Re: Lee et al.: Evaluating access to eye care in the contiguous United States by calculated driving time in the United States Medicare population (Ophthalmology. 2016;123:2456-2461)

TO THE EDITOR: Lee et al1 state, “Our findings contrast with the results of Gibson,” who analyzed 3143 counties in the United States and found that 24.1% of the counties were in the lower 2 quartiles of ophthalmologist availability but in the upper 2 quartiles of optometrist availability.” Gibson created population-weighted quartiles of the county-level number of ophthalmologists per capita and the county-level number of optometrists per capita. Lee et al maintain that “this method of analysis grossly underestimates availability.” This letter argues that Lee et al did not support these assertions and notes that it has not been established that driving time to the closest eye care provider, the measure of provider availability used by Lee et al,1 is a better predictor of vision health outcomes than other measures of the availability of eye care providers.

To the first point, Lee et al1 did not present findings about the number of geographic areas with a combination of “lower” ophthalmologist availability and “higher” optometrist availability or the percentage of the population that lived in these types of areas; therefore, it is not possible to directly compare their findings with those of Gibson.2 Additionally, Lee et al1 presented no empirical evidence to support the statement that provider density measures grossly underestimate availability. Their critique that county-level provider density measures do not consider the proximity of ophthalmologists and optometrists in neighboring counties is well-taken and is also mentioned as a caveat by Gibson,2 but the validity of this point does not necessarily mean that county-level provider density measures grossly underestimate availability.

Lee et al1 estimated that >90% of US Medicare beneficiaries lived within a 30-minute drive of an ophthalmologist and within a 15-minute drive of an optometrist. Driving time may be misestimated for some residents of rural areas, because census block groups can be very large in rural areas and the estimates of Lee et al1 are based on the distance from the geographic center of an individual’s census block group of residence rather than on the distance from the precise location of an individual’s residence. Drawing on 2010 decennial census data to provide examples of the frequency and geographic distribution of large census block groups, 97 of 413 block groups in Wyoming, 941 of 15814 block groups in Texas, and 310 of 4489 block groups in Wisconsin were >50 square miles. Based on 2010 decennial census data, 22.4% of the US population aged ≥65 years lived in a rural area.

The number of providers per capita in a geographic area can be thought of as a rough measure of both provider proximity and provider capacity. Driving time to the closest eye care provider does not capture the capacity of providers to take on additional patients or to see existing patients in a timely fashion. Lee et al could use their data to create a measure of eye care provider capacity by calculating for each US Medicare beneficiary how many other Medicare beneficiaries had the same closest provider. They could examine how this measure varied for residents of different regions of the country and for residents of rural and urban areas, and they could examine the extent to which the driving time and provider capacity measures offered consistent views on the degree of eye care provider availability.

Previous research in the United States has found that measures of eye care providers per capita were significantly associated with vision health outcomes in empirical models that included a large set of controls for individual and contextual characteristics, providing evidence on the predictive validity of provider density as a measure of the availability of eye care providers.3-5 Although it stands to reason that driving time measures of eye care provider availability would be similarly associated with vision health outcomes, to my knowledge this association has yet to be examined. Until the superior predictive validity of driving times has been established, the question of which measure is the best measure of the availability of eye care providers remains unsettled.

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References