



## Provision of Government-funded and Pro Bono Dental Care: Are There Gender Differences?

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### ABSTRACT

**Background:** Government-funded and pro bono dental care are important to populations with limited means. At the same time, dentistry is experiencing a gender shift in the practising profession. As a result, we aimed to determine the factors associated with the provision of government-funded and pro bono dental care and whether there are gender differences.

**Methods:** We conducted a secondary data analysis of the results of a 2012 survey of a representative sample of Ontario dentists. Descriptive, bivariate and multivariable analyses were carried out.

**Results:** The 867 survey respondents represented a 28.9% response rate. On average, Ontario dentists reported that 15.7% of their practice consisted of government-funded patients and they provided \$2242 worth of pro bono care monthly. Male and female dentists reported similar levels of both ( $p > 0.05$ ). Being a practice owner and having more pediatric patients influenced levels of government-funded patients. Being internationally trained, of European ethnicity, single, and income status affected levels of monthly pro bono care. Gender-stratified analysis revealed that, among female dentists, household responsibilities was a unique factor associated with the proportion of government-funded patients, as was international training, personal income and ethnic origin for levels of pro bono care.

**Conclusion:** Overall, male and female dentists are similar in the provision of government-funded and pro bono care, but various factors influence levels of each in both groups.

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**D**entists act as stewards in the provision of dental care to the community at large. As such, delivery of dental care to those with low socioeconomic status is, in part, dependent on dentists' acceptance and adoption of government-funded dental programs and the provision of pro bono care.

In 2009, an estimated 7.6% of Canadian dentists had practices primarily treating publicly insured patients.<sup>1</sup> About 70% of practices included < 10% publicly insured patients.<sup>1</sup> In general, long-standing complaints from dentists about government-funded programs include low remuneration, high administrative burden, constrained clinical decision-making and low patient compliance.<sup>1,2</sup>

Canadian dentists also provide pro bono care to those in need.<sup>1,3</sup> For 16.7%, this amounts to > \$1000/month, for 72.8%, < \$1000/month and 8.1% of dentists report no pro bono work.<sup>1</sup> As a policy instrument to improve access to care, facilitating dentists' willingness to provide more pro bono care through tax incentives has been suggested, an idea supported by approximately 69% of Canadian dentists.<sup>1</sup>

Although research has shed light on some of the factors that are associated with dentists' participation in government-funded programs, almost nothing is known about what influences pro bono care.<sup>1</sup> At the same time, much like medicine, pharmacy and law, dentistry has experienced an influx of women in an otherwise historically male-dominated profession.<sup>4,5</sup> The shift toward more women in the dental workforce is a relatively recent phenomenon and, thus, there are few Canadian studies investigating what this may mean for the profession and dental care delivery.<sup>6-8</sup> What literature exists suggests that, when compared with male dentists, female dentists are more likely to be generalists than specialists, retire at an earlier age, spend more time interacting with patients and refer patients to specialists.<sup>6</sup> Two recent Canadian studies demonstrated that female dentists work marginally fewer hours per week and are less likely to be practice owners.<sup>7,8</sup> These outcomes appear to be gendered, meaning they are, in part, predicted by such things as spousal/partner support for family responsibilities, including child care and household chores and spousal/partner career concessions.<sup>7,8</sup>

Given that certain aspects of dentistry are associated with gender differences based on previous studies,<sup>4-8</sup> we aimed to determine whether there are factors associated with the provision of government-funded and pro bono dental care among Ontario dentists, and whether there are gender differences. Studying these phenomena can help us understand dentist practice patterns and what potential correlates affect these patterns.

## Methods

### Study Design and Data Collection

This study is a secondary data analysis of a cross-sectional survey of practising dentists in Ontario, which was completed in 2012. The participants were selected through random sampling of the 8398 registered dentists in Ontario found in the 2010 Royal College of Dental Surgeons of Ontario listing. The original objective of the survey was to analyze differences between male and female dentists on personal and professional issues through a 52-item questionnaire. A list of the questions from that survey relevant to this study can be found in **Appendix 1**, and further description of the study design, sampling and survey instrument is provided elsewhere.<sup>7,8</sup>

In brief, an initial sample size of 941 dentists was determined based on a conservative measure of variation in response to questions (50/50 split), a 95% confidence interval and 3% sampling error. This sample size was tripled to 3000. The sampling frame was stratified by gender, with a random start systematic sample drawn from each stratum (1500 men, 1500 women). A single mail-out was completed. The survey was approved by the University of Toronto's Office of Research Ethics (protocol reference #27977), as was this secondary analysis (protocol reference #35607).

### Study Variables

The outcomes under study included the percentage of a dentist's patients covered by government-funded dental programs and the amount of monthly pro bono work provided (in Canadian dollars). Both pieces of information were ascertained from specific questions in the survey (see **Appendix 1**) asking dentists to provide a numerical value in response. We treated dentists' responses as continuous variables.

Potential correlates were selected from the survey, a priori, based on hypothesized relations with the outcomes, in addition to factors that are linked to the outcomes in the literature. We grouped these variables into 4 distinct categories: personal (e.g., age, gender, income), family (e.g., marital status, children), practice (e.g., location, ownership status, number of staff) and professional (e.g., year of graduation, location of initial dental training, hours worked per week).

### Data Analysis

Data analysis was undertaken using SPSS, v. 21.0 (IBM Corporation, Armonk, New York, USA). All variables were compared between males and females using Student's *t* test for continuous variables and  $\chi^2$  tests for categorical variables. A bivariate analysis was used to determine potentially significant factors affecting the reported

percentage of government-funded patients and monthly amounts of pro bono care. Variables showing an association at  $p < 0.15$  in the bivariate analysis were included in the multivariable regression. Multivariable linear regression was then used to determine the dominant predictors. Stratified analyses (male and female) undertaking the above process were also conducted to determine qualitatively whether there are gender differences in the potential correlates.

## Results

The 867 survey respondents included 463 men, 401 women and 3 who did not report a gender. This represented a 28.9% response rate. Details of the sample population are provided in **Table 1**.

### Government-funded patients

On average, Ontario dentists reported that 15.7% of their practice consisted of government-funded patients (**Table 2**). Male and female dentists reported similar percentages (15.4% and 16.0%, respectively,  $p > 0.05$ ).

Bivariate analysis of the whole sample showed the following characteristics to be significantly associated with higher reported levels of government-funded patients: being a specialist, practice ownership, relationship status (married), equal caregiver status with spouse, household responsibilities, higher percentage of pediatric patients and planned retirement age (**Table 3**). Among male dentists only, the following characteristics were significantly associated with reported levels of government-funded patients: age (+0.2%), graduation year (−0.2%), being a specialist (+5.1%), number of staff (+0.3% with each increase in staff), practice ownership (−12.0%), relationship status (single +18.5%, married +2.5%, divorced +2.9%), caregiver status (spouse −5.7%, equal +0.04%, other +2.0%), percentage of pediatric patients (+0.2% for each 1% increase in pediatric patients treated) and planned retirement age (+0.4% for each 1-year increase in retirement year). For female dentists, it was: age (−0.2%), graduation year (+0.3%), practice ownership (−9.9%), responsibility for household chores (spouse −6.1%, equal −1.6%, paid −8.5%) and percentage of pediatric patients (+0.3% for each 1% increase in pediatric patients treated).

Multivariable analysis of the whole sample (**Table 4**) showed that practice owners had 7.0% fewer government-funded patients, and dentists in non-married relationships had 26.1% more government-funded patients. For each 1% increase in pediatric patients, there was a 0.2% increase in government-funded patients. For male dentists only, practice owners had 23.8% fewer government-funded patients, and for each 1% increase in pediatric patients, there was a 0.2% increase in government-funded patients. For female dentists only, practice owners had 8.4% fewer government-funded patients. Those who had hired someone to do household chores had 7.1%

fewer government-funded patients. For each 1% increase in pediatric patients, there was a 0.2% increase in government-funded patients.

### Pro bono care

On average, Ontario dentists reported providing \$2242 worth of pro bono care every month (**Table 5**). Male and female dentists reported similar amounts (\$2284 and \$2190, respectively,  $p > 0.05$ ).

Bivariate analysis of the whole sample (**Table 6**) showed that the following characteristics were significantly associated with reported amounts of monthly pro bono care: location of initial dental training, the number of hours worked per week, relationship status, personal annual income and ethnic origin. Internationally trained dentists reported providing \$3110 more monthly pro bono care than domestically trained dentists. For every increase in hours worked per week, dentists provided \$76 more monthly pro bono care. When compared with single dentists, those who were in a non-married relationship, married and divorced reported providing \$3481, \$2563 and \$3530 less monthly pro bono care, respectively. Compared with dentists earning < \$100 thousand/year, those who earned \$100–200 thousand/year reported providing \$1998 more monthly pro bono care. Dentists earning > \$200 thousand/year reported providing \$705 more monthly pro bono care than dentists earning < \$100 thousand/year. Compared with dentists characterizing their ethnic origin as Canadian, those of Chinese, European and south Asian ethnicities reported providing \$980, \$2235, \$2566 more monthly pro bono care, respectively.

Among male dentists only, the following characteristics were significantly associated with reported amounts of monthly pro bono care: age (−\$49.48 with each increase in year of age), year of graduation (+\$44.79 with each increase in graduation year), hours worked per week (+\$97.70 with each additional hour) and spousal annual income (+\$2409.70 of pro bono work if their spouse makes less than \$100 thousand/year). For female dentists, it was: location of initial dental training (internationally trained provided +\$4680.99 per month compared with domestically trained dentists), personal annual income (compared with those making < \$100 thousand/year, those making \$100–200 thousand/year reported providing \$2143 more pro bono work and those making > \$200 thousand/year reported providing \$382 more pro bono work) and ethnic background (compared with Canadian dentists, those with a Chinese, European, South Asian and other ethnic origin reported providing \$927, \$4117, \$3462 and \$96 more monthly pro bono care, respectively).

Multivariable analysis (**Table 7**) revealed that internationally trained dentists reported providing \$2641 more monthly pro bono care than domestically trained dentists. Dentists of European ethnicity reported providing \$2209 more monthly pro bono care compared with dentists of Canadian ethnicity. When compared with single dentists,

**Table 1:** Personal, family, practice and professional characteristics of respondents.

Variable	All respondents (n = 864)		Male dentists (n = 463)		Female dentists (n = 401)		p
	Mean or proportion	SD	Mean or proportion	SD	Mean or proportion	SD	
<b>Personal</b>							
Gender	0.46 (female)	0.50					
Age	49.21	10.68	52.60	10.80	45.35	9.15	< 0.001
<b>Ethnic origin (reference: Canadian)</b>							
Chinese	0.10	0.30	0.08	0.27	0.12	0.32	0.07
European	0.15	0.35	0.12	0.32	0.18	0.39	0.01
South Asian	0.10	0.30	0.07	0.25	0.14	0.34	< 0.001
Other	0.10	0.30	0.09	0.29	0.10	0.30	0.76
<b>Relationship status (reference: single)</b>							
Non-married relationship	0.05	0.21	0.03	0.18	0.06	0.25	0.29
Married	0.84	0.37	0.87	0.34	0.80	0.40	0.01
Divorced/separated	0.06	0.23	0.06	0.24	0.05	0.23	0.72
<b>Family</b>							
Annual spousal income > \$100K (reference: < \$100K)	0.22	0.41	0.17	0.38	0.28	0.45	< 0.001
<b>Household chores (reference: dentist)</b>							
Spouse	0.25	0.43	0.39	0.49	0.09	0.28	< 0.001
Equal between spouse and dentist	0.40	0.49	0.42	0.49	0.37	0.48	0.12
Paid	0.10	0.30	0.08	0.28	0.12	0.33	0.69
<b>Caregiver roles (reference: dentist)</b>							
Spouse	0.22	0.42	0.34	0.47	0.07	0.26	< 0.001
Equal between spouse and dentist	0.39	0.49	0.30	0.46	0.50	0.50	< 0.001
Paid	0.20	0.40	0.25	0.43	0.14	0.35	< 0.001
<b>Number of children (reference: no children)</b>							
1–2 children	0.53	0.50	0.51	0.50	0.56	0.50	0.14
3+ children	0.30	0.46	0.38	0.48	0.22	0.42	< 0.001
<b>Practice</b>							
Practice owner (reference: associate)	0.76	0.43	0.82	0.38	0.68	0.47	< 0.001
<b>Population at practice location (reference: small 1000–29 999)</b>							
Large (≥ 100 000)	0.72	0.45	0.70	0.46	0.74	0.44	0.16
Medium (30 000–99 999)	0.14	0.35	0.15	0.36	0.14	0.35	0.77
Number of staff in office	6.69	5.61	7.31	6.00	5.90	5.00	< 0.001
Percent pediatric patients in practice	20.49	19.19	17.58	17.49	23.87	20.51	< 0.001

Table 1 continued ►

Variable	All respondents (n = 864)		Male dentists (n = 463)		Female dentists (n = 401)		p
	Mean or proportion	SD	Mean or proportion	SD	Mean or proportion	SD	
<b>Professional</b>							
Internationally trained (reference: domestically trained)	0.20	0.40	0.14	0.35	0.27	0.45	< 0.001
Graduation year	1988.87	11.35	1985.34	11.40	1992.98	9.80	< 0.001
Specialist (reference: general practitioner)	0.14	0.35	0.17	0.37	0.11	0.32	0.02
Hours worked/week	36.15	9.68	37.08	9.38	35.01	9.89	< 0.001
Academically affiliated (reference: no)	0.07	0.25	0.07	0.25	0.07	0.25	0.93
<b>Annual income (reference: &lt; \$100K)</b>							
\$100–\$200K	0.40	0.49	0.31	0.46	0.50	0.60	< 0.001
> \$200K	0.51	0.50	0.62	0.49	0.37	0.48	< 0.001
Stress in work-life balance (scale of 1 to 5)	2.80	1.21	2.58	1.18	3.06	1.21	< 0.001
Planned age of retirement	63.15	5.62	64.70	5.43	61.34	5.27	< 0.001
<i>Note: SD = standard deviation.</i>							

**Table 2:** Percentage of government-funded patients in Ontario dentists' practices.

	All respondents (n = 864)	Male dentists (n = 463)	Female dentists (n = 401)
<b>Mean</b>	15.66	15.35	16.04
<b>Median</b>	10.00	10.00	10.00
<b>Mode</b>	10.00	5.00	10.00
<b>Minimum</b>	0.00	0.00	0.00
<b>Maximum</b>	100.00	100.00	100.00
<b>Standard deviation</b>	20.94	20.95	20.96
<b>1st quartile</b>	5.00	5.00	5.00
<b>3rd quartile</b>	20.00	15.00	20.00

**Table 3:** Bivariate analysis of factors associated with the relative percentage of government-funded patients within Ontario dental practices

Variable	All respondents (n = 864)			Male dentists (n = 463)			Female dentists (n = 401)		
	$\beta$	SE	p	$\beta$	SE	p	$\beta$	SE	p
Gender (reference: male)	0.71	1.49	0.63						
Age (continuous)	0.04	0.07	0.60	0.23	0.09	0.02	-0.24	0.12	0.05
Internationally trained (reference: domestically trained)	0.02	1.89	0.99	-0.97	2.95	0.74	0.43	2.52	0.87
Graduation year (continuous)	0.00	0.07	1.00	-0.17	0.09	0.07	0.26	0.12	0.02
Specialist (reference: generalist)	4.25	2.19	0.05	5.09	2.78	0.07	3.14	3.56	0.38
Hours worked/week (continuous)	-0.03	0.08	0.73	-0.12	0.11	0.26	0.08	0.11	0.45
Number of staff (continuous)	-0.16	0.14	0.25	-0.26	-0.08	0.13	0.03	0.23	0.89
Practice owner (reference: associate)	-10.63	1.69	<0.001	-11.95	2.60	<0.01	-9.90	2.29	<0.01
Academically affiliated (reference: no)	-2.20	3.18	0.49	-4.86	4.32	0.26	0.98	4.71	0.84
Population at practice location (reference: small 1000–29 999)									
Large ( $\geq$ 100 000)	0.22	2.17	0.93	-0.99	2.83	0.86	1.78	3.41	0.87
Medium (30 000–99 999)	0.96	2.81	0.93	0.42	3.69	0.86	1.78	4.35	0.87
Relationship status (reference: single)									
Non-married	9.70	4.57	0.01	18.50	7.31	0.02	4.19	5.88	0.16
Married	2.00	3.31	0.01	2.52	5.28	0.02	-4.72	4.29	0.16
Divorced	-0.33	4.49	0.01	2.85	6.62	0.02	-1.29	6.33	0.16
Annual income (reference: < \$100K)									
\$100–\$200K	0.64	2.68	0.27	-1.98	4.27	0.51	2.33	3.49	0.51
> \$200K	-1.92	2.62	0.27	-3.86	4.07	0.51	-0.42	3.63	0.51
Spousal income > \$100K	-0.14	1.92	0.94	-0.15	2.84	0.96	-0.27	2.66	0.92
No. children (reference: none)									
1–2	0.23	2.07	0.96	-2.03	3.26	0.70	2.10	2.71	0.73
3+	0.58	2.25	0.96	-0.46	3.37	0.70	1.02	3.27	0.73
Main caregiver (reference: self)									
Spouse	-5.73	2.67	0.03	-5.67	4.02	0.01	-1.71	5.22	0.37
Equal spouse/dentist	0.22	2.43	0.03	0.04	4.06	0.01	0.63	3.13	0.37
Other	-0.27	2.67	0.03	2.88	4.12	0.01	-5.42	3.99	0.37
Household chores (reference: self)									
Spouse	-5.08	2.09	0.05	-3.41	3.45	0.27	-6.09	4.10	0.08
Equal spouse/dentist	-1.14	1.87	0.05	0.44	3.41	0.27	-1.63	2.45	0.08
Paid	-4.41	2.79	0.05	1.79	4.68	0.27	-8.53	3.63	0.08
Percent pediatric patients (continuous)	0.22	0.04	<0.001	0.17	0.06	<0.01	0.28	0.05	<0.01
Planned retirement age (continuous)	0.25	0.14	0.08	0.35	0.19	0.07	0.25	0.23	0.28
Stress in work-life balance (continuous)	-0.08	0.62	0.90	-0.82	0.87	0.35	0.56	0.92	0.54
Ethnic origin (reference: Canadian)									
Chinese	-5.42	2.57	0.20	-6.62	3.73	0.33	-4.52	3.62	0.64
European	1.47	2.20	0.20	-3.46	3.25	0.33	-0.09	3.08	0.64
South Asian	-1.04	2.52	0.20	-2.82	4.12	0.33	-0.25	3.30	0.64
Other	-3.99	2.59	0.20	-3.95	3.51	0.33	-4.11	3.86	0.64

Note: SE = standard error

**Table 4:** Multivariable analysis of factors associated with the relative percentage of government-funded patients within Ontario dental practices.

Variable	All respondents (n = 864)			Male dentists (n = 463)			Female dentists (n = 401)		
	$\beta$	SE	p	$\beta$	SE	p	$\beta$	SE	p
Age (continuous)				-0.21	0.56	0.71	-0.23	0.42	0.59
Graduation year (continuous)				-0.38	0.53	0.48	-0.17	0.40	0.67
Specialist (reference: generalist)	1.85	2.6	0.48	1.15	3.64	0.75			
No. staff (continuous)				-0.08	0.23	0.74			
Practice owner (reference: associate)	-6.97	2.19	< 0.01	-23.79	6.61	< 0.01	-8.43	2.42	< 0.01
Relationship status (reference: single)									
Non-married	26.13	9.22	0.01	21.30	13.60	0.12			
Married	4.85	7.73	0.53	1.15	11.47	0.92			
Divorced	3.89	8.53	0.65	-7.60	12.34	0.54			
Main caregiver (reference: self)									
Spouse	-5.18	3.21	0.11	-5.31	5.25	0.31			
Equal spouse/dentist	0.03	2.76	0.99	-1.45	5.14	0.78			
Other	-0.58	3.06	0.85	-0.21	5.15	0.97			
Household chores (reference: self)									
Spouse	-0.6	2.97	0.84				-1.00	4.12	0.81
Equal spouse/dentist	0.34	2.58	0.89				-1.00	2.40	0.68
Paid	-2.4	3.34	0.47				-7.12	3.62	0.05
Percent pediatric patients (continuous)	0.2	0.05	< 0.01	0.17	0.08	0.04	0.23	0.05	< 0.01
Planned retirement age (continuous)	0.27	0.16	0.09	0.24	0.28	0.40			
<i>Note: SE = standard error</i>									

**Table 5:** Amount of pro bono care (\$/month) provided by Ontario dentists.

	All respondents (n = 864)	Male dentists (n = 463)	Female dentists (n = 401)
Mean	2242.14	2283.89	2189.95
Median	750.00	1000.00	500.00
Mode	1000.00	1000.00	500.00
Minimum	0.00	0.00	0.00
Maximum	65000.00	60000.00	65000.00
Standard deviation	6639.21	6086.90	7282.11
1st quartile	300.00	400.00	200.00
3rd quartile	1500.00	2000.00	1000.00

**Table 6:** Bivariate analysis of factors associated with the amount of pro bono care (\$/month) provided by Ontario dentists.

Variable	All respondents (n = 864)			Male dentists (n = 463)			Female dentists (n = 401)		
	$\beta$	SE	p	$\beta$	SE	p	$\beta$	SE	p
Gender (reference: male)	21.25	33.72	0.97						
Age (continuous)	-19.61	26.31	0.46	-49.48	31.98	0.12	22.36	50.23	0.66
Internationally trained (reference: domestically trained)	3110.26	699.82	< 0.01	1345.02	972.83	0.17	4680.99	1026.34	< 0.01
Graduation year (continuous)	19.27	25.15	0.44	44.79	28.48	0.12	-23.38	51.22	0.65
Specialist (reference: generalist)	-665.26	777.58	0.39	-410.07	918.23	0.66	-1069.56	1358.72	0.43
Hours worked/week (continuous)	75.80	29.21	0.01	97.70	37.07	0.01	53.88	47.55	0.26
Numbers of staff (continuous)	-51.79	53.22	0.33	-10.43	61.57	0.87	-128.89	98.40	0.19
Practice owner (reference: associate)	-504.28	649.18	0.44	545.15	918.02	0.55	-1377.44	960.31	0.16
Academically affiliated (reference: no)	-1158.12	1138.11	0.31	-869.51	1518.50	0.57	-1409.33	1725.61	0.42
Population at practice location (reference: small 1000–29 999)									
Large ( $\geq$ 100 000)	-128.75	759.05	0.89	-281.97	904.01	0.81	167.63	1311.52	0.47
Medium (30 000–99 999)	254.41	1005.14	0.89	-764.47	1185.74	0.81	1813.10	1754.04	0.47
Relationship status (reference: single)									
Non-married	-3481.23	1664.79	0.09	-3425.00	2357.81	0.29	-3505.44	2406.73	0.41
Married	-2562.95	1158.46	0.09	-2889.54	1611.74	0.29	-2332.38	1704.56	0.41
Divorced	-3530.16	1573.89	0.09	-3659.17	2079.39	0.29	-3544.38	2447.05	0.41
Annual income (reference: < \$100K)									
\$100–\$200K	1998.26	986.88	0.04	1802.06	1433.11	0.31	2143.10	1399.66	0.13
> \$200K	705.29	958.33	0.04	825.85	1359.85	0.31	382.27	1435.07	0.13
Spousal income > \$100K	983.89	704.25	0.16	2409.70	961.70	0.01	-334.72	1046.94	0.75
Number of children (reference: none)									
1–2	618.93	763.81	0.72	182.20	1072.76	0.81	1007.16	1117.73	0.56
3+	535.90	823.10	0.72	579.62	1102.14	0.81	108.12	1337.25	0.56
Main caregiver (reference: self)									
Spouse	-470.58	1048.48	0.57	-701.52	1423.45	0.39	-1707.61	2242.67	0.89
Equal spouse/dentist	-611.05	958.58	0.57	-1139.08	1433.98	0.39	-332.89	1372.69	0.89
Other	-1383.89	1045.07	0.57	-2052.49	1451.96	0.39	-723.21	1751.95	0.89
Household chores (reference: self)									
Spouse	-661.69	783.12	0.63	-1018.88	1134.96	0.68	-1567.92	1662.83	0.71
Equal spouse/dentist	-131.40	699.20	0.63	-771.41	1114.21	0.68	172.40	1011.11	0.71
Paid	-1099.57	1028.20	0.63	-1826.92	1559.35	0.68	-771.47	1450.60	0.71
Percent pediatric patients (continuous)	-5.38	14.71	0.71	-25.64	20.95	0.22	9.77	21.85	0.66
Planned retirement age (continuous)	2.50	48.82	0.96	-59.57	65.62	0.37	72.13	81.20	0.38
Stress in work-life balance (continuous)	209.53	223.99	0.35	216.62	282.78	0.44	238.03	376.02	0.53
Ethnic origin (reference: Canadian)									
Chinese	979.63	939.81	0.01	1293.41	1254.73	0.19	927.22	1420.91	0.01
European	2234.89	791.58	0.01	223.33	1051.53	0.19	4117.38	1207.37	0.01
South Asian	2565.79	994.88	0.01	1756.95	1325.79	0.19	3461.78	1504.40	0.01
Other	1279.12	919.34	0.01	2422.06	1144.88	0.19	96.30	1481.76	0.01

SE = standard error



**Table 7:** Multivariable analysis of factors associated with the amount of pro bono care (\$/month) provided by Ontario dentists.

Variable	All respondents (n = 864)			Male dentists (n = 463)			Female dentists (n = 401)		
	$\beta$	SE	p	$\beta$	SE	p	$\beta$	SE	p
Age				482.56	167.15	<0.01			
Internationally trained (reference: domestically trained)	2641.43	793.84	0.001				4209.78	1207.90	<0.01
Graduation year (continuous)				470.62	159.33	<0.01			
Hours worked/week (continuous)	46.04	32.27	0.15	58.58	44.20	0.19			
Relationship status (reference: single)									
Non-married	-4430.60	1810.58	0.02						
Married	-2800.40	1230.66	0.02						
Divorced	-4008.94	1658.67	0.02						
Annual income (reference: < \$100K)									
\$100–\$200K	2214.08	1034.28	0.03				2772.64	1351.94	0.04
> \$200K	1011.01	1038.82	0.33				1053.81	1406.26	0.45
Spousal income > \$100K				1267.13	995.44	0.20			
Ethnic origin (reference: Canadian)									
Chinese	793.75	995.2	0.43				941.24	1458.44	0.52
European	2209.43	898.51	0.01				2938.80	1414.12	0.04
South Asian	1356.04	1067.09	0.2				1975.23	1561.21	0.21
Other	712.59	1006.39	0.48				-1367.07	1534.10	0.37
<i>SE = standard error</i>									

those in a non-married relationship, married and divorced reported providing about \$4431, \$2800 and \$4009 less monthly pro bono care, respectively. Dentists with an annual income of \$100–200 thousand reported providing \$2214 more monthly pro bono care than dentists earning < \$100 thousand/year.

With each year increase in age, male dentists only reported providing \$483 more monthly pro bono care. Male dentists who graduated more recently reported providing \$471 more monthly pro bono care. For female dentists only, those who were internationally trained reported providing \$4210 more monthly pro bono care than their domestically trained counterparts. Female dentists with an annual income of \$100–200 thousand reported providing \$2773 more monthly pro bono care than female dentists earning less than \$100 thousand/year. Female dentists of European ethnicity reported providing \$2939 more monthly pro bono care than those of Canadian ethnicity.

## Discussion

This study was an exercise in hypothesis generation to determine what factors are associated with the provision of government-funded

and pro bono dental care and whether gender differences are associated with such work. Some of our findings were consistent with what would be expected given the nature of government-funded dental programs. For example, government-funded programs are generally focused on the pediatric population; thus, it is unsurprising that practices with a large proportion of pediatric patients also had more government-funded patients. Similarly, practice ownership can be challenging from both a financial and time perspective. Thus, given long-standing provider concerns around government-funded programs (i.e., low fees, burdensome administration), it is unsurprising that practice owners reported fewer government-funded patients. On the other hand, associates reported more government-funded patients, who they may be willing to treat because of their relative position in a practice. For instance, they may be more willing to accept a reduced fee over an empty appointment, or they do not have to make the “ownership” trade-off of treating government-funded patients given the financial pressures of running a business.

Other study findings are more difficult to interpret. For example, a dentist’s life stage appears to play a complex role in our outcomes. Dentists in non-married relationships had more government-funded patients than single dentists. We expected the reverse, given the

assumption that single dentists would arguably be recent graduates and, thus, associates. However, it could be that more recent graduates are burdened with higher debt loads compared with those in later life stages and may consider treating fewer government-funded patients to meet financial and/or lifestyle commitments.

Similarly, with higher debt and possibly lower income, the single dentist may also be reluctant to provide pro bono care compared with other relationship statuses; yet, the reverse was observed. One could reason that married or divorced dentists may represent someone in the middle or later stages of their career, which could indicate higher expenses resulting from dependents or other financial responsibilities. Therefore, dentists in these stages of life may be reluctant to provide pro bono care when compared with single dentists.

Of interest, annual income was a predictor of the amount of monthly pro bono care provided, but only for the \$100–200 thousand category. We hypothesize that dentists who reported making < \$100 thousand/year have greater financial constraints and, therefore, provide less pro bono care. Those who reported earning > \$200 thousand/year might represent dentists with the highest practice and personal expenses. Those in the highest income bracket may also be more business or financially focused and may elect to not provide as much pro bono in favour of higher remuneration.

Dentists who identified themselves as being of European ethnicity reported providing more monthly pro bono care than those identifying themselves as Canadian. Many European countries are more focused on social solidarity and promoting the public good compared with British North American or even East Asian countries.<sup>9</sup> Dentists raised with this philosophy might, thus, be more willing to give back to the community. In addition, internationally trained dentists, particularly female dentists, provided greater levels of pro bono care. This could be related to the same issue of ethnicity, or it could be related to a differential focus in international vs. Canadian dental curricula (e.g., outreach, social responsibility, more contact with socially and economically marginalized groups), although this is speculation.

Finally, as in previous studies using the same data,<sup>7,8</sup> a gendered dynamic does exist in predicting 1 outcome of this study, but to a much lesser degree compared with how it influences hours worked and practice ownership. In this case, female dentists who reported paying someone to complete household chores treated fewer government-funded patients. This could indicate that an individual with higher personal expenses would be more reluctant to treat government-funded patients, yet this logic did not extend to provision of pro bono care. Again, this is speculation and highlights the difficulty of interpreting our findings.

Nevertheless, it is noteworthy that in a descriptive and absolute sense, male and female dentists are not that different in terms of levels of government-funded and pro bono dental care (Tables 2 and 5). In one sense, this speaks to a certain level of homogeneity in the dental community in relation to these outcomes, a level of homogeneity that is arguably not present in the variables studied thus far in the continuing gender shift at play in the Canadian dental profession and elsewhere (e.g., hours worked, practice ownership, referrals, choice of practice models, involvement in academia and leadership).<sup>6-8</sup>

As in any study, ours should be considered within its limitations and strengths. This study is based on a survey taken in 2012 and, given its cross-sectional nature, can only be hypothesis-generating. It is also subject to recall error, response bias and social desirability bias. For example, does a dentist accurately report the percentage of their patients covered by government-funded dental programs and/or the amount of pro bono care they provide? Did respondents understand what was meant by pro bono care? This term suffers from a lack of specificity; do dentists view government-funded programs and performing procedures at a reduced cost as being pro bono care, like performing services at no cost? Other studies have demonstrated that physicians list unpaid teaching, short-term mission work and screenings at schools and other organizations as a form of pro bono activity.<sup>10,11</sup> Similarly, this study could not assess whether dentists accurately evaluated the proportion of government-funded and amount of pro bono work they do. Nevertheless, the point was not to determine the value of these services, but rather relative amounts (i.e., what factors predicted lesser or greater amounts of each). Research is needed to assess the validity of such questions for use in future surveys, such as providing a working definition of what pro bono care entails to minimize potential ambiguity.

Another limitation of this study is response bias, as the response rate was only 29% and may not accurately represent the entire Ontario dentist population. Dentists who participate in government-funded programs and pro bono care may have been more likely to respond to this survey than those who do not. This could skew the percentages. However, for a single mailing, the response rate was excellent and, more important, the descriptive statistics appear to be comparable to Ontario Dental Association published statistics, which cover approximately 95% of all Ontario dentists.<sup>12</sup>

This study may be of interest to governments, regulators, educators and associations in enabling a better understanding of how Ontario dentists practise and what factors affect their decisions to treat government-funded patients and provide pro bono care. Yet, considering that the correlates identified in this study are not amenable to policy action (income, ethnicity, relationship status), interested parties should ultimately focus on improvements to current

government-funded dental programs and, more important, structural interventions to improve access to dental care. The former could incentivize greater professional uptake of these programs, and the latter would more effectively address current challenges, especially as charity, in the form of pro bono care, although an intrinsic professional ideal, is insufficient to address existing challenges.

## Conclusions

Professional and personal factors appear to be associated with Ontario dentists' motivations and decisions to treat government-funded patients and provide pro bono care. Although the responses of female and male dentists were almost identical with regard to these outcomes, a limited number of factors influence differences between these groups.

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## **Appendix 1. Relevant questions selected from the original 2012 survey.**

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1. Where did you receive your initial dental training?
2. Please indicate the graduation year of your initial dental degree (DDS/DMD/BDS) in the space provided below.
3. Please indicate your degree(s).
4. Please indicate type of practitioner.
5. IF YOU ARE A SPECIALIST, please indicate the year of graduation from this degree in the space below.
6. What best describes your style of practice (check all that apply)?
7. If you DO NOT own a practice, is this a goal for the future?
8. If you DO NOT own a practice, please indicate the reason(s) (check all that apply).
9. IF YOU OWN a practice, is your life partner/spouse employed at the business?
10. Where is your primary practice located?
11. IF YOU OWN a practice, indicate the number of staff you employ.
12. How many hours do you work a week (including clinical and administrative roles)?
13. IF YOU WORK PART-TIME OR  $\leq 20$  H/WEEK, please indicate the reasons (check all that apply).
14. In terms of a dollar amount (\$), approximately how much pro bono work do you provide each month?
15. What percentage of your patients are covered by government dental programs?
16. What percentage of your patients are pediatric patients?
17. IF YOU ARE A GENERAL PRACTITIONER, please identify the types and proportions of services you typically refer to specialists.
18. For what percentage of patients do you give individualized preventive treatment specifically for their needs?
19. At what age did you, or do you, plan to retire?
20. Do you plan on pursuing locum placements upon retirement?
21. How confident are you about your business knowledge and skills?
22. Do you participate in any leadership roles related to dentistry (check all that apply)?
23. Indicate your satisfaction with your career according to the statements below.
24. Please indicate your relationship status.

25. At present, who is the primary caregiver of your children?
26. In your household, who does the majority of routine household chores (cleaning, laundry, yard work, cooking, grocery shopping, banking)?
27. Have you made significant concessions to your career to pursue a family (e.g., relocated, reduced/alterd work hours, missed opportunities, failing to reach full potential, etc.)?
28. Did you encounter difficulty upon returning to work?
29. Do you plan to, or did you, return to work full-time work after the break?
30. Would you be interested in formal financial incentives for practice relocation to rural communities?
31. In the UK, it has been recommended that authorities initiate registers of dentists who would be available at short notice to provide coverage for absence related to childcare, sickness, parental leave, etc. Would you be interested in the development of such registers in your jurisdiction?
32. If you are a private practice owner, would you have reservations about hiring a dentist who has taken a career break?
33. Which qualities would be, or were, important for you in selecting a specialty (check all that apply)?
34. What types of measures do you think are needed to encourage more practitioners to pursue specialty training (check all that apply)?
35. Sex
36. Age
37. Ethnic origin
38. What is your gross annual income?
39. What is your spouse's gross annual income?