

## Regional differences in where and how family medicine residents intend to practise: a cross-sectional survey analysis

M. Ruth Lavergne PhD, Ian Scott MSc MD, Goldis Mitra MD, David Snadden MBChB MD, Doug Blackie MPA, Laurie J. Goldsmith PhD, David Rudoler PhD, Lindsay Hedden PhD, Agnes Grudniewicz PhD, Megan A. Ahuja MPH, Emily Gard Marshall PhD

### Abstract

**Background:** Family medicine residents choose among a range of practice options as they enter the physician workforce. We describe the demographic and personal characteristics of Canadian family medicine residents and examine differences in the intentions of residents from Ontario, Quebec, Western Canada and Atlantic Canada at the completion of their training, in terms of practice comprehensiveness, organizational model, clinical domains, practice settings and populations served.

**Methods:** We analyzed national survey data collected by the College of Family Physicians of Canada and 16 university-based family medicine residency programs. We tabulated bivariable descriptive results and used logistic regression to estimate odds of practice intentions across regions, adjusting for family medicine resident characteristics.

**Results:** Of 1680 respondents (61.5% of 2731 family medicine residents invited to participate), 66.3% ( $n = 1095$ ) reported it was somewhat or highly likely they would commit to providing comprehensive care to the same group of patients within their first 3 years of practice. This percentage varied from 40.3% in Atlantic Canada to 85.1% in Ontario. In addition, 31.5% ( $n = 522$ ) reported it was somewhat or highly likely they would focus only on specific clinical areas. Most respondents reported it was somewhat or highly likely that they would practise in a group physician practice (93.8%) or interprofessional team-based practice (88.1%), and only 7.7% expected to have a solo practice.

**Interpretation:** Intentions for comprehensive and focused practice varied, but over 80% of family medicine residents indicated they intended to practise in a team-based model in all regions. Policy-makers and workforce planners should consider the impact of family medicine residents' intentions on policy objectives.

Challenges in accessing primary care persist across Canada despite historically high ratios of primary care providers per capita.<sup>1-4</sup> Changes in the amounts primary care physicians work<sup>5</sup> and in the types of services they deliver<sup>6,7</sup> may help explain this. Upon completion of training, family physicians may choose comprehensive (generalist) practice or may focus their practice on a particular clinical area (e.g., emergency medicine, palliative care, sports medicine or addictions medicine). They may also choose among several organizational models, including solo practice, group physician practice and interprofessional team-based care, as well as clinical domains, populations served and practice settings. Their choices may shape the supply of primary care services available to patients. Organizational models and associated payment systems (e.g., fee-for-service, salary, capitation) vary markedly among regions in Canada<sup>8-10</sup> and may also shape physician practice choices and behaviour.<sup>11-14</sup>

Although some research has examined medical students' choice of family medicine as a specialty,<sup>15-18</sup> there is only

limited information available about the practice intentions of Canadian family medicine residents.<sup>19,20</sup> In the present study, we answer the following question: Do the practice intentions of family medicine residents differ among regions in Canada? We use national survey data to describe demographic and personal characteristics of family medicine residents and examine differences in the intentions of residents from Ontario, Quebec, Western Canada and Atlantic Canada with respect to practice comprehensiveness, organizational model, clinical domains, practice settings and populations served.

**Competing interests:** None declared.

This article has been peer reviewed.

**Correspondence to:** Ruth Lavergne, ruth\_lavergne@sfu.ca

**CMAJ Open 2019. DOI:10.9778/cmajo.20180152**

## Methods

### Data

We analyzed data from the Family Medicine Longitudinal Survey, which was administered by the College of Family Physicians of Canada to trainees in 16 university-based family medicine residency programs.<sup>21</sup> The Family Medicine Longitudinal Survey was developed by the College of Family Physicians of Canada as part of a program evaluation of curricular reforms within family medicine residency (the Triple C competency-based curriculum).<sup>21</sup> The survey was piloted in 2012 and 2013 in 8 family medicine programs. Questions were developed to reflect graduates' intentions for practice and confidence in their skills and knowledge upon completion of their residency program.<sup>22</sup> The survey also provides information about graduate experience with the curriculum, but this is outside the scope of our analysis.

Surveys were sent to all family medicine residents in Canada within 3 months of program completion and were offered both in paper format and online.<sup>22</sup> Our analysis focused on responses to questions about practice intentions with respect to comprehensiveness, organizational model, clinical domains, settings and populations served (see full questions in Appendix 1 available at [www.cmajopen.ca/content/7/1/E124/suppl/DC1](http://www.cmajopen.ca/content/7/1/E124/suppl/DC1)) among family medicine residents exiting residency in 2016 and 2017. The survey measured intentions for practice on a 5-point Likert scale: "highly likely," "somewhat likely," "neutral," "somewhat unlikely" or "highly unlikely."

### Analysis

We dichotomized responses by grouping the "somewhat likely" and "highly likely" responses and the "neutral," "somewhat unlikely" and "highly unlikely" responses. Responses were not normally distributed and we could not assume they could be treated as interval data. Given the number of practice intention variables analyzed it was also impractical to report frequencies across all 5 categories for each scale. Dichotomizing responses in this way provides interpretable results where proportions and odds reflect positive intentions for each practice variable. We conducted sensitivity analysis to confirm that grouping the "neutral" responses with the "somewhat likely" and "highly likely" responses resulted in similar patterns across regions.

We summarized the demographic and personal characteristics of respondents and the number and percentage of respondents selecting "somewhat likely" or "highly likely" for all survey questions capturing practice intentions, overall and in each region (Atlantic Canada, Quebec, Ontario and Western Canada; data were provided only by region). We investigated differences among regions using  $\chi^2$  tests. To explore how survey respondents differ from all family medicine residents we compared respondent characteristics with publicly available data from the Canadian Post-MD Education Registry.<sup>23</sup>

We used logistic regression to examine the relationship between region and each dichotomized practice intention variable. Multivariable models controlled for sex/gender, location of medical training (Canadian or international medical graduates),

age and childhood geographic environment (inner city/urban/suburban, small town, rural/remote/isolated or mixed [if the respondent lived in more than 1 type of environment]). (Note that the survey used the word *sex*, but we use the term *sex/gender* because it was not possible in this analysis to distinguish between sex and gender effects: it is plausible that biological differences specific to pregnancy and childbirth may shape intentions to some degree, but it is likely that socially constructed gender plays a larger role.) We excluded the number of years in service because it was colinear with age. We also included a control variable that captured whether family medicine residents intended to work in an urban or rural environment. We did this because intentions for specific clinical domains, settings and populations may be closely connected to whether family medicine residents anticipated practising in a rural or urban environment and intentions for rural practice differed markedly among regions. We confirmed that patterns across regions were similar in models including years of service instead of age and excluding intentions for work in an urban or rural environment. Respondents for whom data were missing for variables other than the outcome of interest were retained with indicator variables for "missing/prefer not to answer." We excluded respondents with missing data for practice outcomes from each model. In describing results of logistic regression, we report odds of intentions for each practice outcome, as shorthand for odds of selecting "somewhat likely" or "highly likely" versus selecting "neutral," "somewhat unlikely" or "highly unlikely."

### Ethics approval

Ethics approval was obtained from each participating residency program's local ethics boards to implement the survey as part of a longitudinal study and program evaluation plan.<sup>21</sup> Ethics approval for secondary analysis of the Family Medicine Longitudinal Survey data was obtained from the Simon Fraser University Research Ethics Board (reference no. 2017s0157).

## Results

### Characteristics of respondents

All 2731 family medicine residents exiting residency in Canada in 2016 and 2017 were invited to complete the survey. Response rates were 60.1% (785/1306) in 2016 and 62.8% (895/1425) in 2017; the overall response rate was 61.5%. We observed statistically significant differences among regions with respect to sex/gender, training location, age, number of years since medical degree was obtained and childhood environment (Table 1). A total of 62.4% of respondents were women ( $n = 1027$ ); the percentage varied from 54.7% ( $n = 355$ ) in Western Canada to 68.1% ( $n = 378$ ) in Ontario. The percentage of international medical graduates varied from 4.8% ( $n = 24$ ) in Ontario to 21.1% ( $n = 140$ ) in Western Canada. Ontario respondents were younger and had more recently completed their MDs than respondents from the other regions of the country. Quebec had the highest percentage of respondents reporting that they grew up in an inner city, urban or suburban environment (71.7%,  $n = 276$ ) and Atlantic Canada the lowest (47.6%,  $n = 30$ ).

We compared 2017 survey respondents with all family medicine residents in the Canadian Post-MD Education Registry<sup>22</sup> in 2017. Among the 895 respondents exiting residency in 2017, the average age was 30.5 years, 546 (61.0%) were women and 131 (14.6%) were international medical graduates. The percentages were comparable for the 1438 family medicine trainees exiting residency in 2017 captured in the Canadian Post-MD Education Registry<sup>22</sup>: the average age was 30.1 years, 62.1% were women and 15.5% were international medical graduates.

Responses to questions about practice intentions were missing for between 19 (1.0%, questions 16b and 16c) and 104 respondents (6.2%, question 21n). The number of respondents included in the analysis of each practice intention variable is reported in Table 2.

### Comprehensive care and confidence in current ability

Across Canada, 66.3% of family medicine residents ( $n = 1095$ ) reported it was somewhat or highly likely they would commit to providing comprehensive care to the same group of

patients in their first 3 years of practice. This varied from 40.3% ( $n = 27$ ) in Atlantic Canada to 85.1% ( $n = 474$ ) in Ontario (Table 2). Over 90% of respondents ( $n = 1529$ ) reported they were confident in their ability to provide comprehensive care to the same group of patients over time; the percentage was slightly lower in Atlantic Canada (82.1%,  $n = 55$ ). In multivariable models, significant differences in intentions to provide comprehensive care persisted, but regional differences in confidence were not significant (Appendix 2 available at [www.cmajopen.ca/content/7/1/E124/suppl/DC1](http://www.cmajopen.ca/content/7/1/E124/suppl/DC1)).

### Organizational models

Higher percentages of respondents in Quebec (65.7%,  $n = 251$ ) and Western Canada (63.7%,  $n = 416$ ) than in the other regions indicated that they intended to provide care in 1 clinical setting (Table 2). This effect persisted in multivariable analysis (Appendix 2). A higher percentage of respondents in Atlantic Canada than in the other regions anticipated providing care across multiple clinical settings (83.6%,  $n = 56$ ) (Table 2). This effect was attenuated in multivariable analysis (Appendix 2).

**Table 1: Characteristics of family medicine residents exiting training programs in 2016 and 2017 who responded to the Family Medicine Longitudinal Survey, by region**

Characteristic	No. (%) of respondents					p value*
	Total <i>n</i> = 1680	Ontario <i>n</i> = 561	Western Canada <i>n</i> = 663	Atlantic Canada <i>n</i> = 68	Quebec <i>n</i> = 388	
<b>Sex/gender</b>						< 0.001
Male	619 (37.6)	177 (31.9)	291 (45.3)	23 (35.4)	128 (33.7)	
Female	1027 (62.4)	378 (68.1)	355 (54.7)	42 (64.6)	252 (66.3)	
<b>Location of MD training</b>						< 0.001
Canada	1386 (85.6)	477 (95.2)	523 (78.9)	59 (86.8)	327 (84.5)	
International	233 (14.4)	24 (4.8)	140 (21.1)	9 (13.2)	60 (15.5)	
<b>Age, yr</b>						< 0.001
< 30	931 (58.6)	410 (73.3)	318 (48.3)	28 (42.4)	175 (57.0)	
30–34	433 (27.2)	80 (14.3)	222 (33.7)	24 (36.4)	107 (34.9)	
≥ 35	226 (14.2)	69 (12.3)	118 (17.9)	14 (21.2)	25 (8.1)	
<b>Time since completion of MD training, yr</b>						< 0.001
2	1325 (79.1)	470 (83.8)	489 (74.0)	56 (82.4)	310 (80.3)	
3	145 (8.7)	28 (5.0)	67 (10.1)	8 (11.8)	42 (10.9)	
≥ 4	206 (12.3)	63 (11.2)	105 (15.9)	4 (5.9)	34 (8.8)	
<b>Childhood environment</b>						< 0.001
Inner city, urban or suburban	1051 (63.0)	317 (56.5)	428 (64.9)	30 (47.6)	276 (71.7)	
Small town	280 (16.8)	107 (19.1)	93 (14.1)	15 (23.8)	65 (16.9)	
Rural, remote or isolated	234 (14.0)	92 (16.4)	96 (14.6)	15 (23.8)	31 (8.1)	
Mixed	103 (6.2)	45 (8.0)	42 (6.4)	3 (4.8)	13 (3.4)	

Note: The following numbers of residents offered no response or preferred not to answer certain questions: 34 for sex/gender, 61 for place of MD training, 90 for age, 4 for time since completion of MD training and 12 for childhood environment.  
\*Calculated with  $\chi^2$  test.

**Table 2: Practice intentions of family medicine residents exiting residencies in 2016 and 2017 who responded to the Family Medicine Longitudinal Survey, by region**

Intention	No. (%) of respondents					p value*
	Total	Ontario	Western Canada	Atlantic Canada	Quebec	
<b>Comprehensive care and confidence in current ability</b>						
Residents reporting that it was somewhat or highly likely that they would commit to providing comprehensive care to the same group of patients in their first 3 years of practice (Q17, n = 1652)	1095 (66.3)	474 (85.1)	401 (61.2)	27 (40.3)	193 (51.7)	< 0.001
Residents reporting that they agreed or strongly agreed with this statement: "I am confident in my current ability to provide comprehensive care to the same group of patients over time." (Q19, n = 1658)	1529 (92.2)	509 (91.2)	609 (93.4)	55 (82.1)	356 (93.4)	0.006
<b>Residents reporting it was somewhat or highly likely they would practise in the following organizational models in their first 3 years of practice</b>						
Comprehensive care delivered in 1 clinical setting (e.g., office based) (Q16a, n = 1659)	1019 (61.4)	320 (57.5)	416 (63.7)	32 (47.8)	251 (65.7)	0.004
Comprehensive care provided across multiple clinical settings (in-hospital, long-term care, office) (Q16b, n = 1661)	1261 (75.9)	437 (78.0)	504 (77.2)	56 (83.6)	264 (69.3)	0.004
Comprehensive care that includes a special interest (sports medicine, emergency medicine, palliative care, etc.) (Q16c, n = 1661)	1122 (67.6)	372 (66.6)	451 (69.1)	49 (73.1)	250 (65.5)	0.4
Practice focused only on specific clinical areas (e.g., sports medicine, maternity care, emergency medicine, palliative care, hospital medicine) (Q16d, n = 1658)	522 (31.5)	225 (40.3)	179 (27.5)	18 (26.9)	100 (26.3)	< 0.001
Solo practice (Q15a, n = 1645)	126 (7.7)	25 (4.6)	59 (9.1)	8 (12.1)	34 (9.0)	0.007
Group physician practice (Q15b, n = 1658)	1556 (93.8)	536 (96.2)	615 (94.0)	60 (90.9)	345 (90.6)	0.003
Interprofessional team-based practice (Q15c, n = 1656)	1459 (88.1)	520 (93.7)	561 (85.9)	59 (89.4)	319 (83.5)	< 0.001
Practice that includes teaching health profession learners (Q15d, n = 1652)	1293 (78.3)	370 (66.9)	566 (86.8)	53 (79.1)	304 (80.0)	< 0.001
<b>Residents reporting it was somewhat or highly likely they would provide care in the following clinical domains in their first 3 years of practice</b>						
Care across the life cycle (Q21a, n = 1658)	1506 (90.8)	515 (92.1)	594 (91.0)	56 (83.6)	341 (90.0)	0.1
Intrapartum care (Q21b, n = 1654)	623 (37.7)	174 (31.2)	276 (42.5)	28 (41.8)	145 (38.3)	0.001
Mental health care (Q21c, n = 1654)	1467 (88.7)	484 (86.7)	587 (90.3)	60 (89.6)	336 (88.7)	0.3
Chronic disease management (Q21d, n = 1650)	1541 (93.4)	513 (92.1)	618 (94.8)	59 (90.8)	351 (93.4)	0.2
Palliative care, end-of-life care (Q21e, n = 1653)	1060 (64.1)	276 (49.6)	483 (74.1)	48 (72.7)	253 (66.8)	< 0.001
Office-based clinical procedures (Q21f, n = 1649)	1382 (83.8)	435 (78.4)	585 (90.0)	52 (78.8)	310 (82.0)	< 0.001
In-hospital clinical procedures (e.g., chest tube insertion, adult lumbar puncture, nasogastric tube insertion) (Q21g, n = 1655)	646 (39.0)	193 (34.6)	296 (45.5)	24 (35.8)	133 (35.1)	< 0.001
<b>Residents reporting it was somewhat or highly likely they would provide care in the following practice settings or to the following populations in their first 3 years of practice</b>						
In emergency departments (Q21h, n = 1656)	693 (41.8)	194 (34.8)	324 (49.7)	32 (47.8)	143 (37.7)	< 0.001
In hospital (Q21i, n = 1653)	983 (59.5)	315 (56.7)	430 (66.0)	49 (74.2)	189 (49.9)	< 0.001
In the home (Q21j, n = 1654)	695 (42.0)	176 (31.6)	298 (45.8)	35 (52.2)	186 (49.1)	< 0.001
In long-term care facilities (Q21k, n = 1655)	678 (41.0)	169 (30.3)	344 (52.8)	27 (40.3)	138 (36.4)	< 0.001
Marginalized, disadvantaged and vulnerable populations (Q21l, n = 1652)	873 (52.8)	177 (31.9)	449 (69.0)	43 (64.2)	204 (53.8)	< 0.001
Rural populations (Q21m, n = 1577)	852 (54.0)	252 (45.2)	383 (58.7)	46 (68.7)	171 (57.2)	< 0.001
Elderly populations (Q21n, n = 1576)	1425 (90.4)	480 (86.0)	607 (93.0)	62 (92.5)	276 (92.6)	< 0.001
First Nations, Inuit and Métis (Q21o, n = 1656)	694 (41.9)	121 (21.7)	422 (64.6)	22 (32.8)	129 (34.0)	< 0.001

\*Calculated with  $\chi^2$  test.



Two-thirds of respondents (67.6%,  $n = 1122$ ) indicated that they intended to have a comprehensive practice that included a special interest (Table 2), with no significant variation among regions (Appendix 2). Almost a third of respondents (31.5%,  $n = 522$ ) indicated it was somewhat or highly likely that they would plan to focus only on specific clinical areas (Table 2). The odds of focused practice were highest in Ontario (Appendix 2).

Few respondents (7.7%) indicated it was somewhat or highly likely they would work in a solo practice, while 93.8% and 88.1% of respondents reported they were somewhat or highly likely to work in a group physician practice and with interprofessional teams, respectively (Table 2). Relative to respondents from Ontario, respondents from the other regions had higher odds of intending to work in a solo practice and lower odds of intending to work in a group physician practice or interprofessional team (Appendix 2). Intentions to have a practice that included teaching health professional learners were lowest in Ontario (66.9%,  $n = 370$ ) and highest in Western Canada (86.8%,  $n = 566$ ) (Table 2). In multivariable analysis, relative to respondents from Ontario, respondents from all other regions had significantly higher odds of intending to pursue a practice that included teaching (Appendix 2).

### Clinical domains of practice

We did not detect significant variation in intentions to provide care across the life cycle or to provide mental health care or chronic disease management (Table 2). Respondents from Ontario were less likely to report intentions to provide intrapartum and palliative care. Residents from Western Canada were more likely to report intentions to provide office-based clinical procedures.

### Practice settings and populations

With respect to practice settings, nationally 42.0% ( $n = 695$ ) of respondents reported that they intended to provide care in the home and 41.0% ( $n = 678$ ) indicated that they intended to provide care in long-term care facilities. In Ontario these percentages were only 31.6% ( $n = 176$ ) and 30.3% ( $n = 169$ ), respectively (Table 2). Just over half (52.8%,  $n = 852$ ) of physicians intended to provide care to marginalized, disadvantaged and vulnerable populations, and 41.9% ( $n = 694$ ) intended to provide care to First Nations, Inuit and Métis peoples. The odds of intending to have a practice serving marginalized populations and First Nations, Inuit and Métis peoples were lowest for Ontario respondents and highest for respondents from Western Canada (Appendix 2).

### Sensitivity analysis

Sensitivity analyses confirmed that our results did not change given different analytic choices. Grouping “neutral” responses with “somewhat unlikely” and “highly unlikely” responses versus “somewhat likely” and “highly likely” responses, including the number of years since the respondent obtained their medical degree instead of the respondent’s age, and excluding intentions for rural practice resulted in only very small changes in parameter estimates for regions.

### Interpretation

Intentions to provide comprehensive care differed markedly across regions and did not appear to correspond to family medicine residents’ confidence in their clinical ability (Table 2). These differences persisted when we adjusted for demographic variables and intentions for rural practice (Appendix 2). Almost a third of respondents (31.5%,  $n = 522$ ) indicated that they were somewhat or highly likely to have a practice focused only on specific clinical areas. Over 80% of respondents across all regions expressed the intention to provide interprofessional, team-based care.

Differences in practice intentions among regions may reflect differences in the organization of primary care. For instance, in Ontario most family physicians work in a model of group physician or interdisciplinary team-based practice,<sup>24</sup> whereas in Quebec, Atlantic Canada and Western Canada, supports for interdisciplinary practice are developing but have been more limited in scope.<sup>8–10</sup> Ontario family medicine residents were most likely to report that they intended to provide comprehensive care to the same group of patients for their first 3 years of practice, but they were the least likely to report that they intended to provide the full range of services. Team-based models may mean individual physicians can pursue focused practice while still contributing to comprehensive care for patients. In contrast, in Atlantic Canada, a higher proportion of respondents intended to provide care across multiple clinical settings and to rural populations.

Our results offer preliminary insight for policy and workforce planning. The finding that one-third of family medicine residents did not anticipate providing comprehensive primary care when they entered practice (Table 2) suggests workforce planning approaches that do not account for scope may overestimate the supply of individual physicians delivering comprehensive care.<sup>5</sup> Models of primary care that integrate focused practice within a team whose members together deliver comprehensive services should be considered.<sup>25</sup> Approximately half of family medicine residents in our study indicated that they intended to provide care to marginalized, disadvantaged, vulnerable or Indigenous populations. As with other intentions to practice, this intention is probably influenced by the residents’ values and/or training experience and may signal gaps in terms of who is recruited into medicine and the training contexts that these residents choose or are placed in. That over 80% of family medicine residents expressed intentions to provide interdisciplinary team-based care in all regions probably reflects the fact that team-based care is a focus of medical training at all Canadian medical schools;<sup>26</sup> however, opportunities for team-based practice may not match this demand.<sup>10</sup> Policy-makers and workforce planners should consider the impact of family medicine residents’ intentions on policy objectives.

### Limitations

Although response rates to this survey were high compared with those to other physician surveys<sup>27,28</sup> and the demographic

characteristics of the respondents appeared to be similar to those of residents in the Canadian Post-MD Education Registry, it is plausible that respondents and nonrespondents differed with respect to practice intentions. It is also possible that the perceived desirability of comprehensive family practice may have biased respondents and led to overreporting of intentions for comprehensive practice. In addition, the survey questions were not validated and no definitions of terms like comprehensive care were provided in the survey, and respondents may have interpreted terms differently across regions. For example, some respondents may have interpreted “comprehensive care in 1 clinical setting” as including locums or walk-in style practice. Furthermore, categorization of the Likert responses for analysis resulted in loss of information. We also had no information on respondents’ province or medical school and so could not examine policy environments specific to each province nor adjust for characteristics unique to each training program in the models. We could observe only location of training, not region of subsequent practice, and so we could not observe practice intentions among family medicine residents likely to practise in the territories or in provinces other than where they trained. We have no information about how payment models shape practice intentions from this survey, but there is evidence that payment models may shape practice choice<sup>11–14</sup> and evidence that early-career primary care physicians may prefer non-fee-for-service models of compensation.<sup>29</sup> The impacts of misalignment between aspirational practice intentions of graduating family physicians and actual opportunities for team-based practice are not known. Finally, it is unknown whether our study’s findings are unique to the current cohort of family medicine residents or whether they reflect changing practice intentions, and potentially changes in actual practice, among physicians of all ages. We performed multiple comparisons to explore family medicine residents’ intentions to practice and as such our study should be considered preliminary and descriptive. Although some significant findings could be spurious, large differences in practice intentions signal areas for further exploration by health policy researchers and health human resources planners.

## Conclusion

If intentions to focus only on specific clinical areas translate into practice, changes to the organization of primary care that integrate focused practice within comprehensive teams and/or changes to workforce planning may be needed to ensure access to comprehensive care. The findings that most family medicine residents intend to practise in group physician or interdisciplinary team-based organizational models could prompt consideration of whether practice opportunities are in line with these expectations across all regions. Further research is needed to determine whether practice intentions correspond to actual practice and to better understand what additional factors shape the choices family physicians make as they navigate the early stages of their careers.

## References

1. *Physicians in Canada, 2016: summary report*. Ottawa: Canadian Institute for Health Information; 2017:1–27. Available: [https://www.cihi.ca/sites/default/files/document/physicians\\_in\\_canada\\_phys2016\\_en.pdf](https://www.cihi.ca/sites/default/files/document/physicians_in_canada_phys2016_en.pdf) (accessed 2018 June 18).
2. *CANSIM Table 105-0501 — Health indicator profile, annual estimates by age group and sex, Canada, provinces, territories, health regions (2013 boundaries) and peer groups*. 2008–2011. Ottawa: Statistics Canada. Available: <http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=1050501> (accessed 2016 Jan. 13).
3. *How Canada compares: results from The Commonwealth Fund 2015 International Health Policy Survey of Primary Care Physicians*. Ottawa: Canadian Institute for Health Information; 2016. Available: [https://www.cihi.ca/sites/default/files/document/commonwealth\\_fund\\_2015\\_pdf\\_en.pdf](https://www.cihi.ca/sites/default/files/document/commonwealth_fund_2015_pdf_en.pdf) (accessed 2018 Oct. 9).
4. *How Canada compares: results from The Commonwealth Fund’s 2016 International Health Policy Survey of Adults in 11 Countries*. Ottawa: Canadian Institute for Health Information; 2017. Available: <https://www.cihi.ca/en/health-system-performance/performance-reporting/international/wait-times-for-primary-and-specialist>. (accessed 2018 Oct. 9).
5. Hedden L, Barer ML, McGrail K, et al. In British Columbia, the supply of primary care physicians grew, but their rate of clinical activity declined. *Health Aff (Millwood)* 2017;36:1904–11.
6. Chan BTB. The declining comprehensiveness of primary care. *CMAJ* 2002;166:429–34.
7. Lavergne MR, Peterson S, McKendry R, et al. Full-service family practice in British Columbia: policy interventions and trends in practice, 1991–2010. *Health Policy* 2014;9:32–47.
8. Strumpf E, Levesque J-F, Coyle N, et al. Innovative and diverse strategies toward primary health care reform: lessons learned from the Canadian experience. *J Am Board Fam Med* 2012;25(Suppl 1):S27–33.
9. Aggarwal M, Hutchison B. *Toward a primary care strategy for Canada*. Ottawa: Canadian Foundation for Healthcare Improvement; 2012. Available: <https://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&uact=8&ved=0ahUKEwip4ZzX-4fMAhWLHR4KHRGtB0lQFggzMAQ&url=http://www.cfhi-fcass.ca/Libraries/Reports/Primary-Care-Strategy-EN.sflb.ashx&usq=AFQjCNGuSzzp0NwAyQetXPvVdE2OOffjoA> (accessed 2018 Nov. 13).
10. Peckham A, Ho J, Marchildon G. *Policy innovations in primary care across Canada: a rapid review prepared for the Canadian Foundation for Health Innovation*. Toronto: North American Observatory on Health Systems and Policies; 2018.
11. McGuire TG. Physician agency and payment for primary medical care. *Oxford Handb Heal Econ* 2011;602–23.
12. Leger P. Physician payment mechanisms. In: *Financing health care*. Weinheim, (Germany): Wiley-VCH Verlag GmbH & Co. KGaA; 2007:149–76.
13. Gosden T, Forland F, Kristiansen IS, et al. Capitation, salary, fee-for-service and mixed systems of payment: effects on the behaviour of primary care physicians. *Cochrane Database Syst Rev* 2011;(3):CD002215.
14. Gosden T, Forland F, Kristiansen I. Impact of payment method on behaviour of primary care physicians: a systematic review. *J Health Serv Res Policy* 2001;6:44–55.
15. Kiolbassa K, Miksch A, Hermann K, et al. Becoming a general practitioner — Which factors have most impact on career choice of medical students? *BMC Fam Pract* 2011;12:25.
16. Connelly MT, Sullivan AM, Peters AS, et al. Variation in predictors of primary care career choice by year and stage of training. *J Gen Intern Med* 2003;18:159–69.
17. Scott I, Wright B, Brenneis F, et al. Why would I choose a career in family medicine? Reflections of medical students at 3 universities. *Can Fam Physician* 2007;53:1956–7.
18. Bennett KL, Phillips JP. Finding, recruiting, and sustaining the future primary care physician workforce: a new theoretical model of specialty choice process. *Acad Med* 2010;85:S81–8.
19. Oandasan IF, Archibald D, Authier L, et al. Future practice of comprehensive care: Practice intentions of exiting family medicine residents in Canada. *Can Fam Physician* 2018;64:520–8.
20. Grierson LEM, Fowler N, Kwan MYW. Family medicine residents’ practice intentions: theory of planned behavior evaluation. *Can Fam Physician* 2015;61:e524–31.
21. Oandasan I, Saucier D, editors. A national program evaluation approach to study the impact of Triple C. In: *Triple C competency-based curriculum report — part 2: advancing implementation*. Mississauga (ON): College of Family Physicians of Canada; 2013. Available: [www.cfpc.ca/uploadedFiles/Education/\\_PDFs/\\_TripleC\\_Report\\_pt2.pdf](http://www.cfpc.ca/uploadedFiles/Education/_PDFs/_TripleC_Report_pt2.pdf) (accessed 2018 Nov. 14).
22. Family Medicine Longitudinal Survey: T2 (exit) results 2016. Aggregate data for 16 participating programs. Family medicine residency programs. Mississauga (ON): College of Family Physicians of Canada; 2016.
23. Walton M, Rourke J, Bowmer I, et al. 2016–2017 *Annual census of post-M.D. trainees*. Ottawa: CAPER[Canadian Post-M.D. Education Registry]-RCEP; 2017. Available: [https://caper.ca/~assets/documents/2016-17\\_CAPER\\_Census\\_en.pdf](https://caper.ca/~assets/documents/2016-17_CAPER_Census_en.pdf) (accessed 2018 July 4).
24. Hutchison B, Glazier R. Ontario’s primary care reforms have transformed the local care landscape, but a plan is needed for ongoing improvement. *Health Aff (Millwood)* 2013;32:695–703.
25. Contandriopoulos D, Perroux M, Cockenpot A, et al. Analytical typology of multiprofessional primary care models. *BMC Fam Pract* 2018;19:44.
26. *A collective vision for postgraduate medical education in Canada*. Ottawa: The Association of Faculties of Medicine of Canada; 2012.

27. Cunningham CT, Cai P, Topps D, et al. Mining rich health data from Canadian physician claims: features and face validity. *BMC Res Notes* 2014;7:682.
28. Kellerman SE, Herold J. Physician response to surveys: a review of the literature. *Am J Prev Med* 2001;20:61-7.
29. Brcic V, McGregor M, Kaczorowski J. Practice and payment preferences of newly practising family physicians in British Columbia. *Can Fam Physician* 2012;58:275-81.

**Affiliations:** Faculty of Health Sciences (Lavergne, Goldsmith, Hedden), Simon Fraser University, Burnaby, BC; Department of Family Practice (Scott, Mitra), Faculty of Medicine, University of British Columbia, Vancouver, BC; Department of Family Practice (Snadden), Faculty of Medicine, University of British Columbia Northern Medical Program, Prince George, BC; School of Leadership Studies (Blackie), Royal Roads University, Victoria, BC; University of Ontario Institute of Technology (Rudoler), Oshawa, Ont.; Telfer School of Management (Grudniewicz), University of Ottawa, Ottawa, Ont.; Centre for Health Services and Policy Research (Ahuja), School of Population and Public Health, University of British Columbia, Vancouver, BC; Department of Family Medicine (Marshall), Faculty of Medicine, Dalhousie University, Halifax, NS

**Contributors:** Ruth Lavergne completed the statistical analysis and led the drafting of the manuscript. All other authors contributed to the study design and revised the manuscript for important intellectual content. All authors gave final approval of the version to be published and agreed to act as guarantors of the work.

**Funding:** This study was supported by the Canadian Institutes of Health Research (project grant no. 155965).

**Acknowledgements:** The authors would like to acknowledge the College of Family Physicians of Canada and the 17 university-based family medicine residency programs who have partnered to evaluate the Triple C competency-based curriculum, which provided the survey data used in this publication. The views and opinions expressed in this paper do not necessarily reflect the views of the College of Family Physicians of Canada or the universities.

**Supplemental information:** For reviewer comments and the original submission of this manuscript, please see [www.cmajopen.ca/content/7/1/E124/suppl/DC1](http://www.cmajopen.ca/content/7/1/E124/suppl/DC1).