



## **Appendix**

**This appendix was part of the submitted manuscript and has been peer reviewed.  
It is posted as supplied by the authors.**

Appendix to: Magin PJ, Tapley A, Morgan S, et al. Changes in pathology test ordering by early career general practitioners: a longitudinal study. *Med J Aust* 2017; 207: 70-74. doi: 10.5694/mja16.01421.

**Table 1: Characteristics associated with number of pathology tests ordered (with individual covariates, adjusted for time). The number of pathology tests have been grouped for simplicity of presentation**

Variable	Class	0 tests	1 test	2–3 tests	4–5 tests	6–12 tests	Total	Univariate <i>P</i> *
Time	Mean (SD)	0.93 (0.89)	0.91 (0.89)	0.87 (0.89)	0.90 (0.91)	0.92 (0.90)		0.005
Patient age group	0-14	17958 (20.7%)	1286 (11.2%)	277 (6.0%)	118 (2.9%)	170 (2.8%)	19809 (17.5%)	< 0.001
	15-34	21847 (25.2%)	3245 (28.3%)	1623 (35.4%)	1193 (29.2%)	1996 (32.9%)	29904 (26.5%)	
	35-64	31648 (36.5%)	4762 (41.6%)	1897 (41.4%)	1994 (48.7%)	2938 (48.4%)	43239 (38.3%)	
	65+	15240 (17.6%)	2160 (18.9%)	790 (17.2%)	787 (19.2%)	964 (15.9%)	19941 (17.7%)	
Patient sex	Male	35502 (41.4%)	3026 (26.7%)	1413 (31.2%)	1536 (37.9%)	1910 (31.8%)	43387 (38.9%)	< 0.001
	Female	50186 (58.6%)	8309 (73.3%)	3120 (68.8%)	2519 (62.1%)	4101 (68.2%)	68235 (61.1%)	
Aboriginal or Torres Strait Islander	No	82458 (98.9%)	10930 (99.0%)	4357 (98.6%)	3900 (98.7%)	5792 (98.6%)	107437 (98.8%)	0.21
	Yes	953 (1.1%)	115 (1.0%)	62 (1.4%)	53 (1.3%)	81 (1.4%)	1264 (1.2%)	
Non-English-speaking background	No	78589 (93.6%)	10341 (93.1%)	4108 (92.3%)	3691 (92.6%)	5419 (91.7%)	102148 (93.4%)	< 0.001
	Yes	5352 (6.4%)	770 (6.9%)	341 (7.7%)	296 (7.4%)	493 (8.3%)	7252 (6.6%)	
Patient/practice status	Existing patient	36378 (42.4%)	5103 (44.9%)	2049 (45.0%)	1510 (37.2%)	2025 (33.5%)	47065 (42.1%)	< 0.001
	New to registrar	43871 (51.2%)	5577 (49.1%)	2152 (47.2%)	2169 (53.4%)	3295 (54.5%)	57064 (51.1%)	
	New to practice	5490 (6.4%)	679 (6.0%)	357 (7.8%)	380 (9.4%)	721 (11.9%)	7627 (6.8%)	
Registrar sex	Male	34135 (38.8%)	3331 (28.6%)	1298 (27.8%)	1404 (33.7%)	1933 (31.2%)	42101 (36.7%)	< 0.001
	Female	53750 (61.2%)	8332 (71.4%)	3371 (72.2%)	2768 (66.3%)	4262 (68.8%)	72483 (63.3%)	
Registrar work status	Part-time	18479 (21.5%)	2689 (23.6%)	1144 (25.0%)	933 (22.9%)	1445 (23.7%)	24690 (22%)	0.031
	Full-time	67634 (78.5%)	8702 (76.4%)	3435 (75.0%)	3135 (77.1%)	4655 (76.3%)	87561 (78%)	
Worked at practice previously	No	63317 (73.0%)	8354 (72.7%)	3411 (74.0%)	3013 (73.4%)	4524 (74.2%)	82619 (73.1%)	0.24
	Yes	23411 (27.0%)	3130 (27.3%)	1196 (26.0%)	1093 (26.6%)	1577 (25.8%)	30407 (26.9%)	
Qualified as doctor in Australia	No	19762 (22.8%)	2601 (22.6%)	984 (21.3%)	949 (23.0%)	1306 (21.3%)	25602 (22.6%)	0.14
	Yes	66970 (77.2%)	8916 (77.4%)	3641 (78.7%)	3177 (77.0%)	4818 (78.7%)	87522 (77.4%)	
Practice size	Small	28796 (33.5%)	3847 (33.8%)	1564 (34.3%)	1435 (35.1%)	2072 (34.1%)	37714 (33.7%)	0.41
	Large	57171 (66.5%)	7528 (66.2%)	3002 (65.7%)	2652 (64.9%)	4008 (65.9%)	74361 (66.3%)	
Practice routinely bulk bills	No	71524 (81.9%)	9592 (82.8%)	3799 (81.8%)	3452 (83.3%)	4943 (80.5%)	93310 (82%)	0.073
	Yes	15776 (18.1%)	1987 (17.2%)	847 (18.2%)	691 (16.7%)	1195 (19.5%)	20496 (18%)	
Geographic location	Major city	52716 (60.0%)	6722 (57.6%)	2732 (58.5%)	2338 (56.0%)	3841 (62.0%)	68349 (59.6%)	0.76
	Inner regional	23893 (27.2%)	3352 (28.7%)	1299 (27.8%)	1190 (28.5%)	1645 (26.6%)	31379 (27.4%)	
	Outer regional/ remote/very remote	11276 (12.8%)	1589 (13.6%)	638 (13.7%)	644 (15.4%)	709 (11.4%)	14856 (13%)	

Variable	Class	0 tests	1 test	2–3 tests	4–5 tests	6–12 tests	Total	Univariate <i>P</i> *
Regional training provider	RTP 1	26857 (30.6%)	3800 (32.6%)	1516 (32.5%)	1419 (34.0%)	2019 (32.6%)	35611 (31.1%)	0.002
	RTP 2	10537 (12.0%)	1578 (13.5%)	615 (13.2%)	613 (14.7%)	704 (11.4%)	14047 (12.3%)	
	RTP 3	9251 (10.5%)	1299 (11.1%)	491 (10.5%)	435 (10.4%)	528 (8.5%)	12004 (10.5%)	
	RTP 4	40477 (46.1%)	4879 (41.8%)	2001 (42.9%)	1653 (39.6%)	2871 (46.3%)	51881 (45.3%)	
	RTP 5	763 (0.9%)	107 (0.9%)	46 (1.0%)	52 (1.2%)	73 (1.2%)	1041 (0.9%)	
Sought assistance	No	71061 (80.9%)	8970 (76.9%)	3395 (72.7%)	3149 (75.5%)	4772 (77.0%)	91347 (79.7%)	< 0.001
	Yes	16824 (19.1%)	2693 (23.1%)	1274 (27.3%)	1023 (24.5%)	1423 (23.0%)	23237 (20.3%)	
Imaging ordered	No	79775 (90.8%)	10485 (89.9%)	3696 (79.2%)	3205 (76.8%)	4789 (77.3%)	101950 (89%)	< 0.001
	Yes	8110 (9.2%)	1178 (10.1%)	973 (20.8%)	967 (23.2%)	1406 (22.7%)	12634 (11%)	
Learning goals generated	No	68580 (80.1%)	8556 (75.2%)	3015 (66.3%)	2705 (66.6%)	4054 (67.1%)	86910 (77.9%)	< 0.001
	Yes	16986 (19.9%)	2816 (24.8%)	1531 (33.7%)	1359 (33.4%)	1988 (32.9%)	24680 (22.1%)	
Follow-up ordered	No	44450 (50.6%)	3261 (28.0%)	944 (20.2%)	765 (18.3%)	1039 (16.8%)	50459 (44%)	< 0.001
	Yes	43435 (49.4%)	8402 (72.0%)	3725 (79.8%)	3407 (81.7%)	5156 (83.2%)	64125 (56%)	
Referral ordered	No	72437 (82.4%)	10266 (88.0%)	3905 (83.6%)	3456 (82.8%)	5045 (81.4%)	95109 (83%)	0.37
	Yes	15448 (17.6%)	1397 (12.0%)	764 (16.4%)	716 (17.2%)	1150 (18.6%)	19475 (17%)	
Chronic disease	No	65009 (74.0%)	8577 (73.5%)	2978 (63.8%)	2488 (59.6%)	3890 (62.8%)	82942 (72.4%)	< 0.001
	Yes	22876 (26.0%)	3086 (26.5%)	1691 (36.2%)	1684 (40.4%)	2305 (37.2%)	31642 (27.6%)	
Registrar age	Mean (SD)	32.9 (6.6)	32.9 (6.4)	32.7 (6.4)	32.8 (6.5)	33.0 (6.6)		0.64
Index of Relative Socio-economic Disadvantage decile	Mean (SD)	5.5 (2.9)	5.4 (2.8)	5.5 (2.8)	5.3 (2.8)	5.5 (2.9)		0.80
Consultation duration	Mean (SD)	16.0 (8.6)	19.5 (9.3)	21.1 (9.5)	21.2 (9.7)	22.5 (10.2)		< 0.001
Number of problems	Mean (SD)	1.4 (0.7)	1.8 (0.9)	2.0 (1.0)	2.0 (1.0)	2.1 (1.0)		< 0.001

\* Obtained by fitting a model for each variable and adjusting for time.

**Table 2. Adjusted associations with number of pathology tests ordered: results of zero-inflated negative binomial multiple regression**

Variable	Class	Incidence rate ratio (95% CI)	<i>P</i>
Time	Mean (SD)	1.04 (1.01–1.07)	0.016
Patient age group	0-14	1	
	15-34	2.53 (2.25–2.84)	< 0.001
	35-64	2.37 (2.11–2.66)	< 0.001
	65+	2.07 (1.82–2.34)	< 0.001
Patient sex	Female	0.92 (0.89–0.96)	< 0.001
Non English Speaking Background	Yes	1.05 (0.98–1.13)	0.19
Patient/practice status	Not a new patient	1	
	New to registrar	1.34 (1.28–1.40)	< 0.001
	New to practice	1.59 (1.48–1.70)	< 0.001
Practice bulk bills	Yes	1.01 (0.94–1.08)	0.79
Geographic location	Referent: major city		
	Inner regional	1.00 (0.94–1.07)	0.95
	Outer reg/remote/very remote	1.04 (0.94–1.14)	0.48
Regional training provider	RTP 1	1	1
	RTP 2	0.92 (0.85–1.00)	0.05
	RTP 3	0.91 (0.83–1.00)	0.05
	RTP 4	1.06 (0.99–1.13)	0.10
	RTP 5	1.17 (0.82–1.65)	0.39
Sought assistance	Yes	0.85 (0.81–0.90)	< 0.001
Imaging ordered	Yes	1.39 (1.32–1.45)	< 0.001
Learning goals	Yes	1.19 (1.13–1.24)	< 0.001
Follow-up ordered	Yes	1.43 (1.35–1.52)	< 0.001

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Referral ordered	Yes	1.12 (1.06–1.18)	< 0.001
Chronic disease	Yes	1.09 (1.04–1.14)	< 0.001
Index of Relative Socio-economic Disadvantage	Mean (SD)	1.01 (1.00–1.02)	0.14
Consultation duration	Mean (SD)	1.00 (1.00–1.01)	0.0036
Number of problems	Mean (SD)	1.14 (1.11–1.16)	< 0.001

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