

INVESTMENT IN RESEARCH SAVES LIVES AND MONEY

Vision Loss and Blindness

Vision loss and blindness can have far-reaching effects on a person's life. Some common eye diseases include diabetic retinopathy (DR), age-related macular degeneration (AMD), glaucoma, and cataracts.¹ Advances in research have yielded new technologies and therapies to help improve sight and quality of life for those dealing with vision loss and blindness.

TODAY
Vision disability is one of the **top 10 disabilities** among adults 18 years and older.²

About **26.9 million** adult Americans have difficulty seeing, even when wearing contacts or glasses, or complete vision loss.³

The number of people with blindness in the U.S. is expected to **double** by 2050 to roughly **8 million**.⁴

Research Delivers Solutions

Dry age-related macular degeneration (AMD) is the most common cause of vision loss in people over 50.⁹ When certain cells in the eye, known as RPE cells, aren't working properly, the cells in the retina that respond to light (called photoreceptors) die, leading to vision loss. A 2019 study explored a potential AMD therapy using a type of stem cells called induced pluripotent stem cells. This preclinical study found that inserting a "patch" of healthy RPE cells grown from stem cells into the eye may help keep the photoreceptors healthy.¹⁰ Further testing is needed, but this patch may soon provide a solution for those living with AMD.

Wet AMD is the less common type of AMD. With wet AMD, abnormal blood vessels beneath the retina leak blood and fluid into the eye, damaging the retina and causing vision loss. Optical coherence tomography (OCT), an imaging technique developed by the NIH and the National Science Foundation (NSF), is used frequently for the diagnosis and management of wet AMD. A 2018 study found the use of OCT to guide personalized anti-VEGF treatment, a drug treatment that produces new blood vessels, has accrued an estimated savings of \$2.2 billion for AMD patients.¹¹

Cataracts, which are a clouding of the eyes' lenses, can develop as a person ages or after injuring the eye, impairing individuals' ability to do everyday tasks. Thanks to research and improvements in medical technology, synthetic intraocular lenses, which replace lenses clouded with cataracts, can be implanted in patients and grant improved sight.¹²

Glaucoma is a group of eye conditions that damage the optic nerve; glaucoma is often caused by abnormally high pressure in the eye.¹³ Two new medications for glaucoma, Vyzulta and Rhopress – the first in 18 years – were approved in 2018 after decades of research supported by the National Eye Institute (NEI) within the National Institutes of Health (NIH). These medications treat the tissue in the eye responsible for the increased pressure.¹⁴

COST

In the U.S., the annual economic impact of major vision problems among adults is more than **\$170 billion**.⁵

The annual medical costs for a person with blindness and low vision range from almost **\$1,500 to more than \$10,000**, with costs increasing with age.⁶

In 2015, **37%** of blind or visually impaired individuals worked full time, versus the national annual rate of 59.4%.^{7 8}

Common Eye Disorders

Age-related macular degeneration

(AMD): Eye disorder associated with aging. AMD results in damaged sharp and central vision needed to perform daily tasks such as reading and driving. There are two forms of AMD — wet and dry.

Cataracts: Clouding of the eye's lens. Cataracts can occur at any age because of a variety of causes, and can be present at birth.

Diabetic retinopathy (DR): A common complication of diabetes. DR is characterized by progressive damage to the blood vessels of the retina, the light-sensitive tissue at the back of the eye that is needed for vision.

Glaucoma: A group of eye conditions that damage the optic nerve often caused by an abnormally high pressure in the eye. Glaucoma can result in vision loss and blindness.

Vision Loss and Blindness

Then. Now. Imagine.

THEN

Before 1905, diseases of the cornea on the front surface of the eye resulted in incurable blindness.¹⁶

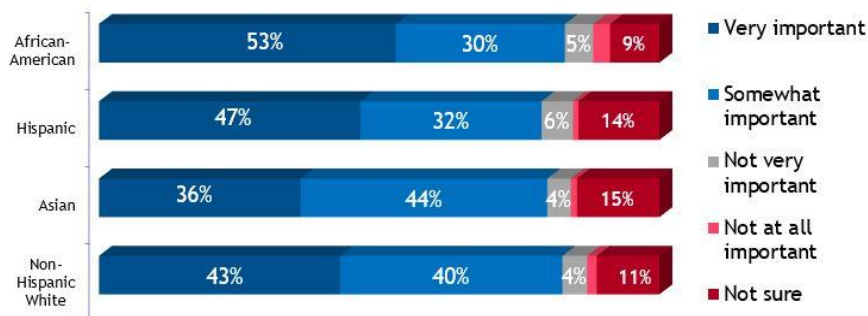
NOW

Corneal blindness can now be cured with corneal transplants with a success rate of over 90%.¹⁷

IMAGINE

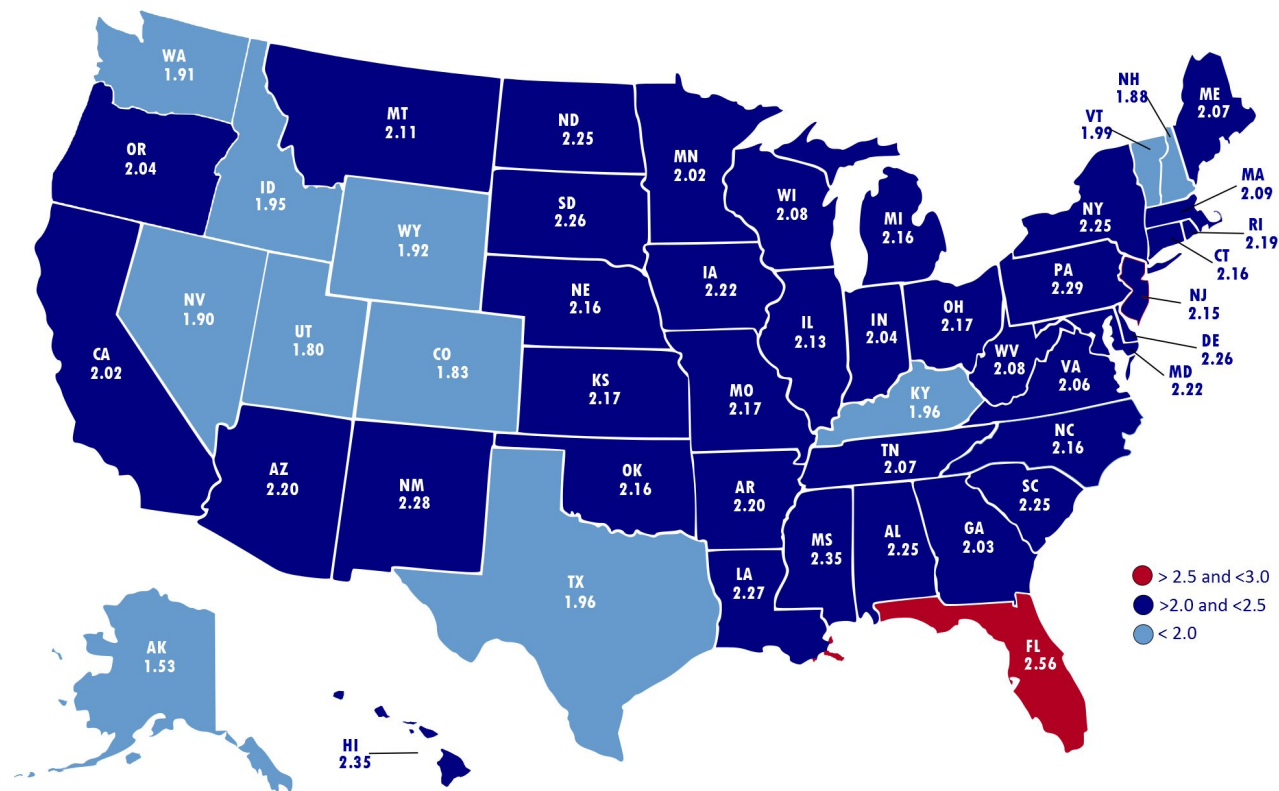
A cure for all vision loss.

How important is it that our nation supports research that focuses on improving prevention and treatment of eye and vision disorders?



Source: A Research!America poll of U.S. adults conducted in partnership with Zogby Analytics and the Alliance For Eye and Vision Research (AEVR) through a grant from Research to Prevent Blindness, August 2014.

Prevalence of Visual Impairment in the U.S. (Cases per 100 people aged 40 years and older, 2015)¹⁸



● > 2.5 and <3.0
 ● >2.0 and <2.5
 ● < 2.0

1. "Vision Health Basics". CDC. 2019
2. "Statistics." American Foundation for the Blind. 2019.
3. "Fast Facts". CDC. 2019.
4. "Visual impairment, blindness cases in U.S. expected to double by 2050". NIH. 2016.
5. "The Future of Vision: Forecasting the Prevalence And Costs of Vision Problems". Prevent Blindness. 2014.
6. "The Preventable Burden of Untreated Eye Disorders". The National Academies of Sciences, Engineering, and Medicine. 2016.
7. "The Employment Situation". Bureau of Labor Statistics. 2016.
8. Bell and Mino. "Employment Outcomes for Blind and Visually Impaired Adults." Journal of Vision and Blindness. 2015.
9. "NEI support paved early pathway for novel glaucoma therapies." National Eye Institute-NIH. 2018. 12.
10. "Macular Degeneration". Johns Hopkins: Wilmer Eye Institute. 2019.
11. Sharma et al., "Clinical-grade stem cell-derived retinal pigment epithelium patch rescues retinal degeneration in rodents and pigs". Sci Transl Med. 2019.
12. Windsor et al. "Estimating Public and Patient Savings From Basic Research—A Study of Optical Coherence Tomography in Managing Antiangiogenic Therapy". AJO. 2018.
13. Davis. "The Evolution of Cataract Surgery". Mo Med. 2016.
14. "Glaucoma". Mayo Clinic. 2019.
15. "NEI support paved early pathway for novel glaucoma therapies." National Eye Institute-NIH. 2018.
16. "Common Eye Disorders". CDC. 2019.
17. Crawford, Patel, and McGhee. "A brief history of corneal transplantation: From ancient to modern". 2013.
18. Varma et al. "Visual Impairment and Blindness in Adults in the United States: Demographic and Geographic Variations From 2015 to 2050". JAMA Ophthalmol. 2016.

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