A Comparison of Performance of Therapeutic Procedures by Ophthalmologists and Optometrists in States with Expanded Scope of Practice

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BACKGROUND

- Optometrists in the states of Oklahoma (OK), Kentucky (KY), and New Mexico (NM) are permitted to perform injections, minor surgical procedures and laser procedures (OK and KY).
- They may obtain certificates to legally do so by attending abbreviated procedure courses.[1]
- The ACGME mandates that all graduating ophthalmology residents in the United States perform minimum numbers of these procedures.
- One argument for expansion of scope of optometric practice is to improve access to eye care for rural populations that lack access to ophthalmologists (and may otherwise go without care).
- It is unclear how frequently optometrists and ophthalmologists are performing such procedures.
- This has important implications for future policy decisions regarding optometric scope of practice.

PURPOSE

- To determine numbers, types and geographic distribution of ophthalmic procedures performed by optometrists and ophthalmologists in OK, KY and NM

METHODS

Data Source

- Medicare claims database – nationally representative 20% sample of claims of beneficiaries undergoing a range of common ophthalmic procedures between Jan. 1, 2008 and Dec. 31, 2014

Inclusion Criteria

- Beneficiaries in Oklahoma, Kentucky and New Mexico who underwent one or more of the following 10 procedures, tracked by Current Procedural Terminology (CPT) codes: Injection (Intraocular or periocular), Punctal procedure, Chalazion excision, Laser trabeculoplasty (LTP), Laser peripheral iridotomy (LPI), Eyelash epilation, Superficial foreign body removal, Nd:YAG laser capsulotomy, Eyelid abscess drainage, Excision of eyelid lesion

Exclusion

- Individuals <65 years old or >95 years old
- Those enrolled in Medicare Advantage plans
- Procedures that were submitted for payment but not paid
- States that passed expanded scope of practice legislation after the start of the study period (Louisiana)

Analysis

- Summary statistics of beneficiary characteristics were generated for each provider class within each state.
- For each eye care provider identified by NPI, we determined the number of procedures of interest performed. By state and provider class, we computed the percentage of all procedures of interest performed by the most active 1% and 5% of providers and what percentage of providers performed no procedures.
- We created three multivariable logistic regression models: one corresponding to each of the states studied. The outcome of interest was odds of receiving any of the procedures of interest by an optometrist (versus by an ophthalmologist).
- Covariates in all three models were calendar year that procedure was performed, sex, race, urban versus rural residence, age and Charlson Comorbidity Index (CCI) score.[2]
- All regression models generated odds ratios (OR) and 95% confidence intervals (CI).

RESULTS

Characteristics of study sample

Row Percentages	Oklahoma				Kentucky				New Mexico			
	Procedures performed				Procedures performed				Procedures performed			
	Optometrist		Ophthalmologist		Optometrist		Ophthalmologist		Optometrist		Ophthalmologist	
	n	Percent	n	Percent	n	Percent	n	Percent	n	Percent	n	Percent
Total	10014	17.3	47950	82.7	3904	6.2	59355	93.8	1263	5.8	20431	94.2
Year												
2008	1420	20.1	5654	79.9	520	7.5	6410	92.5	192	7.9	2249	92.1
2009	1525	19.9	6142	80.1	472	6.2	7108	93.8	156	6.3	2318	93.7
2010	1401	18.8	6037	81.2	419	5.0	7904	95.0	187	6.7	2602	93.3
2011	1355	17.0	6623	83.0	445	4.8	8771	95.2	174	5.7	2870	94.3
2012	1397	16.0	7345	84.0	651	6.4	9582	93.6	180	5.4	3163	94.6
2013	1462	16.0	7698	84.0	684	6.5	9785	93.5	203	5.2	3671	94.8
2014	1454	14.7	8451	85.3	713	6.8	9775	93.2	171	4.6	3558	95.4
Sex												
Male	3806	17.9	17481	82.1	1614	6.9	21720	93.1	525	6.0	8228	94.0
Female	6208	16.9	30469	83.1	2290	5.7	37615	94.3	738	5.7	12203	94.3
Race												
White	8824	17.0	42994	83.0	3760	6.2	57180	93.8	1055	5.5	18302	94.5
Non-white	1190	19.4	4956	80.6	144	6.3	2155	93.7	208	8.9	2129	91.1
Community												
Urban	3966	13.0	26592	87.0	1298	4.5	27758	95.5	363	2.8	12398	97.2
Large rural	2721	19.7	11066	80.3	897	5.9	14319	94.1	606	9.8	5598	90.2
Small rural	3327	24.4	10292	75.6	1709	9.0	17258	91.0	294	10.8	2435	89.2
Age (mean/SD) [a]	75.7	49.4	77.4	50.6	73.8	48.9	77.1	51.1	71.4	47.7	78.2	52.3
CCI[b] (mean/SD) [a]	6.2	48.1	6.7	51.9	6.0	46.5	6.9	53.5	5.4	45.4	6.5	54.6

In **large rural** and **small rural communities**, respectively:

- In **OK**, **ophthalmologists** performed **80%** and **76%** of procedures
- In **KY**, **ophthalmologists** performed **94%** and **91%** of procedures
- In **NM**, **ophthalmologists** performed **90%** and **89%** of procedures

Abbreviations / Footnotes

Optom = Optometrist
Ophthal = Ophthalmologist
a) SD = Standard Deviation
b) CCI = Charlson Comorbidity Index[2]
c) LTP = Laser trabeculoplasty
d) LPI = Laser peripheral iridotomy
e) FB = Foreign body
f) YAG = Nd:YAG capsulotomy

Odds of Receiving a Procedure by an Optometrist in the 3 states During 2008-2014

Oklahoma

	Odds Ratio	95% Confidence Interval		*P* value
Calendar year	0.995	0.985	1.005	0.35
Male	1.045	0.980	1.114	0.18
Non-white race	1.152	1.048	1.267	0.003
Rural residence	1.738	1.625	1.859	<.0001
Age	0.991	0.987	0.994	<.0001
CCI[b]	0.950	0.939	0.961	<.0001

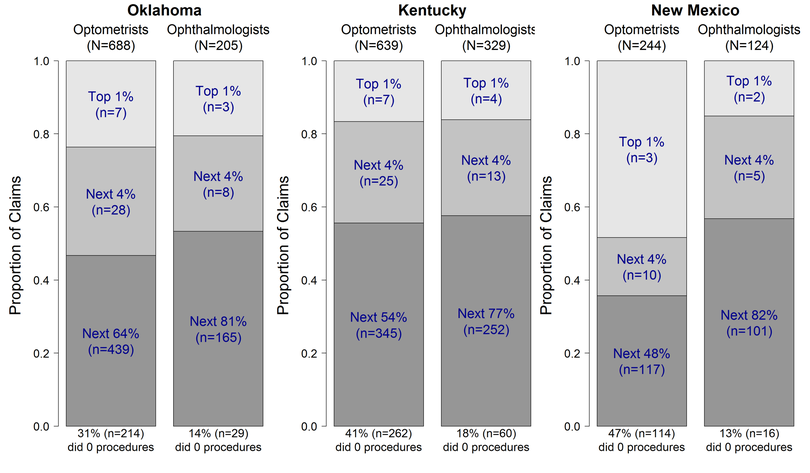
Kentucky

	Odds Ratio	95% Confidence Interval		*P* value
Calendar year	1.041	1.025	1.056	<.0001
Male	1.292	1.180	1.415	<.0001
Non-white race	0.896	0.714	1.123	0.34
Rural residence	1.474	1.343	1.616	<.0001
Age	0.984	0.979	0.989	<.0001
CCI[b]	0.942	0.9265	0.9574	<.0001

New Mexico

	Odds Ratio	95% Confidence Interval		*P* value
Calendar Year	1.009	0.985	1.035	0.47
Male	1.062	0.887	1.271	0.51
Non-white race	0.940	0.728	1.212	0.63
Rural residence	2.783	2.329	3.325	<.0001
Age	0.959	0.951	0.967	<.0001
CCI[b]	0.932	0.901	0.964	<.0001

Proportion of Eye Care Providers in the 3 States Responsible for Performing the Ocular Procedures of Interest



Procedure types by Optometrists and Ophthalmologists (Total numbers, 2008-2014)

	Oklahoma		Kentucky		New Mexico	
Procedure	**Optom**	**Ophthal**	**Optom**	**Ophthal**	**Optom**	**Ophthal**
Injection	59	32277	5	36897	9	14712
Punctal procedures	1178	2033	658	2258	616	859
LTP[c]	438	1725	54	2196	0	343
LPI[d]	88	446	30	1043	3	187
Eyelash epilation	2211	1298	1672	2321	403	744
FB removal[e]	749	331	733	644	203	218
Chalazion	180	720	31	782	16	257
YAG[f]	5031	8805	713	12497	10	2965
Eyelid abscess	87	48	13	113	6	13
Lid lesion	55	479	21	849	2	208

DISCUSSION

Key Findings:

1) Optometrists practicing in states with expanded scope of practice performed many fewer procedures than ophthalmologists practicing in those states.
2) Factors associated with higher odds of receipt of procedures by optometrists rather than ophthalmologists include younger age, better overall health, and residence in rural parts of the state.
3) Ophthalmologists perform the large majority (76-94%) of procedures for patients residing in rural areas of these states
4) Of all procedures performed by optometrists, many were performed in patients residing in urban areas: OK (40%), KY (33%) and NM (29%).
5) A small number of eye care providers are performing a large proportion of the procedures of interest. This is particularly notable for NM, where the top 3 optometrists performed 49% of all procedures done by optometrists throughout the entire state.
6) For some of the procedures of interest such as periocular and intraocular injections, optometrists are performing very few procedures.

Further discussion:

- Persons residing in rural communities in all 3 states had higher odds of receiving procedures by optometrists.
- Yet, over three quarter of the procedures done on persons in large and small rural communities in the 3 states were performed by ophthalmologists. Moreover, a large percentage of optometrist-performed procedures were done on patients residing in urban areas of these states.
- These findings raise questions as to whether legislation expanding scope of surgical practice for optometrists in these states is achieving its intended benefit of rural expansion of care.
- Surgeon volume has been strongly associated with improved patient outcomes in many surgical disciplines.[3]
- If optometrists are performing so few of these more complex surgical procedures, (e.g. 73 injections in all 3 states over the study period (2008-2014)) it is unclear whether optometrists are doing these procedures frequently enough to maintain competency.

Study Limitations:

- Claims data lack info on clinical variables - we are unable to determine clinical outcomes of procedures done by the 2 groups.
- Although we adjusted our regression model for covariates such as age, race, sex and residence, there are other possible unmeasured confounders that were not included in the model.

Conclusions and Implications:

- Based on these results, policy makers should reassess whether the purported benefits of expansion in surgical scope of practice outweigh the potential downsides.
- Additional research is needed to explore whether differences exist in surgical outcomes between the 2 groups.
- These results can help guide decision making regarding expansion of scope of practice in other states.

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