Demographic and Practice Variations between Medical and Surgical Retina Specialists in the United States

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Disclosures

- I have no disclosures or conflicts of interests related to this presentation
- This presentation discusses off-label use of Bevacizumab

Summary

- The demographic, geographic, and practice differences between medical (MR) and surgical retina (SR) specialists in the United States are not well quantified
- This study identified self-reported retina specialists in a 2017 Medicare Dataset and distinguished MR from SR using billing codes; these data were combined with demographic and disease data from the ABO, IRS, CDC, and Census Bureau
- 984 (48%) MR, 1065 (52%) SR identified; females 8.0% SR vs. 23.4% MR
- Odds of practicing SR decreased with age (OR 0.98, $p<0.001$), practice location in Mid-Atlantic (OR 0.59, $p=0.002$) or New England (OR 0.49, $p=0.002$) census regions
- Odds of practicing SR increased in the Mountain (OR 1.78, $p=0.01$), East South Central (OR 2.11, $p=0.002$), and West North Central (OR 1.81, $p=0.01$) census regions
- SR outnumbered MR in counties with elderly population (OR 1.31, $p=0.005$) but population, income, and diabetes prevalence were not associated with this outcome
- SR billed more office visits (2204 vs 1368, $p<0.001$) and performed more anti-VEGF injections (1736 vs. 842, $p<0.001$), imaging tests (3630 vs 2136, $p<0.001$), and medical laser (69 vs. 64, $p=0.001$) than MR
- SR were more likely to perform extended ophthalmoscopy (1.26, $p=0.02$) and laser for retinal tear (OR 4.26, $p<<0.001$); no MR performed cryoretinopexy or pneumatic retinopexy in this study
- Conclusion: By combining large public databases, new insight into the US retinal care workforce is possible. There are significant demographic and practice differences between MR and SR; the causes are likely multifactorial, and public health implications merit further investigation.

Introduction

- Recent advances in medical therapies and diagnostic modalities have transformed management of many retinal diseases, augmenting the role of medical management in retinal disease
- Retina specialists will have undergone either a medical retina (MR) or surgical retina (SR) fellowship
- Small survey data suggest age, gender, practice differences between different types of retina specialists, despite significant overlap in training
- This study combined publicly available data from Centers for Medicare and Medicaid Services (CMS), American Society of Retina Specialists (ASRS), American Board of Ophthalmology (ABO), US Census Bureau, Internal Revenue Service (IRS), Centers for Disease Control (CDC) data to better quantify real world differences in physician demographics, patient characteristics, and practice patterns between MR and SR

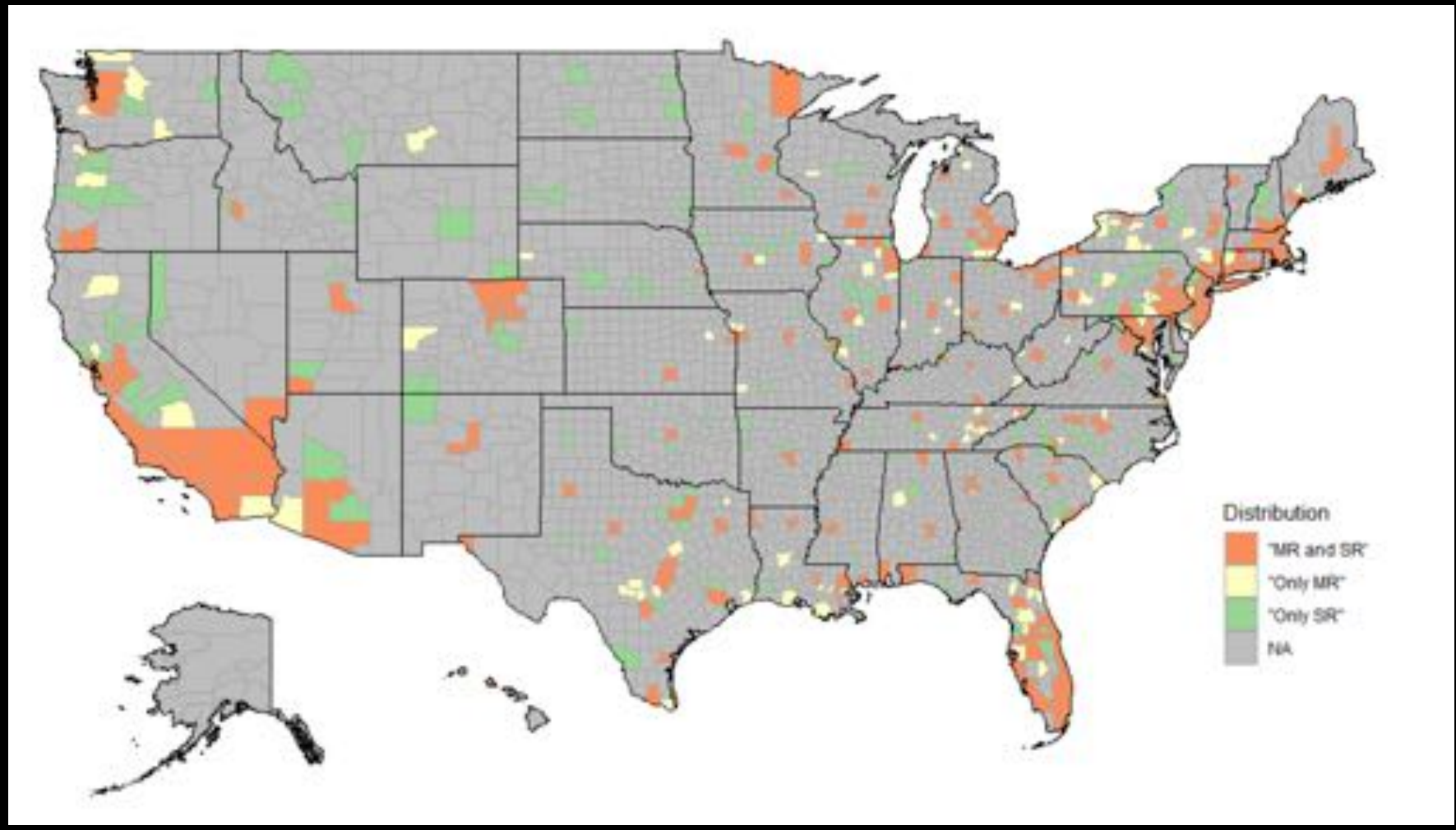
Methods

- Retina specialist = voluntary “retina specialist” designation with CMS and/or member of ASRS
- Considered SR if performing operating-room based procedure (e.g. PPV, SB) on >10 Medicare beneficiaries in 2017, else MR
- Name, zip code, and NPI used to link to other public databases
- Procedures studied:
  - Intravitreal anti-VEGF injections (Aflibercept, Bevacizumab, Ranibizumab)
  - Focal/macular laser, PDT, PRP
  - Laser/cryo/pneumatic retinopexy, ext. ophthalmoscopy
  - Endophthalmitis treatment (intravitreal antibiotics, vitreous aspiration)
  - OCT, fundus photography, FA, ICG, B-scan

Multivariate logistic regression of physician characteristics predicting practice as a surgical retina specialist

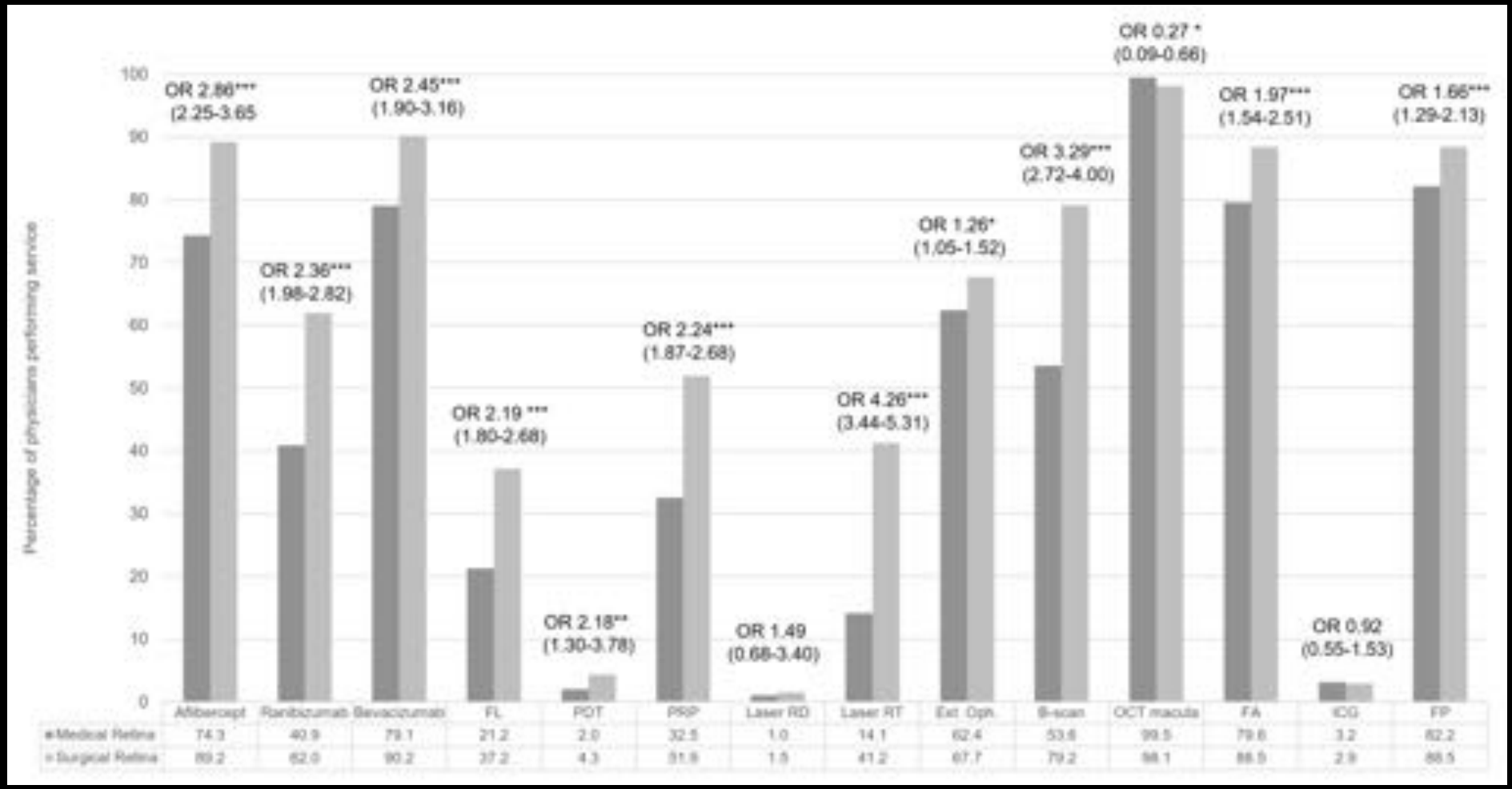
Physician Characteristics	OR (95% CI)	P-Value
Gender		
Female	0.26 (0.19 – 0.34)	<0.001
Board Certification		
Each year since initial board certification	0.98 (0.97-0.99)	<0.001
Census Region		
East North Central (IL, IN, OH, MI, WI)	Ref	Ref
East South Central (AL, KY, MS, TN)	2.11 (1.33 – 3.41)	0.002
Mid Atlantic (NJ, NY, PA)	0.59 (0.42 – 0.83)	0.002
Mountain (AZ, CO, ID, MT, NM, NV, UT, WY)	1.78 (1.15 – 2.79)	0.011
New England (CT, MA, ME, NH, RI, VT)	0.49 (0.31 – 0.77)	0.002
Pacific (AK, CA, HI, OR, WA)	0.72 (0.51 – 1.02)	0.063
South Atlantic (DC, DE, GA, FL, MD, NC, SC, VA, WV)	0.88 (0.64 – 1.19)	0.396
West North Central (KS, IA, MN, MO, ND, NE, SD)	1.81 (1.16 – 2.86)	0.010
West South Central (AR, LA, OK, TX)	0.93 (0.65 – 1.34)	0.713

Choropleth map of US counties with only MR, only SR, or both



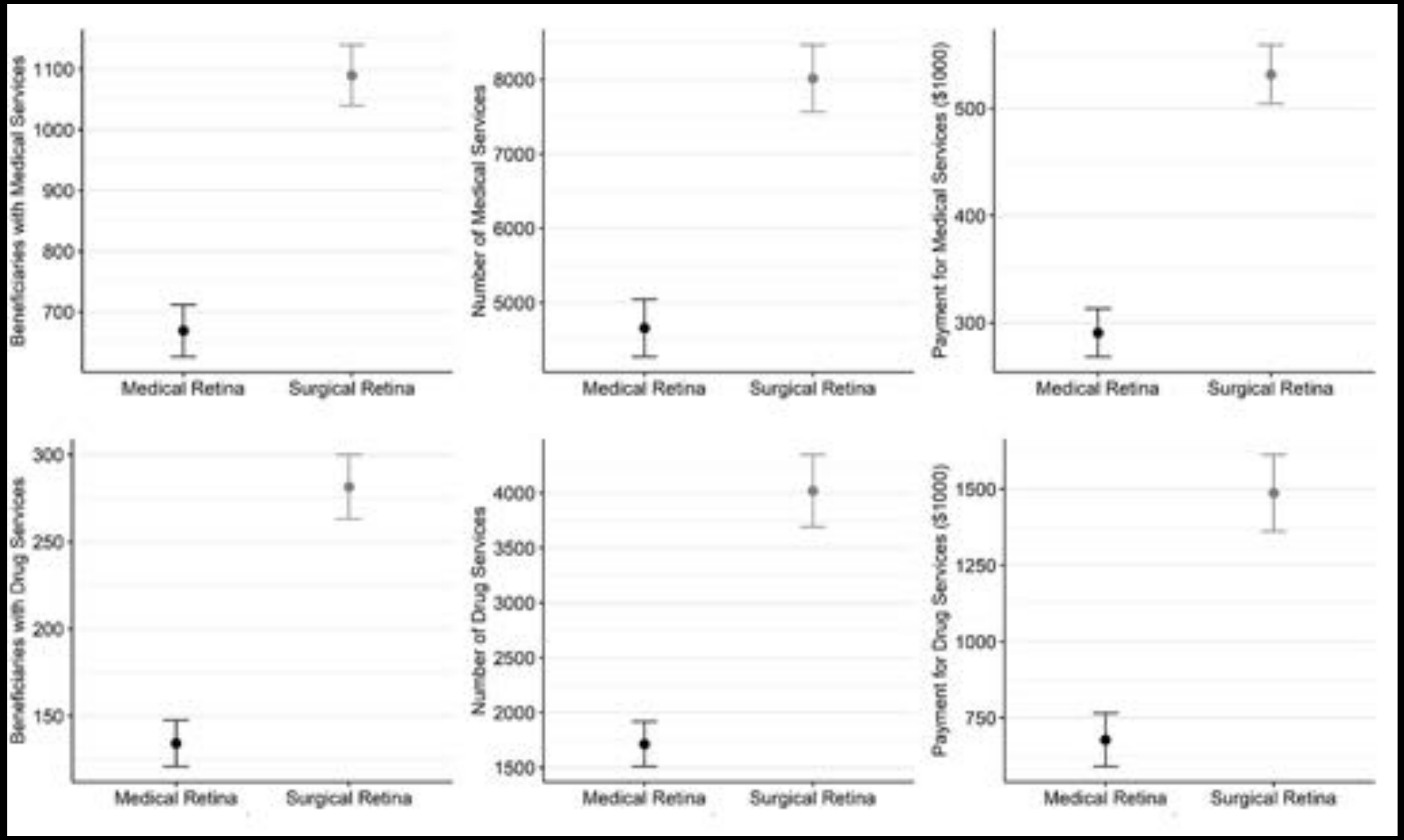
Percentage of MR and SR performing each retinal procedure

P-Value: *<0.05, **<0.01, ***<0.001



Clinical productivity metrics between MR and SR

Horizontal bars represent 95% confidence interval around the mean



Aggregate patient characteristics of MR and SR

Significance threshold adjusted to account for multiple comparisons (Benjamini-Hoschberg)

Patient Characteristics	Medical Retina	Surgical Retina	
	Mean (SD)	Mean (SD)	P-value
Age			
Average age (years)	75.5 (2.8)	75.9 (2.1)	0.104
Age ≥75 (%)	53.4 (9.6)	55.1 (7.1)	0.060
Comorbidities			
Arthritis	40.6 (5.6)	40.4 (4.6)	0.395
Asthma	6.8 (1.9)	6.2 (1.5)	<0.001
Atrial fibrillation	12.2 (3)	12.8 (2.2)	0.017
Cancer	10.6 (2.4)	10.4 (1.8)	0.058
Chronic kidney disease	36.8 (7.7)	35.0 (5.6)	0.003
Chronic obstructive pulmonary disease	13.1 (3.4)	13.4 (3)	0.176
Dementia	11.4 (2.8)	10.8 (2)	0.009
Depression	18.6 (4)	18.3 (3)	0.370
Diabetes	43.2 (10.9)	39 (7.1)	<0.001
Heart Failure	20.1 (4.2)	19.7 (3.5)	0.337
Hyperlipidemia	53.2 (8.4)	52.2 (7.9)	0.128
Hypertension	71.0 (5.4)	71.0 (5.1)	0.910
Ischemic cardiomyopathy	36.6 (6.3)	36.4 (5.6)	0.955
Osteoporosis	9.9 (2.6)	9.0 (2.1)	<0.001
Schizophrenia	1.9 (1.2)	1.4 (0.6)	<0.001
Stroke	5.7 (1.6)	5.3 (1.2)	0.009
Composite			
Hierarchical Composite Score	1.61 (0.29)	1.55 (0.19)	0.007

Discussion

- MR and SR are not equally geographically or demographically distributed
- MR patients are have more medical comorbidities
- SR are more clinically productive, even with regards to medical retina services
- MR are less likely to perform in-office retinal repair procedures, despite being technically qualified to do so
- Understanding the reasons for these differences will be necessary to ensure equal access to high quality retina care in the present and future