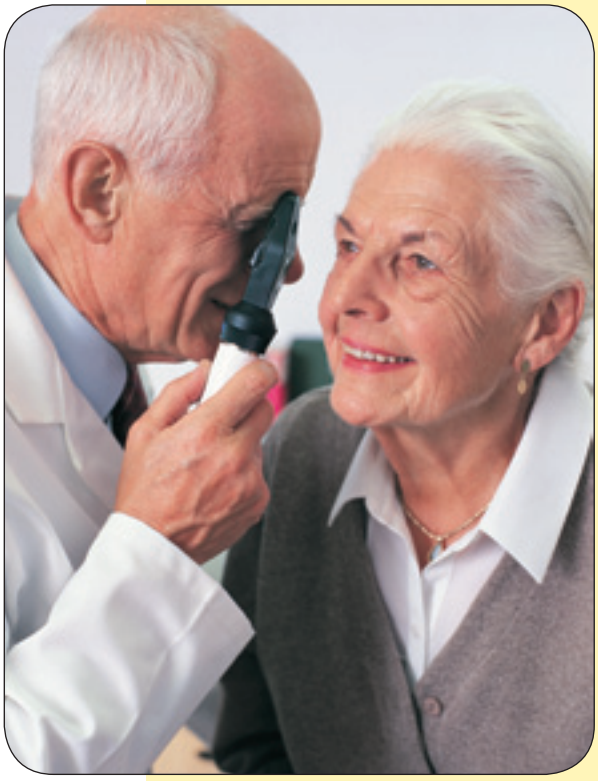
The State of Vision, Aging, and Public Health in America

Vision impairment is a serious public health concern among older adults, affecting more than 2.9 million people in the United States.[1–3] This issue brief summarizes the prevalence of vision loss and eye diseases reported by people aged 65 or older, and it provides information about access to eye care, health status, and comorbid conditions among older adults. Data were collected from 19 states that used the Vision Impairment and Access to Eye Care Module (Vision Module) of CDC's Behavioral Risk Factor Surveillance System (BRFSS) during 2006–2008.

Vision Impairment and the Health of Older Adults



The prevalence of blindness and vision impairment increases rapidly with age among all racial and ethnic groups, particularly among people older than 75 years.[4] Cases of early age-related macular degeneration are expected to double by 2050, from 9.1 million to 17.8 million for those aged 50 years or older.[5] Cases of diabetic retinopathy among people aged 65 or older are expected to quadruple by 2050, from 2.5 million to 9.9 million.[6]

National studies indicate that vision loss is associated with higher prevalence of chronic health conditions,[7] death,[8] falls and injuries,[9] depression, and social isolation.[10,11] When combined with chronic health conditions such as diabetes, vision loss is associated with overall poorer health among people aged 65 or older.[7] Vision loss compromises people's quality of life because it reduces their capacity to read, drive a car, watch television, or keep personal accounts. Often, it isolates older people and keeps them from friends and family.

Direct medical expenses for older adults with vision impairment cost the United States $8.3 billion a year.[12]

Healthy People 2020 Adult Vision Objectives

- Increase the proportion of adults who have a comprehensive eye examination, including dilation, within the past 2 years or by age 45.
- Reduce visual impairments caused by
  - Uncorrected refractive error.
  - Diabetic retinopathy.
  - Glaucoma.
  - Cataract.
  - Age-related macular degeneration (AMD).
- Reduce occupational eye injuries.
  - Reduce occupational eye injuries resulting in lost work days.
  - Reduce occupational eye injuries treated in emergency departments.
- Increase the use of personal protective eyewear in recreational activities and hazardous situations around the home.
- Increase vision rehabilitation.
  - Increase the use of vision rehabilitation services by people with visual impairments.
  - Increase the use of assistive and adaptive devices by people with visual impairments.

Vision Loss and Public Health

Healthy People 2010 and *Healthy People 2020* call for improving the vision health of the U.S. population through prevention, early detection, treatment, and rehabilitation.[13] Public health research brings a distinct perspective to vision health and vision loss. Officials and researchers working in public health seek to better understand the magnitude and dimensions of vision loss at national, state, and community levels.

By collecting data on vision and health, researchers can identify specific health disparities among different populations and in different parts of the country. This information can be used to tailor health promotion interventions to state and local needs.

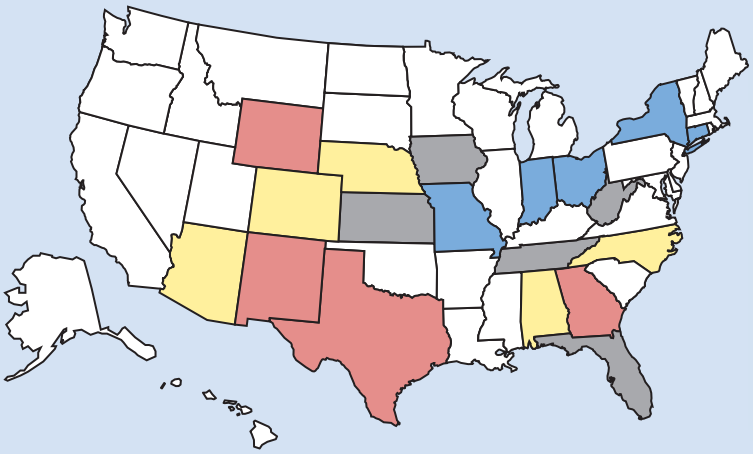
Research has shown that recommended eye care that addresses eye diseases and refractive error may remediate 50% of vision problems.[14] However, many older adults do not seek regular eye care. Improving access to eye care, especially for those most at risk for vision loss, is an important way to improve vision health in the United States—and it should be a priority for the public health community.

Because smoking, high blood pressure, diabetes, and injury can contribute to vision loss, public health initiatives should promote community and state collaborations as a way to integrate vision health into community health promotion activities. For people with severe vision loss, much can be done to promote health and quality of life through better nutrition, increased physical activity, and positive lifestyle choices.

Vision Health Data

In this issue brief, we present specific questions from the BRFSS Vision Module, as well as key findings from the resulting data. All findings are for U.S. adults aged 65 years or older who fall into one of three groups:

- Those reporting *no difficulty* recognizing a friend across the street or reading print (no vision loss).
- Those reporting *a little difficulty* with distance or near tasks (little vision loss).
- Those reporting *moderate or extreme vision loss* with distance and near tasks or unable to do tasks because of eyesight.



Visual Function

Percentage of U.S. adults aged 65 years or older who reported moderate or extreme vision loss, by state, BRFSS, 2006–2008

- 5.4%–11.0%
- 11.1%–12.8%
- 12.9%–14.5%
- 14.6%–16.0%
- Did not implement Vision Module

Key BRFSS Findings

- The prevalence of moderate or extreme vision loss ranged from 5.4% in Tennessee to 16% in Georgia.
- By race/ethnicity, 16.2% of older non-Hispanic black adults and 16.1% of older Hispanic adults reported moderate or extreme vision loss, compared with 11.4% of non-Hispanic white adults.
- By education level, moderate or extreme vision loss was reported by
  - 16.8% of older adults without a high school education.
  - 12.5% of older adults with a high school education.
  - 10.5% of older adults with more than a high school education.
- Older adults with moderate or extreme vision loss were
  - More likely to report diabetes, heart disease, and stroke than those without vision loss.
  - Less likely to report excellent or very good health and more likely to report fair or poor health than those without vision loss.
- Across the 19 states, the prevalence of eye diseases ranged from
  - 25.3% to 33.7% for cataracts.
  - 6.8% to 12.3% for glaucoma.
  - 6.8% to 11% for macular degeneration.
  - 1.6% to 5% for diabetic retinopathy.

See page 15 for a summary of state-level, self-reported moderate or extreme vision loss rates by sex and race/ethnicity among U.S. adults aged 65 years or older.

BRFSS Questions

The BRFSS asks two questions about visual function:

1. How much difficulty, if any, do you have in recognizing a friend across the street?
2. How much difficulty, if any, do you have reading print in newspapers, magazines, recipes, menus, or numbers on the telephone?

Possible responses include the following:

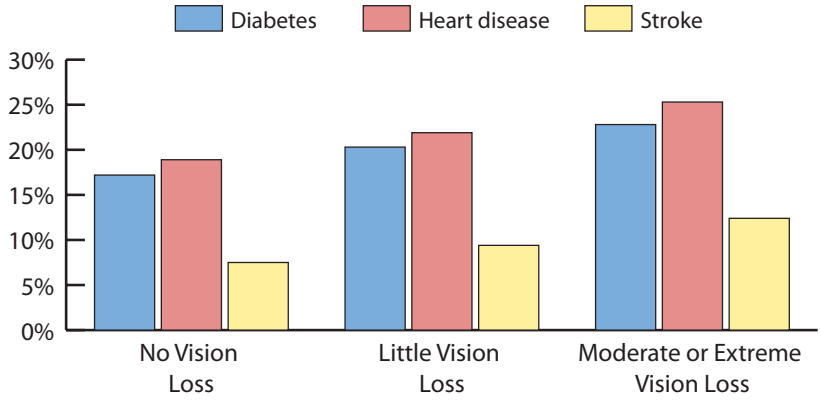
- ☐ No difficulty.
- ☐ A little difficulty.
- ☐ Moderate difficulty.
- ☐ Extreme difficulty.

Among older adults without vision loss, 70.2% reported that they engaged in physical activity. Only 59.6% of those with moderate or extreme vision loss engaged in physical activity.

Chronic Health Conditions

Older adults with moderate or extreme vision loss reported higher prevalence of diabetes, heart disease, and stroke than those without vision loss.

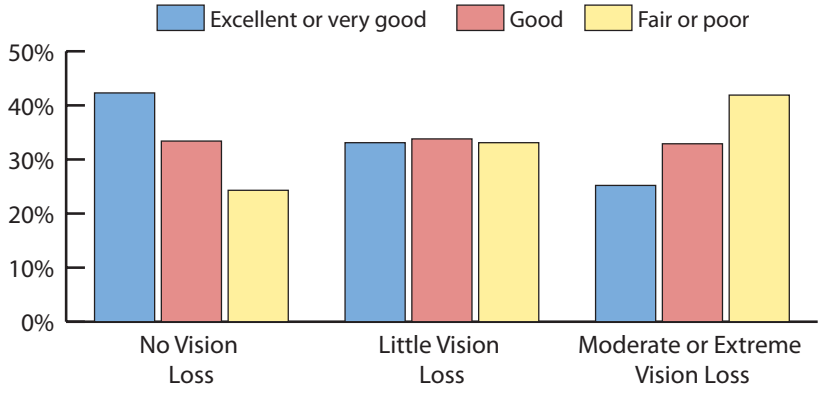
Chronic Health Conditions Among Older Adults With and Without Vision Loss, BRFSS, 2006–2008

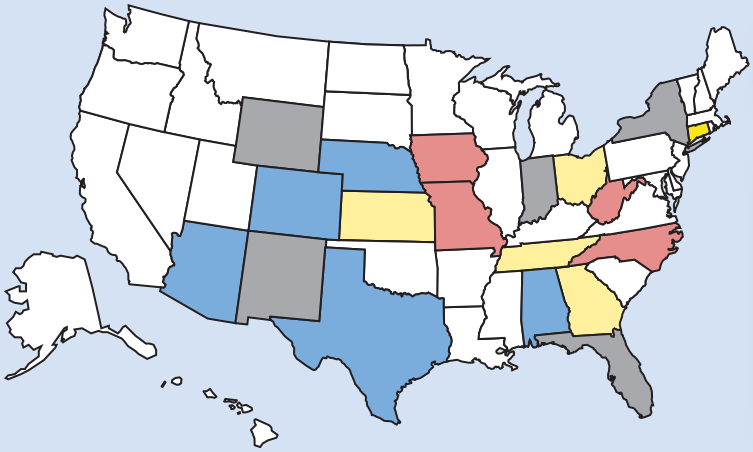


Health Status

Older adults with moderate or extreme vision loss were less likely to report excellent or very good health than those without vision loss. They also were more likely to report fair or poor health.

Self-Reported Health Status Among Older Adults With and Without Vision Loss, BRFSS, 2006–2008





Eye Diseases

Percentage of U.S. adults aged 65 years or older who reported having a cataract, by state, BRFSS, 2006–2008

- 25.3%–28.4%
- 29.5%–31.1%
- 28.5%–29.4%
- 31.2%–33.7%
- Did not implement Vision Module

Cataracts

A cataract is a clouding of the eye's lens. Cataracts can occur at any age with a variety of causes, and they can occur at birth. Treatment for the removal of cataracts is widely available.

Data from the BRFSS Vision Module show that

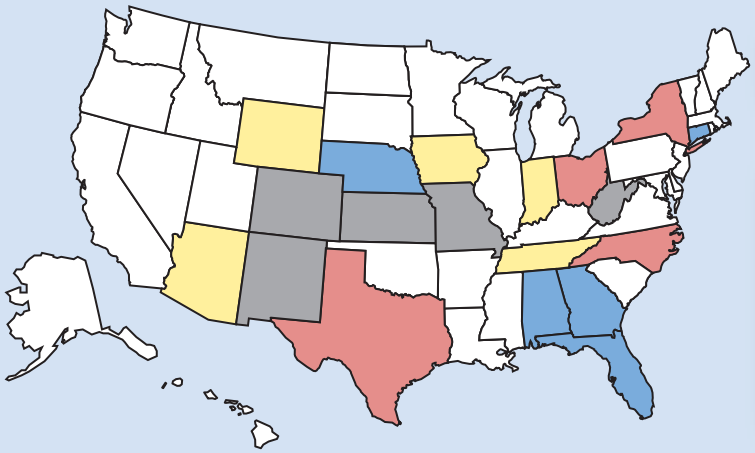
- Self-reported cataracts ranged from 25.3% in New Mexico to 33.7% in Iowa. The average prevalence for all 19 states was 29.2%.
- When analyzed by sex, 26.4% of men and 31.1% of women reported they *now have* cataracts; 22.7% of men and 30.8% of women reported that they had cataracts removed.
- Among those aged 85 years or older, 54% reported that they had cataracts removed.

Data from other sources indicate that more than 15 million Americans aged 65 years or older have a cataract in one or both eyes. By 2020, the estimated number of people aged 40 or older with cataracts is expected to rise to more than 30 million.[15]

BRFSS Question

Have you been told by an eye doctor or other health care professional that you NOW have cataracts?

- ☐ Yes.
- ☐ Yes, but had them removed.
- ☐ No.



Eye Diseases

Percentage of U.S. adults aged 65 years or older who reported glaucoma, by state, BRFSS, 2006–2008

- 6.8%–8.4%
- 9.5%–10.2%
- 8.5%–9.4%
- 10.3%–12.3%
- Did not implement Vision Module

BRFSS Question

Have you EVER been told by an eye doctor or other health care professional that you had glaucoma?

- ☐ Yes.
- ☐ No.

Glaucoma

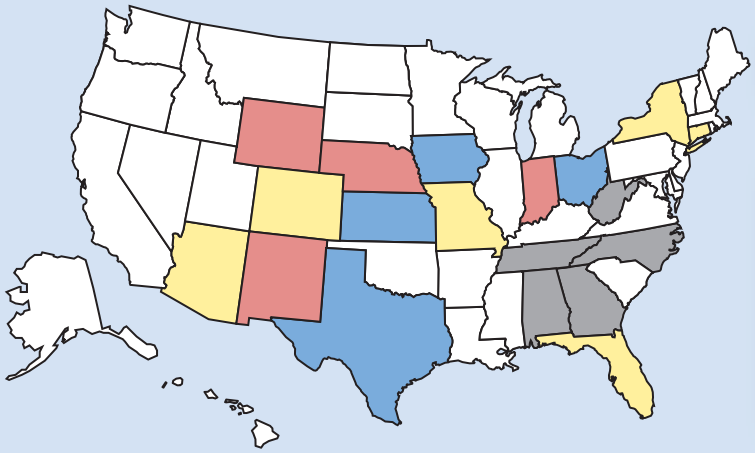
Glaucoma is a group of diseases that can damage the eye's optic nerve and result in vision loss and blindness. Glaucoma occurs when the normal fluid pressure inside the eyes slowly rises. However, recent findings now show that glaucoma can occur with normal eye pressure. With early treatment, eyes can be protected against serious vision loss.

There are two categories of glaucoma: open angle and closed angle. Open angle glaucoma is a chronic condition that progresses slowly without the person noticing vision loss until the disease is very advanced. Because of this slow progression, it is called the "sneak thief of sight." Closed angle glaucoma can appear suddenly and is painful. Visual loss can progress quickly, but the pain and discomfort typically lead patients to seek medical attention before permanent damage occurs.

Data from the BRFSS Vision Module show that

- Glaucoma ranged from 6.8% in New Mexico to 12.3% in Texas.
- 9% of men and 10% of women reported that they had glaucoma.
- 6% of older adults aged 65–69 years reported they had glaucoma. The percentage increased with age and was 17% among those aged 85 years or older.

According to Prevent Blindness America and the National Eye Institute, glaucoma is more prevalent among blacks than among other U.S. racial and ethnic groups.[4] In addition, the number of glaucoma cases among Hispanics aged 65 years or older who have diabetes is expected to increase 12-fold by 2050.[6]



Percentage of U.S. adults aged 65 years or older who reported age-related macular degeneration, by state, BRFSS, 2006–2008

- 6.8%–8.1%
- 8.2%–9.8%
- 9.9%–10.5%
- 10.6%–11.5%
- Did not implement Vision Module

Age-Related Macular Degeneration

Age-related macular degeneration (AMD) affects the macula, the central part of the retina that allows the eye to see fine detail (e.g., during reading and driving). There are two forms: wet and dry. Wet AMD occurs when abnormal blood vessels behind the retina grow under the macula, ultimately leading to blood and fluid leakage. Bleeding, leaking, and scarring from these blood vessels cause damage and lead to rapid central vision loss.

In dry AMD, the macula thins over time as part of aging, gradually blurring central vision. The dry form accounts for 85%–90% of AMD cases.

Data from the BRFSS Vision Module show that

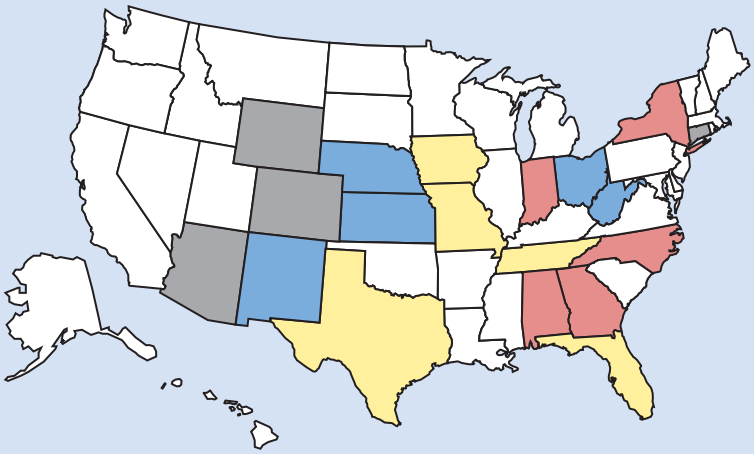
- AMD ranged from 6.8% in Tennessee to 11.5% in Wyoming among people aged 65 years and older.
- AMD increases rapidly among older age groups: from 4% among those aged 65–69 years to 22% among those aged 85 years or older.
- 9% of men and 10% of women reported AMD.

Other data sources show that AMD is more likely to affect whites than members of other racial and ethnic groups. AMD is the leading cause of blindness in older adults today, accounting for 54% of all blindness among white Americans.[5] Cases of early AMD are expected to double by 2050, increasing to 17.8 million.[5]

BRFSS Question

Have you EVER been told by an eye doctor or other health care professional that you had age-related macular degeneration?

- ☐ Yes.
- ☐ No.



Percentage of U.S. adults aged 65 years or older who reported diabetic retinopathy, by state, BRFSS, 2006–2008

- 1.6%–2.9%
- 3.5%–3.9%
- 3.0%–3.4%
- 4.0%–5.0%
- Did not implement Vision Module

Diabetic Retinopathy

Diabetic retinopathy is a common complication of diabetes that usually affects both eyes. It is characterized by progressive damage to the blood vessels of the retina, the light-sensitive tissue at the back of the eye that is necessary for good vision.

Data from the BRFSS Vision Module show that

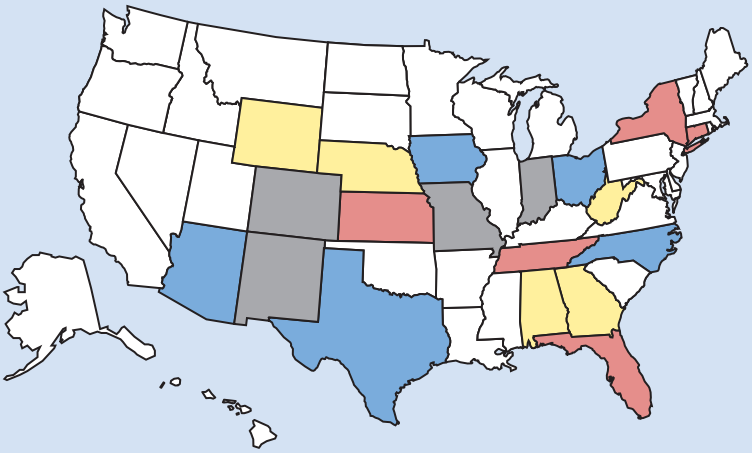
- Diabetic retinopathy ranged from 1.6% in Connecticut to 5% in Georgia.
- 4% of men and 3% of women reported that they had diabetic retinopathy.

Among people aged 65 years or older in the United States, diabetic retinopathy is expected to increase from 2.5 million in 2005 to 9.9 million by 2050.[6] According to national data, black and Hispanic people with diabetes are more likely than whites to develop diabetic retinopathy.[17] A recent national study indicated that diabetic retinopathy among Hispanics aged 65 years or older is expected to increase 9-fold by 2050.[6]

BRFSS Question

Has a doctor EVER told you that diabetes has affected your eyes or that you had retinopathy?

- ☐ Yes.
- ☐ No.



Access to Eye Care

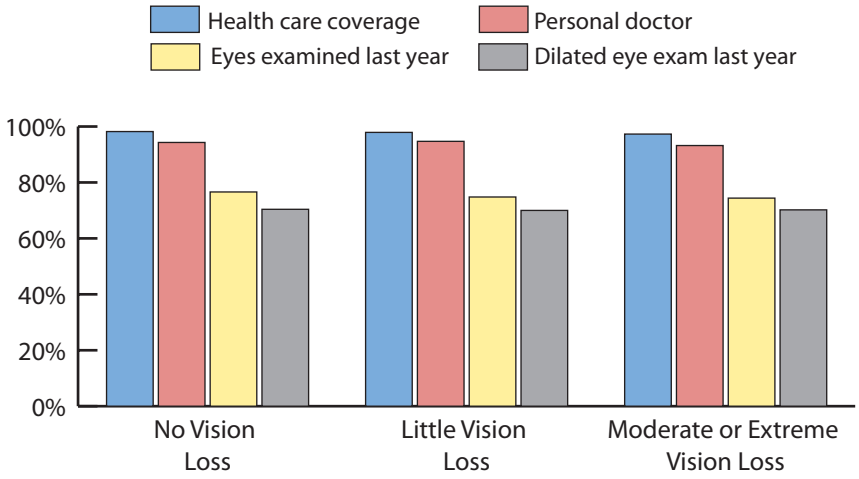
Percentage of U.S. adults aged 65 years or older who reported having an eye examination within the last year, by state, BRFSS, 2006–2008

- 69.5%–71.4%
- 71.5%–73.7%
- 73.8%–76.8%
- 76.9%–80.5%
- Did not implement Vision Module

Access to Eye Care Findings

- The percentage of older adults who reported having an eye examination within the past year ranged from 69.5% in Missouri to 80.5% in Florida.
- The percentage of older adults who reported having a dilated eye examination within the last year ranged from 62.8% in Missouri to 77.1% in Florida.
- Older adults who report moderate or extreme vision loss are no more likely than those with no vision loss to get eye examinations.

Percentage of Older Adults With and Without Vision Loss Who Report Having Access to Health Care and Eye Health Care, BRFSS, 2006–2008



BRFSS Questions

The BRFSS asks the following questions about access to eye care:

1. When was the last time you had your eyes examined by any doctor or eye care provider?
2. When was the last time you had an eye exam in which the pupils were dilated?

Possible responses include the following:

- ☐ Within the past month (anytime less than 1 month ago).
- ☐ Within the past year (1 month but less than 12 months ago).
- ☐ Within the past 2 years (1 year but less than 2 years ago).
- ☐ 2 or more years ago.
- ☐ Never.

BRFSS Question

What is the main reason you have not visited an eye care professional in the past 12 months?

- ☐ Cost/insurance.
- ☐ Do not have/know an eye doctor.
- ☐ Cannot get to the office/ clinic (too far away, no transportation).
- ☐ Could not get an appointment.
- ☐ No reason to go (no problem).
- ☐ Have not thought of it.
- ☐ Other.

Reasons for Not Seeking Eye Care

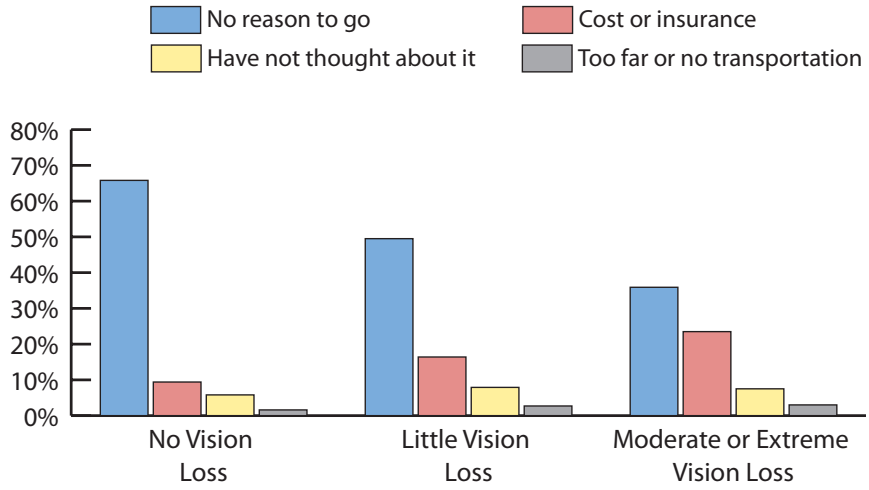
Among older adults who reported moderate or extreme vision loss,

- More than one-third (35.9%) said their main reason for not seeing an eye care provider in the last 12 months was that they had no reason to go.
- Nearly one-quarter (23.5%) said that cost or insurance concerns prevented them from seeking eye care.
- Another 7.5% said they had not thought about it.

Medicare pays for glaucoma screening, cataract removal, and treatment of macular degeneration in some cases. It does not pay for routine eye examinations or glasses.

These findings suggest that older adults, even those with substantial vision loss, may need to be educated about the importance of vision health and routine eye examinations. Primary care physicians also may need to be educated about the importance of referring patients to eye care specialists who can detect and treat eye diseases and conditions that affect vision.

Reasons for Not Visiting an Eye Care Professional Among Older Adults With and Without Vision Loss, BRFSS, 2006–2008



Technical Notes

Behavioral Risk Factor Surveillance System

BRFSS

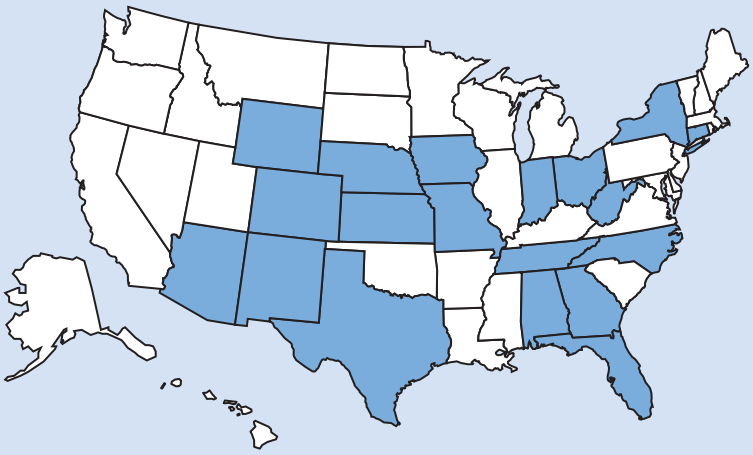
Since 1984, the BRFSS has helped states survey civilian, non-institutionalized U.S. adults aged 18 years or older about a wide range of health risk behaviors, preventive health practices, and health care access. In 2008, about 350,000 people were surveyed through this state-based telephone surveillance system. The BRFSS provides data to help state and national public health agencies monitor population health, as well as identify trends and emerging health concerns.

The BRFSS includes the following components:

- Core questions asked in all 50 states, the District of Columbia, and 3 U.S. territories.
- Supplemental modules that ask questions about specific topics, such as vision.
- Additional questions added by individual states.

The core survey gathers demographic information (such as age, race, and education level), as well as information about self-reported mental and physical health, life satisfaction, and specific health conditions and behaviors (such as diabetes, tobacco use, and exercise). In addition, the 2008 BRFSS contained 23 modules that asked in-depth questions about various health concerns, including vision.

The BRFSS is the world's largest random-digit-dialed telephone survey, and its data are considered to be reliable and valid.[18] Despite its breadth, BRFSS data do have some limitations. The survey excludes people who do not have a landline or who live in institutional settings. It may exclude people who have substantial hearing loss and do not use a conventional telephone. In addition, it may exclude people with impairments so severe that it is difficult to get to the telephone or participate in the interview. The BRFSS survey relies on self-reported answers, and responses are not confirmed. Self-reported eye diseases are not confirmed by clinical examinations.



BRFSS Vision Module

States that implemented the BRFSS Vision Module, 2006–2008

Yes

No

BRFSS Vision Module

The BRFSS Vision Module was developed by CDC's Vision Health Initiative and first implemented in 2005. CDC provides financial support to states that implement the module, and 19 states have begun using it since 2005.

The Vision Module contains nine questions about visual function, eye diseases, frequency of eye examinations, and reasons for not seeking eye care. Two of the nine questions are about function (distance and near vision), four are about access to eye examinations (related to dilated eye examinations, reasons for not visiting an eye care professional, and vision insurance), and three are about specific eye diseases (cataracts, glaucoma, and age-related macular degeneration). Information about diabetic retinopathy is taken from the BRFSS's diabetes module.

The BRFSS Vision Module surveys adults aged 40 years or older. In this issue brief, we report data for those aged 65 or older from the 19 states that implemented the module during 2006–2008. These states are Alabama, Arizona, Colorado, Connecticut, Florida, Georgia, Indiana, Iowa, Kansas, Missouri, Nebraska, New Mexico, New York, North Carolina, Ohio, Tennessee, Texas, West Virginia, and Wyoming.

How BRFSS Data Promote Public Health

Data collected by the BRFSS Vision Module can be used to promote public health in several ways. These data can be used to identify and address health conditions among people aged 40 years or older who have vision problems; to determine the level of access to eye care among members of this population; and to provide other evidence that can be used to improve the effectiveness, accessibility, and quality of eye care.

These data also enhance public health surveillance and guide programs and policies in important ways. For example,

- Reliable and timely surveillance allows for accurate state and national estimates of eye diseases, vision loss, and access to eye care.
- Accurate data allow states to identify health disparities among different population groups, focus on populations at risk, and tailor interventions to educate and empower people with vision loss.
- Accurate state data guide collaborations within and among states, as well as with federal agencies such as CDC, to improve vision health for all older adults and quality of life for those with vision loss.

The BRFSS is a powerful surveillance tool that provides extensive information on the prevalence of health conditions and behaviors among U.S. adults. The BRFSS is administered and supported by CDC's Office of Surveillance, Epidemiology, and Laboratory Services.

For more information, visit http://www.cdc.gov/brfss.

Suggested Citation: Centers for Disease Control and Prevention. *The State of Vision, Aging, and Public Health in America*. Atlanta: U.S. Department of Health and Human Services; 2011.

References

1. Saaddine JB, Venkat Narayn KM, Vinicor F. Vision loss: a public health problem? *Ophthalmology* 2003;10(2):253–254.
2. Crews JE. The role of public health in addressing aging and sensory loss. *Generations* 2003;27(10): 83–90.
3. Congdon N, O'Colmain B, Klaver CCW, Klein R, Munoz B, Friedman DS, et al. Causes and prevalence of visual impairment among adults in the United States. *Archives of Ophthalmology* 2004;113:477–485.
4. Prevent Blindness America, National Eye Institute. *The Vision Problems in the U.S.: Prevalence of Adult Vision Impairment and Age-Related Eye Disease in America*. Bethesda, MD: National Institutes of Health; 2008.
5. Rein DB, Wittenborn JS, Zhang X, Honeycutt AA, Lesesne SB, Saaddine J. Forecasting age-related macular degeneration through the year 2050: the potential impact of new treatments. *Archives of Ophthalmology* 2009;127(4):533–540.
6. Saaddine JB, Honeycutt AA, Narayan KM, Zhang X, Klein R, Boyle JP. Projection of diabetic retinopathy and other major eye diseases among people with diabetes mellitus: United States, 2005–2050. *Archives of Ophthalmology* 2008;126(12):1740–1747.
7. Crews JE, Jones GC, Kim JH. Double jeopardy: the effects of comorbid conditions among older people with vision loss. *Journal of Visual Impairment and Blindness* 2006;100:824–848.
8. Lee DJ, Gomez-Marin O, Lam BL, Zheng DD. Visual acuity impairment and mortality in US adults. *Archives of Ophthalmology* 2002;120:1544–1550.
9. Ivers RQ, Norton R, Cumming RG, Butler M, Campbell AJ. Visual impairment and risk of hip fracture. *American Journal of Epidemiology* 2000;152(70):633–639.
10. Jones GC, Rovner BW, Crews JE, Danielson ML. Effects of depressive symptoms on health behavior practices among older adults with vision loss. *Rehabilitation Psychology* 2009;54(2):164–172.
11. Horowitz A. Depression and vision and hearing impairments in later life. *Generations* 2003;27(1): 32–38.
12. Rein DB, Zhang P, Wirth KE, Lee PP, Hoerger TJ, McCall N, et al. The economic burden of major adult visual disorders in the United States. *Archives of Ophthalmology* 2006;124:1754–1760.
13. U.S. Department of Health and Human Services. *Healthy People 2020.* Available at http://www.healthypeople.gov.
14. Sommer A, Tielsch JM, Katz J, Quigley HA, Gottsch JD, Javitt JC, et al. Racial differences in cause specific prevalence of blindness in East Baltimore. *New England Journal of Medicine* 1991;325(2): 1412–1417.
15. Congdon N, Vingerling JR, Klein BEK, West S, Friedman DS, Kempton J, et al. Prevalence of cataract and pseudophakia/aphakia among adults in the United States. *Archives of Ophthalmology* 2004;122:487–494.
16. Harris MI, Klein R, Cowie CC, Rowland M, Byrd-Holt DD. Is the risk of diabetic retinopathy greater in non-Hispanic blacks and Mexican Americans than in non-Hispanic whites with type 2 diabetes? A U.S. population study. *Diabetes Care* 1998;21(8):1230–1235.
17. Harris EL, Sherman SH, Georgopoulos A. Black-white differences in risk of developing retinopathy among individuals with type 2 diabetes. *Diabetes Care* 1999;22(5):779–783.
18. Nelson D, Holtzman D, Bolen J, Stanwyck CA, Mack KA. Reliability and validity of measures for the Behavioral Risk Factor Surveillance System (BRFSS). *International Journal of Public Health* 2001;46(Suppl 1):S3–S42.

Rates of Self-Reported Moderate or Extreme Vision Loss, by Sex and Race/Ethnicity Among U.S. Adults Aged 65 Years or Older, by State

	Men		Women		Non-Hispanic White		Non-White*		Total	
State	Rate (%)	(95% CI)†	Rate (%)	(95% CI)	Rate (%)	(95% CI)	Rate (%)	(95% CI)	Rate (%)	(95% CI)
Alabama	9.7	(7.9, 12.0)	12.1	(10.6, 13.7)	10.6	(9.3, 12.1)	11.9	(9.3, 15.1)	11.1	(9.9, 12.4)
Arizona	11.0	(7.4, 16.1)	11.9	(8.5, 16.6)	10.7	(8.1, 14.0)	N/A	N/A	11.5	(8.9, 14.8)
Colorado	N/A‡	N/A	14.5	(12.2, 17.2)	11.4	(9.6, 13.5)	18.4	(12.9, 25.7)	12.3	(10.5, 14.3)
Connecticut	12.9	(10.2, 16.2)	15.6	(13.3, 18.3)	14.1	(12.3, 16.2)	21.1	(13.3, 31.9)	14.5	(12.7, 16.5)
Florida	9.6	(7.6, 12.1)	9.3	(7.8, 11.1)	8.6	(7.3, 10.1)	13.0	(9.6, 17.3)	9.4	(8.2, 10.9)
Georgia	13.7	(11.5, 16.2)	17.7	(15.8, 19.8)	14.7	(13.3, 16.3)	19.8	(15.9, 24.4)	16.0	(14.6, 17.6)
Indiana	13.8	(10.2, 18.3)	12.3	(9.9, 15.2)	12.9	(10.6, 15.5)	12.6	(7.1, 21.2)	12.9	(10.8, 15.4)
Iowa	12.3	(9.4, 16.0)	9.6	(7.8, 11.6)	10.8	(9.1, 12.7)	N/A	N/A	10.7	(9.1, 12.6)
Kansas	N/A	N/A	10.1	(8.1, 12.4)	9.3	(7.7, 11.2)	N/A	N/A	9.6	(8.0, 11.5)
Missouri	12.8	(9.8, 16.6)	14.6	(12.1, 17.5)	13.7	(11.6, 16.1)	17.1	(11.0, 25.6)	13.9	(11.9, 16.1)
Nebraska	N/A	N/A	13.6	(10.6, 17.3)	12.4	(10.1, 15.1)	N/A	N/A	12.7	(10.4, 15.4)
New Mexico	13.5	(10.6, 17.0)	15.7	(13.3, 18.6)	12.8	(10.8, 15.2)	19.2	(15.2, 23.9)	14.8	(12.8, 16.9)
New York	14.6	(12.1, 17.6)	12.8	(11.1, 14.8)	12.6	(11.1, 14.2)	18.1	(13.7, 23.7)	13.6	(12.1, 15.2)
North Carolina	10.9	(9.1, 13.0)	11.8	(10.5, 13.3)	10.7	(9.6, 11.9)	14.4	(11.4, 17.9)	11.4	(10.4, 12.6)
Ohio	12.4	(10.4, 14.8)	14.6	(12.9, 16.5)	13.4	(11.9, 14.9)	16.2	(12.1, 21.5)	13.7	(12.4, 15.2)
Tennessee	5.2	(3.8, 7.2)	5.6	(4.4, 7.0)	5.2	(4.3, 6.4)	6.9	(3.9, 11.9)	5.4	(4.5, 6.6)
Texas	12.2	(9.0, 16.4)	16.3	(12.8, 20.5)	13.1	(10.4, 16.4)	20.2	(14.2, 27.8)	14.6	(12.1, 17.6)
West Virginia	N/A	N/A	11.3	(9.2, 14.0)	10.9	(9.1, 13.1)	N/A	N/A	10.8	(9.0, 12.8)
Wyoming	12.8	(10.5, 15.6)	16.8	(14.7, 19.1)	15.1	(13.4, 16.9)	15.3	(8.8, 25.2)	15.0	(13.4, 16.7)
Total	11.4	(10.6, 12.3)	12.7	(12.0, 13.4)	11.4	(10.8, 12.0)	16.0	(14.3, 17.9)	12.1	(11.6, 12.7)

* Non-white includes non-Hispanic black, Hispanics, and non-Hispanic other.
† 95% confidence interval.
‡ N/A indicates that the estimate was not available, the unweighted sample size for denominator was <50, or the relative standard error was >0.30.

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