

Vision Health Disparities in the United States by Race/Ethnicity, Education, and Economic Status: Findings From Two Nationally Representative Surveys

Zhang X, Cotch MF, Ryskulova A, et al. *Am J Ophthalmol.* 2012;154:S53-S62.e1.
doi: 10.1016/j.ajo.2011.08.045

This study used national survey data from the National Health and Nutrition Examination Survey (NHANES) and the National Health Interview Survey (NHIS). Main outcome measures included, from NHANES, age-related eye diseases (ie, age-related macular degeneration [AMD], cataract, diabetic retinopathy [DR], glaucoma) and from NHIS, eye care use (ie, eye doctor visits and affordability of eye glasses when needed) among those with self-reported visual impairment. The estimates were age- and sex-standardized to the 2000 US Census population. Linear trends in the estimates were assessed by weighted least squares regression.

Differences by ethnicity were observed in the prevalence of certain eye diseases

Non-Hispanic whites had a higher prevalence of AMD and cataract surgery than non-Hispanic blacks, but a lower prevalence of DR and glaucoma (all $P < .001$ in NHANES 2005-2008).

From 1999 to 2008, individuals with less education (ie, <high school vs >high school) and lower income (poverty income ratio [PIR] <1.00 [with 1.00 defined as the official federal poverty threshold level] vs >4.00) were consistently less likely to have had an eye care visit in the past 12 months compared with their counterparts (all $P < .05$). During this period, inability to afford needed eyeglasses increased among non-Hispanic whites and Hispanics (trend $P = .004$ and $P = .007$; respectively), those with high school education (trend $P = .036$), and those with PIR 1.00-1.99 (trend $P < .001$).

Differences by educational attainment were observed in the prevalence of certain eye diseases

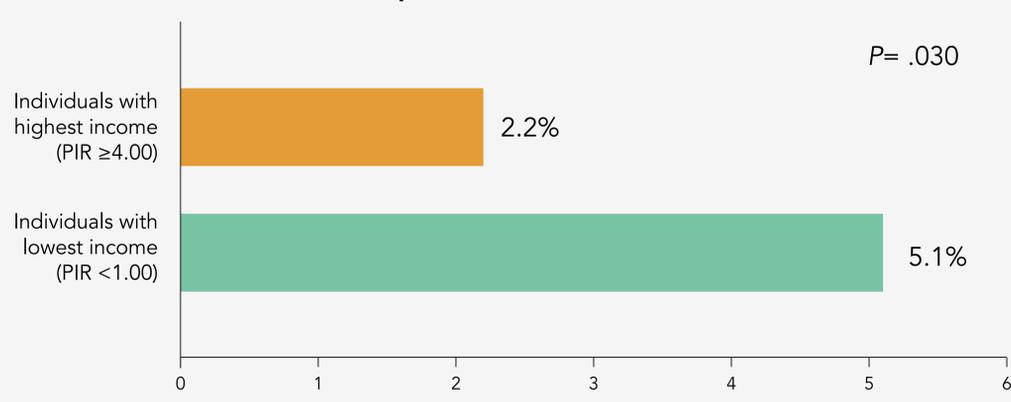
In both NHANES III and NHANES 2005-2008:

- The age- and sex-standardized prevalence of DR was significantly higher among those with less than a high school education than among those with more than a high school education.
- No significant difference by educational attainment was observed in the prevalence of AMD, glaucoma, or cataract surgery for either time.

Differences by income level were observed in the prevalence of certain eye diseases

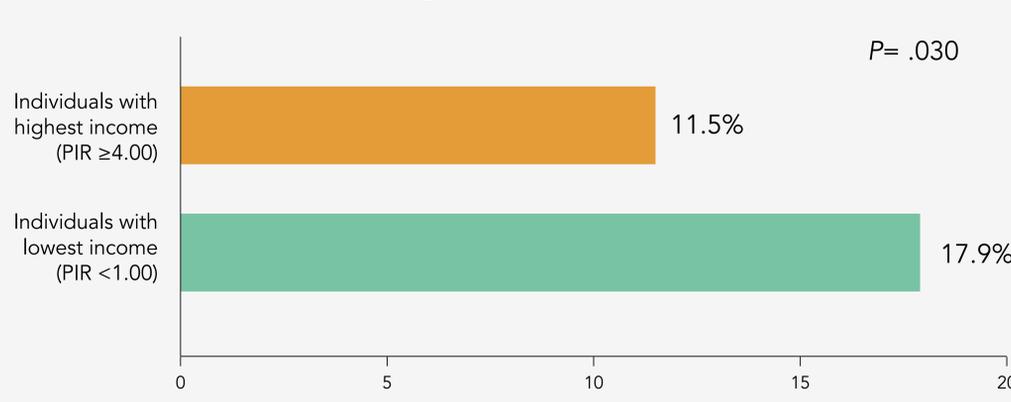
Although no significant differences for income were observed in NHANES III, the age- and sex-standardized prevalence of DR in NHANES 2005-2008 was significantly higher among individuals at the lowest income level (PIR <1.00) compared to those at the highest income levels (PIR ≥ 4.00).

Standardized prevalence of DR in NHANES 2005-2008



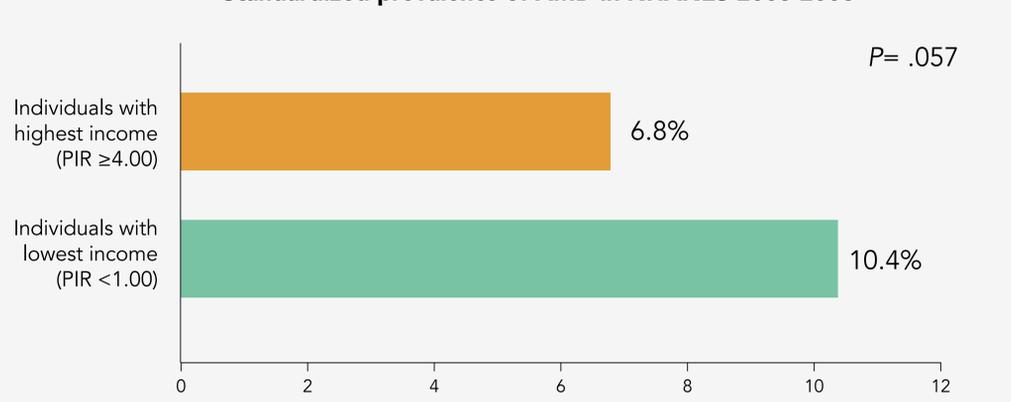
The age and sex-standardized prevalence of AMD in NHANES III was higher among those at the lowest income level than those at the highest income levels.

Standardized prevalence of AMD in NHANES III



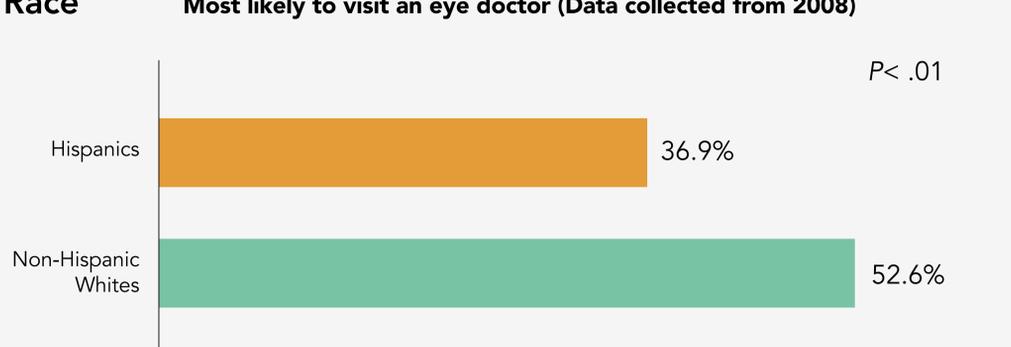
The age and sex-standardized prevalence of AMD in NHANES 2005-2008 was higher among those at the lowest income level than those at the highest income levels although the difference was not statistically significant.

Standardized prevalence of AMD in NHANES 2005-2008



Variations in level of eye care utilization were observed across differing race/ethnicities, educational and income levels

Race Most likely to visit an eye doctor (Data collected from 2008)



Education

From 1999 to 2008, individuals with less than a high school education were consistently less likely to have had an eye care visit in the previous 12 months than those with more than a high school education (all $P < .01$).

Income level

Individuals income level with PIR <1.00 were consistently less likely to have an eye care visit than those with PIR ≥ 4.0 (all $P < .05$).

There are implications to public health

One of the core elements of a coordinated public health approach to improve the nation's vision health is implementing a national vision health surveillance and evaluation system. A national surveillance system assesses and monitors long-term outcomes of improved prevention and control of eye diseases and vision loss, increases access to eye care, improves quality of life for the visually impaired, and enhances vision health promotion throughout all life stages for all Americans.



The underlying reasons for the identified disparities need to be identified first. Whenever possible, the efficacy, cost-effectiveness, and appropriate methodologies of screening should be established and implemented among the subpopulations most in need.

Challenges remain for getting those at risk screened and seen by a healthcare professional.

An integrated surveillance system could identify and monitor the process of translating such public health interventions for communities to reduce existing visual health disparities.

Disparities by race/ethnicity, education, and economic status show that the greatest need is for innovative interventions to reduce unnecessary vision loss among socioeconomically disadvantaged groups.

Conclusions

DR prevalence was higher among the less educated and the impoverished, which underscores a critical need for services, particularly regular eye examinations. Affordability, continuity, and regular sources of care, as well as physician advice, have been shown to be strongly associated with receipt of needed eye care services.

Individuals with less education and lower income were both less likely to visit an eye doctor within the past year and less able to afford eyeglasses when needed. A previous study similarly found that those with more education are more likely to see an eye care professional compared to those less educated. Additionally, more than 50% of Medicare beneficiaries have not visited an eye care provider or received an annual eye examination. Lack of awareness about vision health is a major problem, especially among low-income, minority, and uninsured families who are at the highest risk for not accessing vision screening programs.

Observed vision health disparities suggest a need for educational and innovative interventions among socioeconomically disadvantaged groups.