Supplementary Material

General practice registrars' practice in outer metropolitan Australia: a cross-sectional comparison with rural and inner metropolitan areas

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Supplementary Table S1: Characteristics associated with Outer Metropolitan, Inner Metropolitan, and Regional/Remote practice location

Variable	Class	Main Analysis				Sensitivity Analysis			
		Outer metropolitan	Inner metropolitan	Regional and remote	p	Outer metropolitan	Inner metropolitan	Regional and remote	p
Registrar variables									
Registrar gender	Male	15150 (41%)	24853 (41%)	32041 (41%)	0.99	28320 (39%)	24853 (41%)	32041 (41%)	0.87
	Female	22067 (59%)	36455 (59%)	46341 (59%)		43647 (61%)	36455 (59%)	46341 (59%)	
Registrar FT or PT	Part-time	8212 (24%)	12754 (23%)	15302 (21%)	0.57	15931 (24%)	12754 (23%)	15302 (21%)	0.48
	Full-time	25711 (76%)	43480 (77%)	55941 (79%)		49141 (76%)	43480 (77%)	55941 (79%)	
Term	Term 1	14511 (39%)	23665 (39%)	32958 (42%)	0.002	26995 (38%)	23665 (39%)	32958 (42%)	0.001
	Term 2	13146 (35%)	21743 (35%)	28124 (36%)		25241 (35%)	21743 (35%)	28124 (36%)	
	Term 3	9560 (26%)	15959 (26%)	17360 (22%)		19731 (27%)	15959 (26%)	17360 (22%)	
Worked at practice previously	No	27903 (82%)	49271 (88%)	46946 (65%)	<0.001	48308 (74%)	49271 (88%)	46946 (65%)	<0.001
	Yes	5960 (18%)	6966 (12%)	25341 (35%)		17063 (26%)	6966 (12%)	25341 (35%)	
Qualified as doctor in Australia	No	3333 (9%)	3872 (6%)	33248 (43%)	<0.001	6256 (9%)	3872 (6%)	33248 (43%)	<0.001
	Yes	32864 (91%)	56665 (94%)	43529 (57%)		64340 (91%)	56665 (94%)	43529 (57%)	
Pathway	General	36018 (99.5%)	60178 (99.4%)	11603 (15%)	<0.001	69465 (98%)	60178 (99.4%)	11603 (15%)	<0.001
	Rural	179 (0.5%)	359 (0.6%)	64994 (85%)		1071 (2%)	359 (0.6%)	64994 (85%)	
Has previous health qualification	No	31451 (87%)	52242 (86%)	65484 (85%)	0.75	60935 (87%)	52242 (86%)	65484 (85%)	0.69
	Yes	4566 (13%)	8295 (14%)	11115 (15%)		9481 (13%)	8295 (14%)	11115 (15%)	

		Main Analysis				**Sensitivity Analysis**			
Variable	**Class**	**Outer metropolitan**	**Inner metropolitan**	**Regional and remote**	**p**	**Outer metropolitan**	**Inner metropolitan**	**Regional and remote**	**p**
Has post-graduate training	No	24353 (67%)	39055 (65%)	46747 (61%)	0.15	47438 (67%)	39055 (65%)	46747 (61%)	0.14
	Yes	11784 (33%)	21062 (35%)	29970 (39%)		23038 (33%)	21062 (35%)	29970 (39%)	
Has other regular medical work	No	29454 (87%)	49708 (88%)	52713 (72%)	<0.001	55828 (85%)	49708 (88%)	52713 (72%)	<0.001
	Yes	4589 (13%)	6943 (12%)	20319 (28%)		9662 (15%)	6943 (12%)	20319 (28%)	
Registrar age	mean (SD)	31.5 (5.6)	31.4 (5.3)	35.4 (7.1)	<0.001	32 (6)	31 (5)	35 (7)	<0.001
Years worked at hospital	mean (SD)	2.8(2.8)	2.9 (2.7)	4.5 (3.9)	<0.001	3 (3)	3 (3)	4 (4)	<0.001
Practice variables									
Practice size	Small	16716 (49%)	32610 (58%)	28810 (40%)	<0.001	29063 (45%)	32610 (58%)	28810 (40%)	<0.001
	Large	17267 (51%)	23445 (42%)	43265 (60%)		35857 (55%)	23445 (42%)	43265 (60%)	
Practice routinely bulk bills	No	11811 (35%)	15798 (28%)	57649 (79%)	<0.001	36801 (56%)	15798 (28%)	57649 (79%)	<0.001
	Yes	22172 (65%)	40734 (72%)	15389 (21%)		28510 (44%)	40734 (72%)	15389 (21%)	
Socioeconomic Index for Areas (decile)	mean (SD)	5.9 (2.8)	6.0 (3.2)	3.8 (1.8)	<0.001	6 (3)	6 (3)	4 (2)	<0.001
Patient variables									
Patient age group	0-14 years	7404 (20%)	10377 (17%)	10497 (14%)	<0.001	13111 (18%)	10377 (17%)	10497 (14%)	<0.001
	15-34 years	11028 (30%)	21006 (35%)	17957 (23%)		20452 (29%)	21006 (35%)	17957 (23%)	
	35-64 years	13738 (37%)	21503 (35%)	28811 (37%)		26203 (37%)	21503 (35%)	28811 (37%)	
	65+ years	4651 (13%)	7690 (13%)	20028 (26%)		11343 (16%)	7690 (13%)	20028 (26%)	
Aboriginal and/or	No	32776 (98%)	55459 (99.1%)	66074 (96%)	<0.001	62945 (98%)	55459 (99.1%)	66074 (96%)	<0.001

Variable	Class	Main Analysis				Sensitivity Analysis			
		Outer metropolitan	Inner metropolitan	Regional and remote	p	Outer metropolitan	Inner metropolitan	Regional and remote	p
Torres Strait Islander status	Yes	747 (2%)	501 (0.9%)	2687 (4%)		1574 (2%)	501 (0.9%)	2687 (4%)	
Non-English-speaking background	No	28569 (88%)	42192 (75%)	65784 (98%)	<0.001	57956 (92%)	42192 (75%)	65784 (98%)	<0.001
	Yes	4076 (12%)	13775 (25%)	1605 (2%)		5008 (8%)	13775 (25%)	1605 (2%)	
Patient/practice status	Existing patient	14061 (38%)	22310 (37%)	34650 (45%)	<0.001	29488 (42%)	22310 (37%)	34650 (45%)	<0.001
	New to registrar	19976 (55%)	31136 (52%)	36125 (47%)		36115 (51%)	31136 (52%)	36125 (47%)	
	New to practice	2605 (7%)	6926 (11%)	5615 (7%)		5190 (7%)	6926 (11%)	5615 (7%)	
Patient gender	Male	15264 (42%)	25224 (42%)	31258 (41%)	0.13	28356 (40%)	25224 (42%)	31258 (41%)	0.042
	Female	21351 (58%)	34914 (58%)	45624 (59%)		42275 (60%)	34914 (58%)	45624 (59%)	
	Non-binary	6 (0.0%)	7 (0.0%)	19 (0.0%)		9 (0.0%)	7 (0.0%)	19 (0.0%)	
Consultation variables									
Sought help any source	None	28183 (76%)	46163 (75%)	55398 (71%)	<0.001	53342 (74%)	46163 (75%)	55398 (71%)	<0.001
	Supervisor	3454 (9%)	6306 (10%)	8017 (10%)		7187 (10%)	6306 (10%)	8017 (10%)	
	Other sources	5580 (15%)	8898 (14%)	15027 (19%)		11438 (16%)	8898 (14%)	15027 (19%)	
Chronic problem	No	29085 (78%)	48278 (79%)	55594 (71%)	<0.001	53859 (75%)	48278 (79%)	55594 (71%)	<0.001
	Yes	8132 (22%)	13089 (21%)	22848 (29%)		18108 (25%)	13089 (21%)	22848 (29%)	
Consultation duration	mean (SD)	17.7 (10.1)	17.9 (10)	18.6(10.0)	<0.001	18 (10)	18 (10)	19 (10)	<0.001
Number of problems	mean (SD)	1.5 (0.8)	1.5 (0.8)	1.6 (0.8)	<0.001	2 (1)	1 (1)	2 (1)	0.001
Procedure	No	34128 (92%)	55785 (91%)	72679 (93%)	<0.001	66068 (92%)	55785 (91%)	72679 (93%)	<0.001

		Main Analysis				Sensitivity Analysis			
Variable	**Class**	**Outer metropolitan**	**Inner metropolitan**	**Regional and remote**	**p**	**Outer metropolitan**	**Inner metropolitan**	**Regional and remote**	**p**
performed	Yes	3089 (8%)	5582 (9%)	5763 (7%)		5899 (8%)	5582 (9%)	5763 (7%)	
Consultation outcome factors									
Imaging ordered	No	33274 (89%)	54629 (89%)	68448 (87%)	<0.001	63771 (89%)	54629 (89%)	68448 (87%)	<0.001
	Yes	3943 (11%)	6738 (11%)	9994 (13%)		8196 (11%)	6738 (11%)	9994 (13%)	
Follow-up ordered	None	17862 (48%)	28138 (46%)	34586 (44%)	<0.001	34193 (48%)	28138 (46%)	34586 (44%)	0.001
	GP appt or phone	17257 (46%)	29891 (49%)	38551 (49%)		33258 (46%)	29891 (49%)	38551 (49%)	
	With someone else	2097 (6%)	3338 (5%)	5305 (7%)		4515 (6%)	3338 (5%)	5305 (7%)	
Learning goals generated	No	20048 (72%)	35886 (72%)	35969 (64%)	<0.001	53064 (78%)	35886 (72%)	35969 (64%)	0.001
	Yes	7978 (28%)	13859 (28%)	19957 (36%)		15192 (22%)	13859 (28%)	19957 (36%)	
Referral ordered	No	31515 (85%)	50922 (83%)	63545 (81%)	<0.001	59622 (83%)	50922 (83%)	63545 (81%)	<0.001
	Yes	5702 (15%)	10445 (17%)	14897 (19%)		12345 (17%)	10445 (17%)	14897 (19%)	
Pathology ordered	No	29859 (80%)	47758 (78%)	59942 (76%)	<0.001	56632 (79%)	47758 (78%)	59942 (76%)	0.001
	Yes	7358 (20%)	13609 (22%)	18500 (24%)		15335 (21%)	13609 (22%)	18500 (24%)	
Medication prescribed	No	17818 (48%)	29423 (48%)	35600 (45%)	<0.001	33610 (47%)	29423 (48%)	35600 (45%)	<0.001
	Yes	19399 (52%)	31944 (52%)	42842 (55%)		38357 (53%)	31944 (52%)	42842 (55%)	

Supplementary Table S2: Comparison of (univariable and multinomial) logistic regression models for Outer Metropolitan, Inner Metropolitan, and Regional/Remote practice location between main and sensitivity analysis

| | | | Main analysis | | | | Sensitivity analysis | | | |
| | | | Univariable | | Adjusted | | Univariable | | Adjusted | |
Variable	Class	Referent	OR [95% CI]	p	*OR [95% CI]*	p	OR [95% CI]	p	OR [95% CI]	p
Model 1 - registrar and practice level variables (registrar-term level)										
Registrar variables										
Term Referent: Term 1	Term 2	Inner metropolitan	0.99 (0.81, 1.19)	0.89	*0.88 (0.70, 1.12)*	0.30	1.02 (0.88, 1.17)	0.81	0.75 (0.61, 0.92)	0.006
		Regional and remote	1.06 (0.93, 1.22)	0.399	*2.00 (1.53, 2.61)*	<.001	1.10 (1.00, 1.21)	0.061	1.65 (1.34, 2.04)	<.001
	Term 3	Inner metropolitan	0.98 (0.77, 1.24)	0.85	0.90 (0.68, 1.19)	0.45	1.08 (0.90, 1.30)	0.38	0.88 (0.70, 1.11)	0.29
		Regional and remote	1.25 (1.03, 1.51)	0.022	1.52 (1.10, 2.11)	0.011	1.39 (1.20, 1.61)	<.001	1.53 (1.21, 1.94)	<0.001
Worked at practice previously	Yes	Inner metropolitan	1.51 (1.16, 1.96)	0.002	1.62 (1.19, 2.21)	0.002	2.50 (2.03, 3.07)	<.001	2.70 (2.08, 3.50)	<.001
		Regional and remote	0.40 (0.32, 0.49)	<.001	0.32 (0.23, 0.44)	<.001	0.65 (0.57, 0.75)	<.001	0.56 (0.44, 0.71)	<.001
Qualified as doctor in Australia	Yes	Inner metropolitan	0.67 (0.42, 1.09)	0.11	0.56 (0.32, 0.98)	0.040	0.70 (0.46, 1.08)	0.11	0.54 (0.33, 0.88)	0.014
		Regional and remote	7.53 (4.93, 11.51)	<.001	9.19 (4.90, 17.26)	<.001	7.86 (5.60, 11.02)	<.001	8.71 (5.74, 13.21)	<.001
Has post-grad qualification	Yes	Inner metropolitan					0.90 (0.71, 1.14)	0.38	0.88 (0.69, 1.13)	0.32
		Regional and remote					0.76 (0.59, 0.97)	0.026	0.83 (0.62, 1.12)	0.22
Registrar age		Inner metropolitan	1.01 (0.98, 1.03)	0.72	1.00 (0.97, 1.03)	0.98	1.03 (1.00, 1.05)	0.030	1.01 (0.99, 1.03)	0.38

			Main analysis				Sensitivity analysis			
			Univariable		Adjusted		Univariable		Adjusted	
Variable	Class	Referent	OR [95% CI]	p	*OR [95% CI]*	p	OR [95% CI]	p	OR [95% CI]	p
		Regional and remote	0.91 (0.88, 0.93)	<.001	0.96 (0.93, 0.99)	0.015	0.93 (0.91, 0.95)	<.001	0.98 (0.95, 1.00)	0.083
Years worked at hospital		Inner metropolitan	0.99 (0.92, 1.06)	0.76	0.98 (0.91, 1.05)	0.55				
		Regional and remote	0.85 (0.79, 0.91)	<.001	0.99 (0.91, 1.08)	0.85				
Practice variables										
Practice size	Small	Inner metropolitan	0.70 (0.55, 0.88)	0.002	0.74 (0.58, 0.93)	0.011	0.58 (0.48, 0.71)	<.001	0.74 (0.60, 0.92)	0.005
		Regional and remote	1.45 (1.15, 1.84)	0.002	1.16 (0.87, 1.55)	0.32	1.22 (1.00, 1.48)	0.051	1.09 (0.85, 1.38)	0.50
Practice routinely bulk bills	Yes	Inner metropolitan	0.73 (0.57, 0.93)	0.011	0.71 (0.55, 0.91)	0.008	0.30 (0.24, 0.37)	<.001	0.29 (0.24, 0.36)	<.001
		Regional and remote	7.03 (5.39, 9.17)	<.001	14.95 (10.26, 21.77)	<.001	2.90 (2.30, 3.65)	<.001	5.26 (3.88, 7.13)	<.001
Socioeconomic Index for Areas Index of Relative social Disadvantage (decile)		Inner metropolitan	0.98 (0.94, 1.03)	0.40	0.98 (0.94, 1.02)	0.37	0.93 (0.90, 0.97)	0.001	0.92 (0.88, 0.96)	<0.001
		Regional and remote	1.35 (1.29, 1.41)	<.001	1.50 (1.41, 1.60)	<.001	1.31 (1.27, 1.36)	<.001	1.40 (1.33, 1.48)	<.001
Model 2 – all above + patient factors (consultation level)										
Patient Variables										
Patient age group	0-14 years	Inner metropolitan	1.36 (1.26, 1.46)	<.001	1.39 (1.28, 1.50)	<.001	1.30 (1.21, 1.39)	<.001	1.29 (1.20, 1.39)	<.001
Referent: 15-34 years		Regional and remote	1.15 (1.08, 1.22)	<.001	1.32 (1.20, 1.45)	<.001	1.10 (1.04, 1.16)	0.001	1.16 (1.07, 1.25)	<0.001
	35-64 years	Inner metropolitan	1.22 (1.15, 1.28)	<.001	1.23 (1.16, 1.30)	<.001	1.25 (1.19, 1.31)	<.001	1.23 (1.17, 1.30)	<.001

Variable	Class	Referent	Main analysis				Sensitivity analysis			
			Univariable		Adjusted		Univariable		Adjusted	
			OR [95% CI]	p	*OR [95% CI]*	p	OR [95% CI]	p	OR [95% CI]	p
		Regional and remote	0.78 (0.74, 0.82)	<.001	0.84 (0.79, 0.90)	<.001	0.80 (0.76, 0.83)	<.001	0.85 (0.81, 0.90)	<.001
	65+ years	Inner metropolitan	1.15 (1.03, 1.28)	0.011	1.18 (1.05, 1.31)	0.004	1.51 (1.37, 1.67)	<.001	1.41 (1.26, 1.56)	<.001
		Regional and remote	0.38 (0.34, 0.42)	<.001	0.47 (0.41, 0.53)	<.001	0.50 (0.46, 0.54)	<.001	0.59 (0.54, 0.65)	<.001
Patient gender Referent: Male	Female	Inner metropolitan	1.01 (0.96, 1.06)	0.67	1.06 (1.00, 1.12)	0.038	1.08 (1.03, 1.13)	0.001	1.11 (1.06, 1.17)	<.001
		Regional and remote	0.96 (0.91, 1.01)	0.12	0.96 (0.89, 1.03)	0.22	1.02 (0.97, 1.07)	0.39	1.03 (0.97, 1.10)	0.33
	Non-binary	Inner metropolitan	1.42 (0.41, 4.94)	0.59	2.09 (0.38, 11.66)	0.40	1.14 (0.38, 3.46)	0.81	1.25 (0.27, 5.86)	0.78
		Regional and remote	0.65 (0.22, 1.88)	0.42	1.21 (0.29, 4.98)	0.79	0.52 (0.21, 1.28)	0.16	0.53 (0.18, 1.56)	0.25
Aboriginal or Torres Strait Islander	Yes	Inner metropolitan	2.52 (1.96, 3.25)	<.001	1.93 (1.47, 2.54)	<.001	2.77 (2.21, 3.46)	<.001	1.99 (1.53, 2.58)	<.001
		Regional and remote	0.56 (0.46, 0.68)	<.001	0.71 (0.57, 0.88)	0.002	0.61 (0.53, 0.71)	<.001	0.76 (0.64, 0.89)	0.001
Non-English Speaking Background	Yes	Inner metropolitan	0.44 (0.36, 0.53)	<.001	0.43 (0.36, 0.52)	<.001	0.26 (0.22, 0.31)	<.001	0.30 (0.25, 0.37)	<.001
		Regional and remote	5.85 (4.72, 7.25)	<.001	7.60 (5.85, 9.88)	<.001	3.54 (2.89, 4.34)	<.001	4.25 (3.38, 5.36)	<.001
Patient/practice status Referent: existing patient	New to registrar	Inner metropolitan	1.02 (0.94, 1.11)	0.68	1.06 (0.97, 1.15)	0.18	0.88 (0.82, 0.94)	<0.001	0.99 (0.92, 1.07)	0.81
		Regional and remote	1.36 (1.25, 1.48)	<.001	1.16 (1.05, 1.27)	0.003	1.17 (1.10, 1.26)	<.001	1.07 (0.99, 1.16)	0.068
	New to practice	Inner metropolitan	0.60 (0.54, 0.67)	<.001	0.68 (0.61, 0.76)	<.001	0.57 (0.52, 0.62)	<.001	0.73 (0.66, 0.81)	<.001
		Regional and remote	1.14 (1.03, 1.27)	0.015	0.76 (0.66, 0.87)	<.001	1.09 (0.99, 1.19)	0.070	0.83 (0.75, 0.93)	0.001

			Main analysis				Sensitivity analysis			
			Univariable		Adjusted		Univariable		Adjusted	
Variable	Class	Referent	OR [95% CI]	p	*OR [95% CI]*	p	OR [95% CI]	p	OR [95% CI]	p
Model 3 – all above + consultation factors (consultation level)										
Consultation variables										
Chronic problem	Yes	Inner metropolitan	1.03 (0.96, 1.10)	0.38	0.98 (0.91, 1.06)	0.61	1.24 (1.17, 1.32)	<.001	1.10 (1.03, 1.18)	0.006
		Regional and remote	0.68 (0.63, 0.73)	<.001	0.84 (0.77, 0.92)	0.001	0.82 (0.77, 0.87)	<.001	0.98 (0.91, 1.06)	0.63
Procedure performed	Yes	Inner metropolitan	0.90 (0.81, 1.01)	0.064	0.91 (0.81, 1.03)	0.15	0.89 (0.82, 0.97)	0.008	0.91 (0.82, 1.01)	0.087
		Regional and remote	1.14 (1.02, 1.27)	0.019	1.14 (0.99, 1.32)	0.078	1.13 (1.03, 1.23)	0.007	1.13 (1.01, 1.26)	0.027
Consultation duration		Inner metropolitan	1.00 (0.99, 1.00)	0.50	1.00 (1.00, 1.01)	0.33	1.00 (1.00, 1.01)	0.65	1.00 (1.00, 1.01)	0.72
		Regional and remote	0.99 (0.99, 1.00)	0.001	1.00 (0.99, 1.01)	0.89	0.99 (0.99, 1.00)	0.001	1.00 (0.99, 1.00)	0.41
Model 4 – all above variables + consultation outcome factors (consultation level)										
Consultation outcome variables										
Imaging ordered	Yes	Inner metropolitan	0.96 (0.90, 1.02)	0.21	0.95 (0.89, 1.03)	0.20	1.04 (0.99, 1.10)	0.13	1.03 (0.96, 1.10)	0.42
		Regional and remote	0.81 (0.76, 0.86)	<.001	0.82 (0.75, 0.89)	<.001	0.88 (0.84, 0.93)	<.001	0.92 (0.86, 0.98)	0.008
Follow-up ordered	Other GP in the practice	Inner metropolitan	0.99 (0.85, 1.15)	0.89	0.91 (0.78, 1.06)	0.23	1.11 (0.98, 1.27)	0.10	0.96 (0.84, 1.11)	0.61
Referent: None		Regional and remote	0.77 (0.66, 0.89)	0.001	1.01 (0.84, 1.22)	0.92	0.86 (0.76, 0.97)	0.017	1.12 (0.96, 1.30)	0.16
	With themselves	Inner metropolitan	0.91 (0.81, 1.02)	0.10	0.92 (0.80, 1.06)	0.23	0.92 (0.83, 1.01)	0.073	0.94 (0.82, 1.06)	0.31
		Regional and remote	0.87 (0.77, 0.98)	0.021	1.07 (0.91, 1.25)	0.42	0.87 (0.79, 0.96)	0.007	1.06 (0.93, 1.21)	0.36
Learning goals generated	Yes	Inner metropolitan	0.92 (0.80, 1.05)	0.20	0.93 (0.80, 1.09)	0.37	0.92 (0.82, 1.04)	0.17	0.91 (0.79, 1.05)	0.18

Variable	Class	Referent	Main analysis				Sensitivity analysis			
			Univariable		Adjusted		Univariable		Adjusted	
			OR [95% CI]	p	*OR [95% CI]*	p	OR [95% CI]	p	OR [95% CI]	p
		Regional and remote	0.74 (0.64, 0.86)	<.001	1.04 (0.87, 1.24)	0.70	0.75 (0.66, 0.85)	<.001	0.97 (0.83, 1.13)	0.66
Referral ordered	Yes	Inner metropolitan	0.88 (0.83, 0.94)	<.001	0.80 (0.74, 0.86)	<.001	1.01 (0.96, 1.07)	0.73	0.86 (0.81, 0.93)	<.001
		Regional and remote	0.77 (0.73, 0.82)	<.001	0.84 (0.77, 0.91)	<.001	0.88 (0.84, 0.93)	<.001	0.95 (0.88, 1.02)	0.14
Pathology ordered	Yes	Inner metropolitan	0.86 (0.82, 0.92)	<.001	0.89 (0.83, 0.95)	0.001	0.95 (0.90, 1.00)	0.048	0.97 (0.91, 1.03)	0.32
		Regional and remote	0.80 (0.75, 0.85)	<.001	0.75 (0.69, 0.82)	<.001	0.88 (0.83, 0.92)	<.001	0.87 (0.82, 0.93)	<.001