

Association Between Geographic Distribution of Eye Care Clinicians and Visual Impairment in California

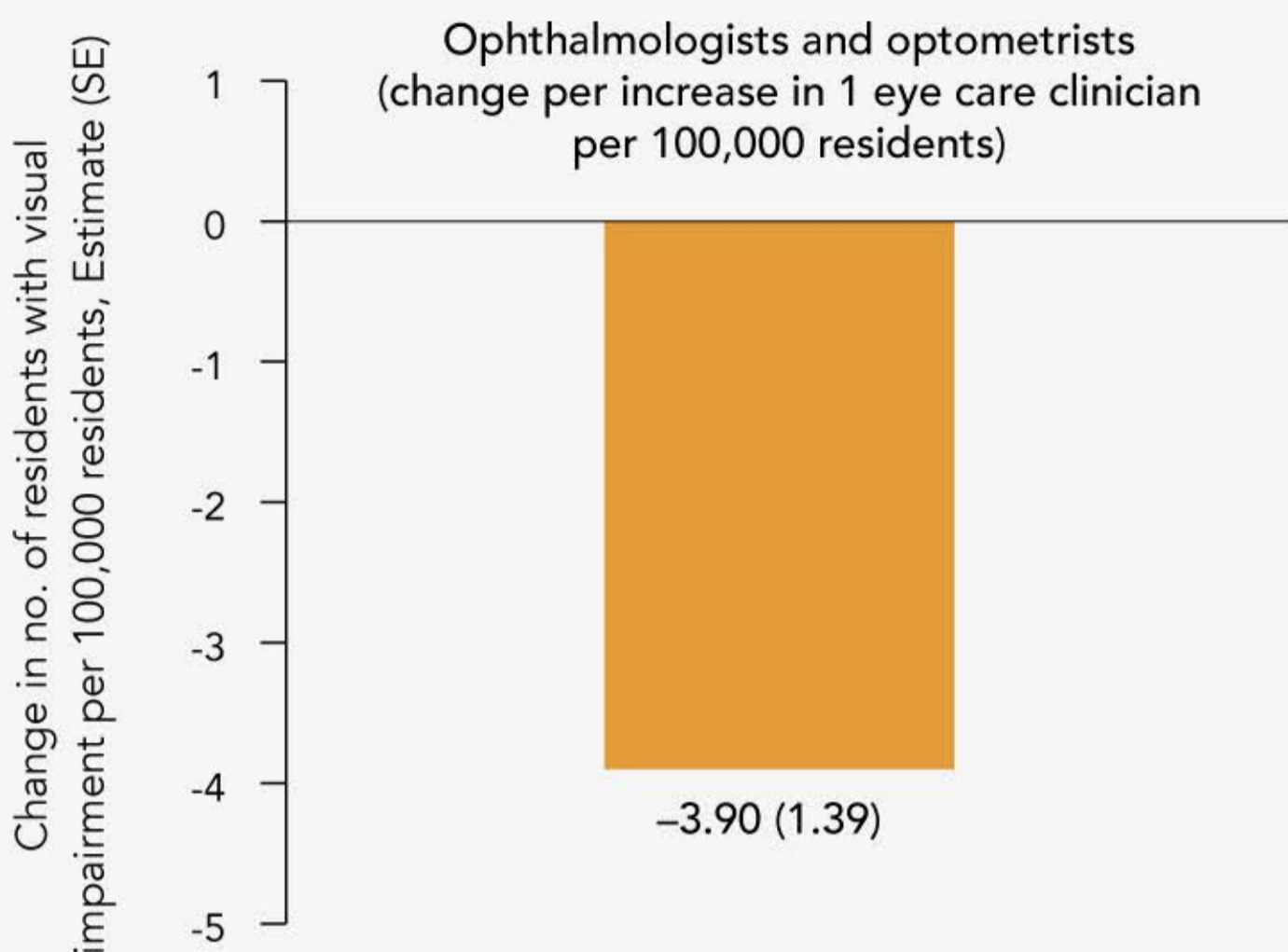
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Approximately 4.24 million people in the US were visually impaired in 2015, and this number is projected to double by 2050. Risk factors for low vision and visual impairment include older age, female sex, lower education level, and rural residence. One potential risk factor that has not been well studied is the availability of eye care clinicians. A researcher examined the geographic distribution of eye care clinicians in the US and reported that 24% of US counties had no ophthalmologists or optometrists. Another group of researchers estimated that one-third of participants in the Behavioral Risk Factor Surveillance System survey did not visit an eye care clinician in a 1-year period.

The aim of this study was to examine associations between the geographic distribution of eye care clinicians and visual impairment in California.



In this cross-sectional study including more than 30 million residents of California, a higher number of ophthalmologists and optometrists was associated with decreased prevalence of visual impairment.



When adjusting for all covariates, there was a mean (SE) decrease of 3.90 (1.39) persons with visual impairment per 100,000 residents for the increase of every 1 eye care clinician per 100,000 residents.

SE = standard error.



Previous studies have provided support for the positive or negative associations between demographic factors and visual impairment.

Previous study results included:



Men were more likely to have glaucoma.



Lower socioeconomic status was associated with worse visual outcomes.



Children from families earning less than the federal poverty level had nearly double the likelihood of visual impairment.



The prevalence of visual impairment was associated with earning less than 150% of the federal poverty level.



This study has several limitations.



Medical Service Study Areas (MSSAs) are defined in relation to primary care clinicians, and this study borrows the MSSA designation for eye care clinicians. Further study is needed to determine if an alternate classification should be used to geographically categorize ophthalmologists and optometrists.



Data were collected in different years, it may not reflect the exact association between eye care clinicians and visual impairment at a given time point.



The American Academy of Ophthalmology (AAO) membership data do not include nonmember ophthalmologists, and there is a possibility of ophthalmologists present in areas that had been noted as having zero ophthalmologists. Another consideration is that with recent advances in telemedicine, eye care clinicians may reach patients outside of their practice ZIP Codes™.



New artificial intelligence devices being used to detect diabetic retinopathy may decrease the association of the prevalence of visual impairment and eye care clinicians, since these devices increase access to diabetic retinopathy screening.



Conclusions

In summary, this study found associations between increased number of eye care clinicians and decreased prevalence of visual impairment in California after adjusting for demographic and socioeconomic factors. Further studies are needed to investigate reasons for these associations, as well as strategies to improve access to eye care and reduce visual impairment in the population and determine whether these results can be generalized to areas outside of California.