

APPENDIX 5 (as supplied by the authors): Sensitivity analyses and additional investigations

Multiple sensitivity analyses and additional investigations were conducted to support the main findings. Two sensitivity analyses were performed to further assess the segmented regression of recent graduate surgical rates. In the first, data from 2006 were excluded as this year may have been an outlier. In this analysis, as in the primary analysis, the mean cataract surgery rate among recent graduates decreased by 49.62 (95% CI: 34.28 to 64.96) operations/quarter in January 2007. In the second sensitivity analysis, surgeons in the recent graduates group were not transitioned into the established surgeon group, but instead excluded after their period as a recent graduate. In this sensitivity analysis, as in the primary analysis, the mean cataract surgery rate among established ophthalmologists did not show a significant change in level at January 2007 (level change coefficient = 3.09 [95% CI: -4.47 to 10.65] operations/quarter) and the trend in cataract surgery rates among established ophthalmologists slowed by 1.12 (95% CI: 0.70 to 1.54) cases/quarter after January 2007. By definition this sensitivity analysis did not affect the recent graduate results.

In contrast to cataract surgery, decreases in service provision among recent graduates did not occur for the less resource-intensive, non-volume-controlled services evaluated (Appendix Figures A5-1 and A5-2). Specifically, the trend in mean consultation rate among recent graduates increased by 5.02 (95% CI: 2.67 to 7.37) consultations/quarter

from 2007 onward, with no significant shift in the level of the consultation rate at the beginning of 2007. Similarly, the trend in mean laser iridotomy procedure rate among recent graduates increased by 0.63 (95% CI: 0.20 to 1.06) procedures/quarter from 2007 onward, with no significant shift in the level of the procedure rate at the beginning of 2007.

To confirm that a trend towards subspecialization among recently graduated physicians did not confound the analysis, we examined the proportion of ophthalmologists providing subspecialized surgery. Significant trends toward subspecialization were not observed among either recent graduates or established physicians. In particular, surgeons who exclusively performed cataract surgery, and none of the subspecialty procedures, formed the majority of both groups and the percentage providing exclusively cataract surgery increased in both groups over the study period (Appendix Table A5-1). Appendix Table A5-1 provides details regarding the proportions of surgeons providing exclusive cataract surgery and subspecialized surgery in both the recent graduate and established ophthalmologist groups.

Finally, Appendix Figure A5-3 shows the median percentage of cataract operations performed by recent graduates across Ontario Local Health Integration Networks. The percentage of cases performed by recent graduates showed some regional variation, with a decrease observed in many but not all regions during the later time period.

Figure A5-1. Mean quarterly number of consultations among recent graduates and established physicians, 1994-2013.

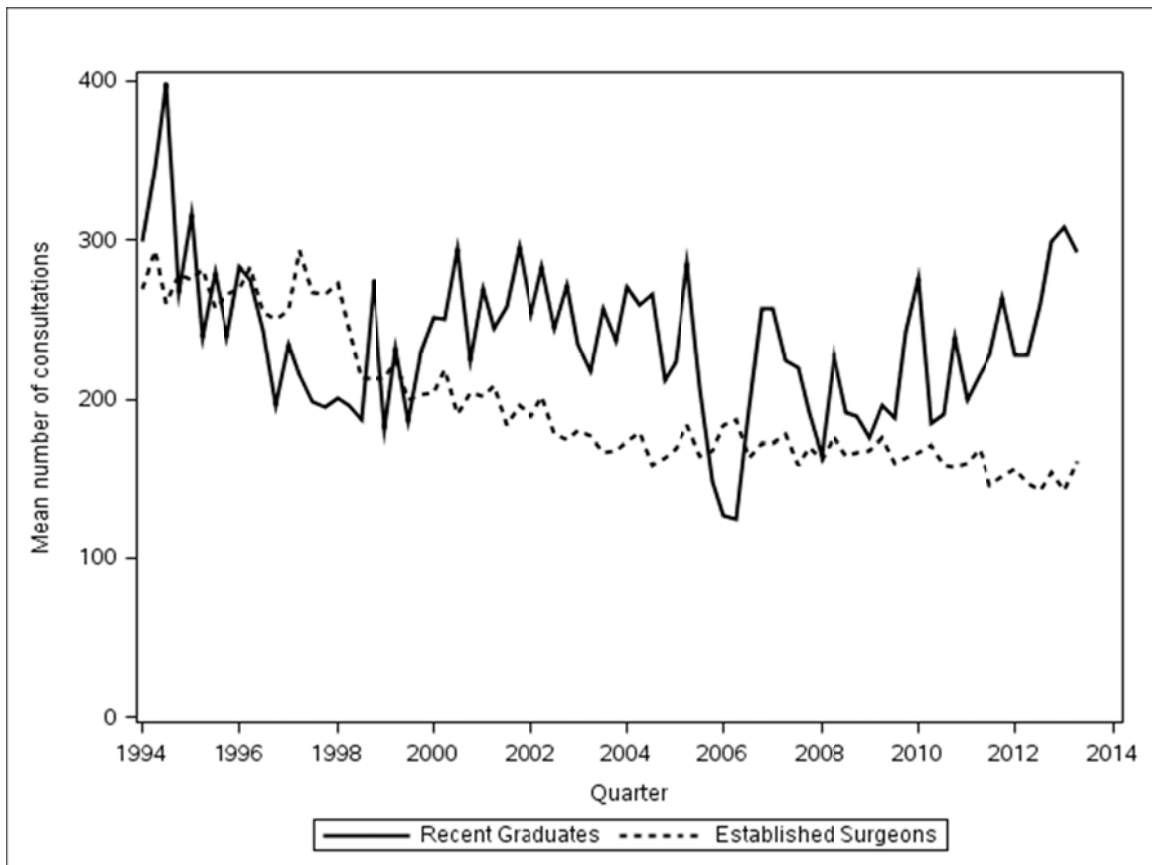


Figure A5-2. Mean quarterly number of laser peripheral iridotomy procedures among recent graduates and established physicians, 1994-2013.

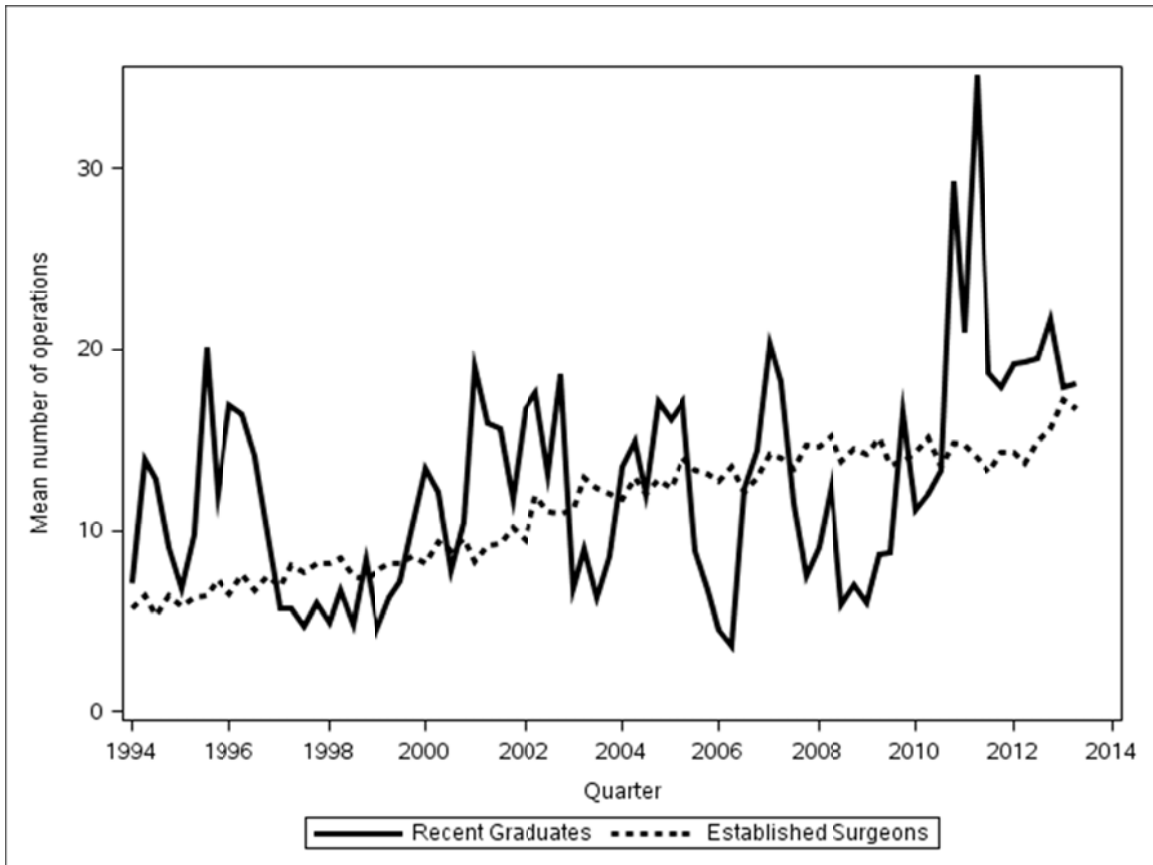


Table A5-1.

Percentages of ophthalmologists providing surgery at beginning and end of study period and Cochrane-Armitage trend test by area of surgical practice

	1994%	2012%	C-A p-value*
Recent Graduates			
Exclusive cataract	42	65	<.0001
Cornea	0	10	-
Glaucoma	14	10	0.339
Orbit	3	0	-
Retina	6	10	0.907
Strabismus	0	5	-
Established Ophthalmologists			
Exclusive cataract	52	61	0.009
Cornea	4	5	0.851
Glaucoma	10	8	0.155
Orbit	2	3	0.086
Retina	5	8	0.217
Strabismus	8	5	0.148

* Cochrane-Armitage (C-A) test not applied to subspecialties with very small numbers of surgeons and multiple years with no surgeons in the category.

Figure A5-3. Median annual percentage of cataract operations performed by recent graduates within each Ontario Local Health Integration Network (LHIN) 1994-2006 versus 2007-2013. The absence of a bar means no recent graduates performed cataract surgery in the period.

