staff physicians accounted for 30 (46.9%) of the 64 professionalism, advocacy and wellness award recipients and 53 (21.5%) of the 246 education and teaching award recipients. Male physicians were more likely to win an education and teaching award than female physicians (OR 3.21, 95% CI 1.72–5.95).

A total of 117 of the 129 resident awards were classifiable (Table 5). Female residents received 20 (50.0%) of the 40 professionalism, advocacy and wellness awards and 26 (33.8%) of the 77 education and teaching awards. Male residents did not have higher odds of receiving an

education and teaching award after adjustment for award year (OR 1.96, 95% CI 0.84–4.60).

Recipient discipline

Recipient discipline was available for 222 recipients of staff physician awards (70.7%) and 110 recipients of resident physician awards (85.3%). Bayesian modelling showed that male staff and resident physicians had higher odds of receiving awards than female staff and resident physicians in all specialty categories (Table 3). There was greater uncertainty in estimates for laboratory and family medicine, but the data were most compatible with greater odds of male physicians’ receiving awards in these specialties as well (Appendix 3, available at www.cmajopen.ca/content/8/2/E242/suppl/DC1).

Interpretation

Our study shows that, from 2000 to 2018, male physicians had higher odds of receiving awards as staff and residents

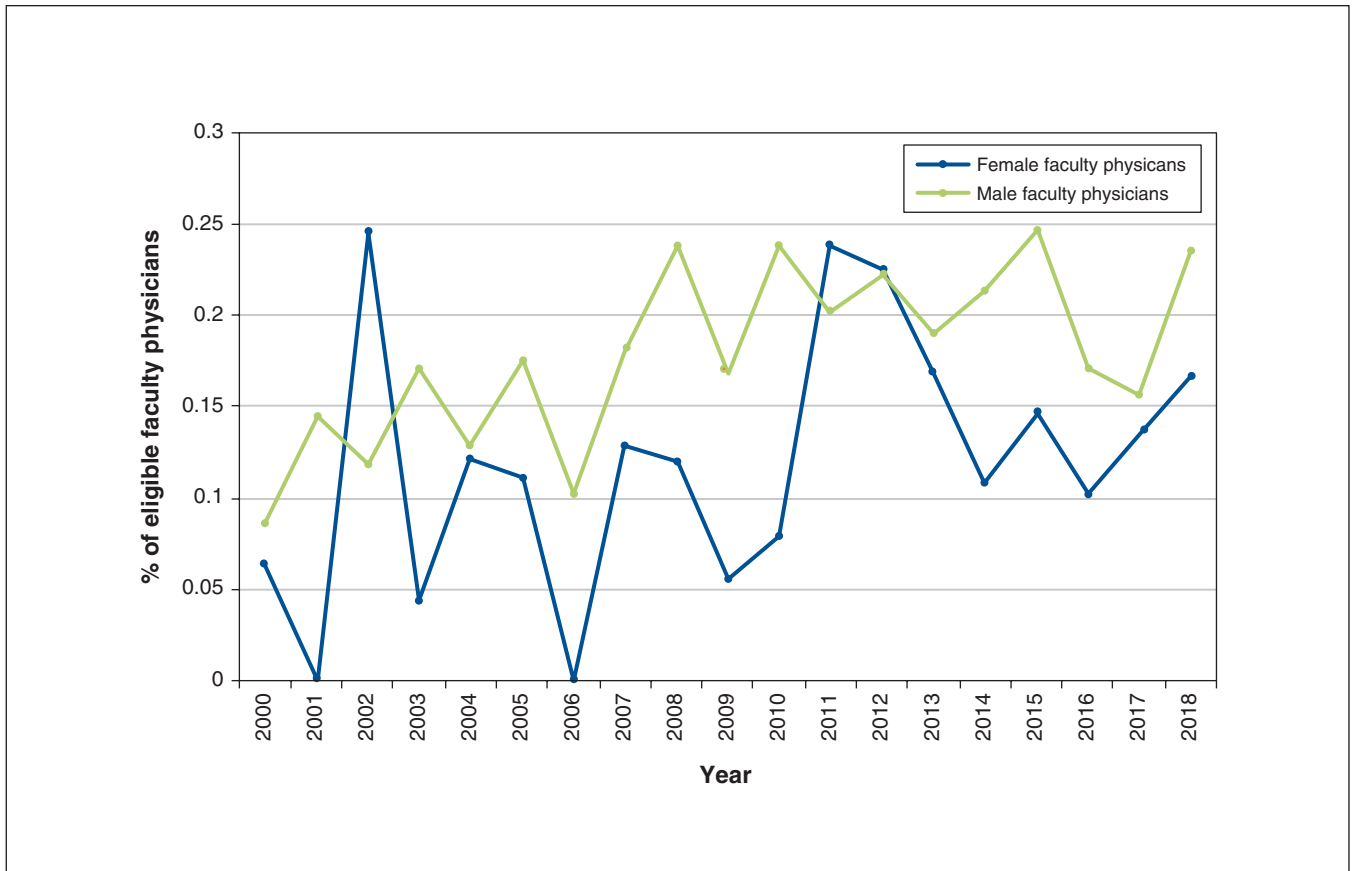


Figure 1: Proportion of eligible full-time faculty physicians in Canada who won residency association awards, 2000–2018, by sex (Association of Faculties of Medicine of Canada data).

than did female physicians. There were no years in which there were more female recipients of staff physician awards than male recipients. The proportion of eligible female staff physicians who received awards was lower than the proportion of eligible male staff physicians who won awards for all but 3 years in the study period. Similarly, despite accounting for more than half of all residents since 2008, female residents received more awards than male residents in only 3 study years. Male staff and resident physicians from all specialty categories were more likely to win awards than their female counterparts. Altogether, these results suggest that female physicians were consistently underrepresented as award recipients relative to their overall proportion in Canada from 2000 to 2018.

In addition, female physicians were more likely than male physicians to receive professionalism, advocacy and wellness awards than education and teaching awards. Education and teaching awards are used for promotion decisions, whereas the value of receiving a wellness award is less established.³⁸ This finding is consistent with literature showing that female physicians receive lower ratings on teaching evaluations than their male colleagues, even after teaching quality is controlled for.¹⁸ In deception-design studies, students rated teachers whom they perceived as

women lower than those they perceived as men, even when the actual gender of the instructor varied.⁴⁰

Our results are consistent with studies describing underrepresentation of female physicians as recipients of awards from medical and surgical specialty societies.^{31–33,41} Female medical students have also been shown to be less likely to receive an honours distinction on a research thesis than their male peers, even after adjustment for mentorship, advanced degrees and time spent on the project.⁴²

Overall, our study on resident association awards adds to the current body of literature suggesting that female physicians are evaluated less favourably than male physicians in multiple settings, including teaching evaluations,¹⁸ student evaluations,¹¹ prestigious research awards⁴³ and grant applications.^{19,44} Of note, these differences are not shown consistently.⁴⁵ We have identified bias against female physicians in the selection of residency association awards; this bias may further perpetuate inequities in hiring, promotion and grant attainment. Best practice guidelines on how to avoid wording in applications that discourage female applicants or nominations may be helpful.

Limitations

This study is limited by the small number of awards presented per year, in particular for resident physicians,

Table 4: Number of resident physicians who received an award from a Canadian residency association, by sex, and odds of receiving an award*

Year	No. of male resident award winners (% of total awards)	No. of male residents (% of eligible resident physicians)	No. of female resident award winners (% of total awards)	No. of female residents (% of eligible resident physicians)	OR (95% CI)
2018†	11 (68.8)	6626 (46.9)	5 (31.3)	7502 (53.1)	2.49 (0.80–9.15)
2017†	8 (50.0)	6596 (47.0)	8 (50.0)	7449 (53.0)	1.13 (0.37–3.45)
2016†	7 (58.3)	6525 (46.6)	5 (41.7)	7474 (53.4)	1.60 (0.44–6.41)
2015†	5 (41.7)	6292 (46.0)	7 (58.3)	7393 (54.0)	0.84 (0.21–3.07)
2014†	2 (25.0)	6065 (45.3)	6 (75.0)	7314 (54.7)	0.40 (0.04–2.25)
2013†	4 (44.4)	5917 (45.7)	5 (55.6)	7034 (54.3)	0.95 (0.19–4.42)
2012†	5 (62.5)	5682 (45.6)	3 (37.5)	6785 (54.4)	1.99 (0.39–12.82)
2011‡	6 (100.0)	2076 (48.8)	0 (0.0)	2180 (51.2)	8.43 (1.13–374.14)
2010†	4 (57.1)	5136 (46.3)	3 (42.9)	5945 (53.7)	1.54 (0.26–10.54)
2009§	4 (66.7)	1593 (48.2)	2 (33.3)	1713 (51.8)	2.15 (0.31–23.80)
2008§	3 (75.0)	1484 (48.2)	1 (25.0)	1594 (51.8)	3.22 (0.26–169.24)
2007¶	4 (100.0)	1005 (59.8)	0 (0.0)	998 (40.2)	8.97 (0.48–166.89)
2006¶	3 (60.0)	958 (50.6)	2 (40.0)	934 (49.4)	1.46 (0.17–17.54)
2005§	3 (60.0)	1289 (51.7)	2 (40.0)	1203 (48.3)	1.40 (0.16–16.78)
2004¶	3 (60.0)	947 (54.9)	2 (40.0)	778 (45.1)	1.23 (0.14–14.79)
2003¶	3 (75.0)	926 (55.3)	1 (25.0)	747 (44.7)	2.42 (0.19–127.20)
2002**	2 (100.0)	227 (64.3)	0 (0.0)	126 (35.7)	2.80 (0.13–58.88)
Total	77 (59.7)	59 344 (46.9)	52 (40.3)	67 169 (53.1)	1.70 (1.18–2.46)

Note: CI = confidence interval, OR = odds ratio.
 *Odds of male physicians' receiving an award divided by odds of female physicians' receiving an award.
 †All residents included.
 ‡Includes residents from Western University, the University of Toronto, the University of British Columbia and the University of Manitoba.
 §Includes residents from Western University, the University of Toronto and the University of British Columbia.
 ¶Includes residents from Western University and the University of Toronto.
 **Includes Western University data.

which limited the study's power to detect differences for individual years. Not all residency organizations kept consistent records, and there are missing data. As well, there is no validity evidence for the accuracy or completeness of registry data used to estimate the number of eligible physicians, and the numbers of female and male physicians in residency and active practice and working as faculty members were estimated for some years. We were able to compare only the proportion of female and male physicians who received awards, not the proportion who were nominated. Therefore, we were not able to determine whether the discrepancy between the sexes occurred on the basis of award criteria or nominations or in recipient selection processes.

In addition, we had to make several assumptions when estimating how many staff physicians were eligible for awards. We assumed that all faculty physicians working at Canadian medical schools, regardless of sex, had equal probability of receiving an award; this does not account for differences in seniority, academic rank and other factors that may affect the likelihood of receiving an award that differ by physician sex.

Furthermore, the number of male and female faculty and practising physicians in Canada had to be estimated for some years of analysis owing to missing data.

Our data sources did not allow nonbinary categorizations of gender. Our study did not include local awards, such as those given by individual schools and faculties of medicine. Finally, without access to the actual awards applications, we could not control for the effects of application quality, nor could we adjust for other measured or unmeasured confounders.

Conclusion

Male staff and resident physicians in Canada had higher odds of receiving awards from provincial and national residency associations between 2000 and 2018 than their female counterparts. Given this disparity, it would be prudent for organizations that distribute awards to physicians, residents and medical students to closely examine their nomination criteria and processes for potential bias. We suggest that processes be developed within organizations to encourage an equitable nomination pool for awards.

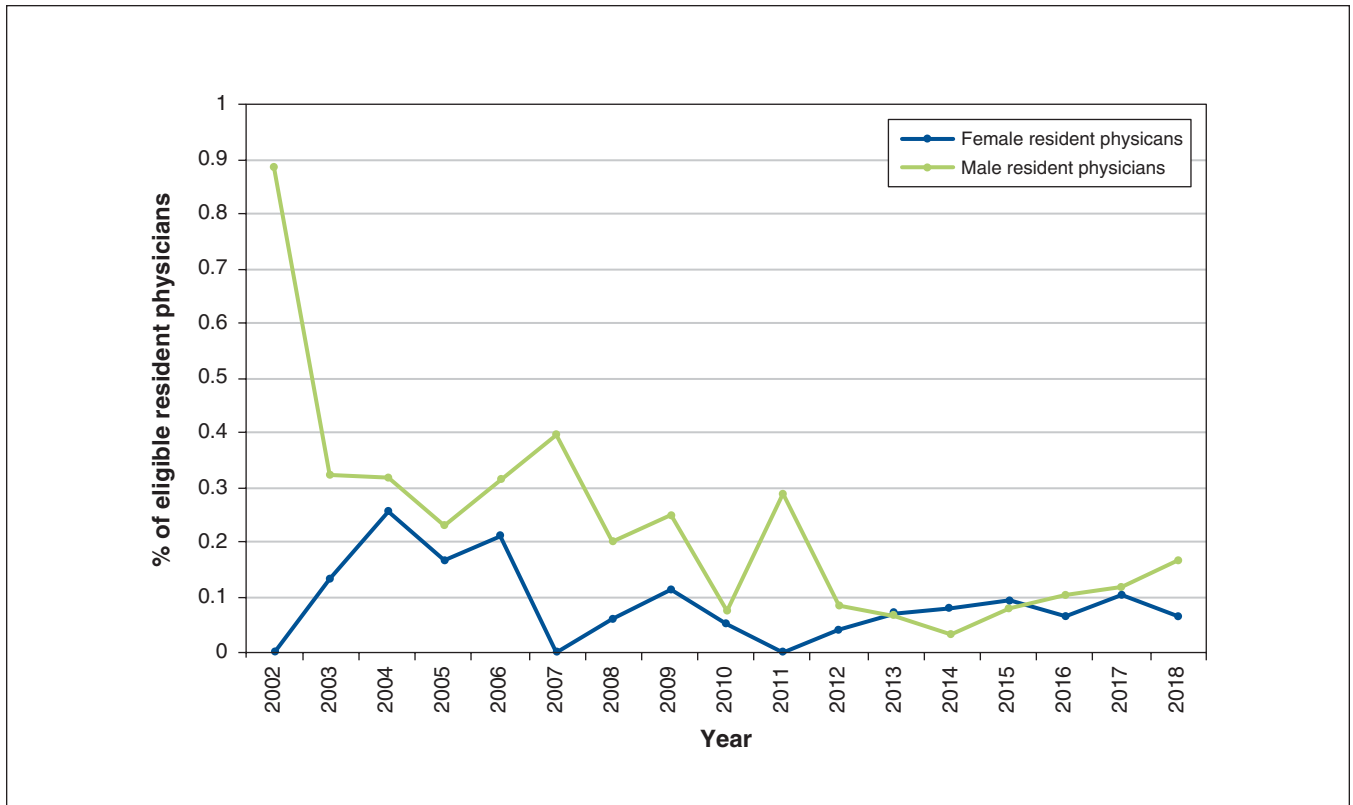


Figure 2: Proportion of eligible resident physicians in Canada who won residency association awards, 2002–2018, by sex.

Table 5: Number of staff and resident physician recipients of professionalism, advocacy and wellness awards, and education and teaching awards

Physician	Professionalism, advocacy and wellness awards		Education and teaching awards		OR (95% CI)
	Total awards distributed	No. (%) of female award recipients	Total awards distributed	No. (%) of female award recipients	
Staff	64	30 (46.9)	246	53 (21.5)	3.21 (1.72–5.95)
Residents	40	20 (50.0)	77	26 (33.8)	1.96 (0.84–4.60)

Note: CI = confidence interval, OR = odds ratio.

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