

Vision Problems in the U.S.

Prevalence of Adult Vision Impairment and Age-Related Eye Disease in America



2008 Update to the Fourth Edition



100 Years. Our Vision Is Vision.™

Founded in 1908, Prevent Blindness America is the nation's leading volunteer eye health and safety organization dedicated to fighting blindness and saving sight. Focused on promoting a continuum of vision care, Prevent Blindness America touches the lives of millions of people each year through public and professional education, advocacy, certified vision screening, training, community and patient service programs and research.

These services are made possible through the generous support of the American public. Together with a network of affiliates, divisions and chapters, Prevent Blindness America is committed to eliminating preventable blindness in the U.S.



The National Eye Institute (NEI), a component of the National Institutes of Health (NIH), supports and conducts research aimed at improving the prevention, treatment, and rehabilitation of diseases that affect the eye and vision. The NIH, a Federal government agency, is part of the U.S. Department of Health and Human Services. Research is conducted on the NIH campus in Bethesda, Maryland, and at universities, medical schools, hospitals, and other institutions throughout the United States and abroad.

Vision Problems in the U.S.
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Introduction Vision impairment is one of the most feared disabilities. Although it is believed that half of all blindness can be prevented, the number of people in America who suffer from vision loss continues to increase.

The leading causes of vision impairment and blindness in the United States are primarily age-related eye diseases. The number of Americans at risk for age-related eye diseases is increasing as the baby boomer generation ages. These conditions, including age-related macular degeneration, cataract, diabetic retinopathy and glaucoma, affect more Americans than ever before. Disturbingly, the number of Americans with age-related eye disease and the vision impairment that results is expected to double within the next three decades. As of the year 2004, there were estimated to be more than 130 million people in the United States in this age group. The table on the following pages provides an overview of the U.S. population age 40 and older by race and sex.

Awareness of vision impairment and its causes is important to all of us.

We must be aware of our own personal risk of vision loss and take steps to preserve and protect our precious eyesight. Our communities must be informed so they may prepare the treatment and rehabilitation services that will be needed. Most important, our nation's leaders must comprehend the scope of eye problems in our country so that adequate government resources can be devoted to research, treatment and prevention.

Vision Problems in the U.S., the 2008 Update to the Fourth Edition, provides useful estimates of the prevalence of sight-threatening eye diseases in Americans age 40 and older. This report includes information on the prevalence of blindness and vision impairment, significant refractive error, and the four leading eye diseases affecting older Americans: age-related macular degeneration, cataract, diabetic retinopathy and glaucoma.

The numbers in this 2008 Update to the Fourth Edition are slightly different from the numbers in the original fourth edition for two reasons. First, the projections in this edition use published prevalence rates (based primarily on the same studies as were used to generate the numbers for the original publication). Second, the projections in this edition use 2004 population projections rather than 2000 census data. The 2004 projections reflect the growth and changing racial, ethnic and age composition of the United States population.

U.S. Census 2004 Population

Age 40 and Older by State, Race and Sex

| State | Total | Female | Male | White | Black | Hispanic | Other |
|----------------------|-------------|------------|------------|------------|------------|------------|-----------|
| Total U.S. | 130,048,048 | 68,978,846 | 61,069,202 | 99,340,825 | 13,412,332 | 11,303,843 | 5,991,048 |
| Alabama | 2,071,075 | 1,115,005 | 956,070 | 1,571,897 | 451,889 | 22,488 | 24,801 |
| Alaska | 265,454 | 129,986 | 135,468 | 202,051 | 7,293 | 7,676 | 48,434 |
| Arizona | 2,405,858 | 1,257,539 | 1,148,319 | 1,832,191 | 63,499 | 385,184 | 124,984 |
| Arkansas | 1,255,239 | 668,756 | 586,483 | 1,060,658 | 152,929 | 24,421 | 17,231 |
| California | 14,727,069 | 7,718,106 | 7,008,963 | 8,559,134 | 906,735 | 3,267,756 | 1,993,444 |
| Colorado | 1,908,575 | 985,983 | 922,592 | 1,565,837 | 62,955 | 224,690 | 55,093 |
| Connecticut | 1,679,637 | 902,596 | 777,041 | 1,416,959 | 119,909 | 101,556 | 41,213 |
| Delaware | 382,017 | 203,450 | 178,567 | 300,475 | 62,013 | 10,369 | 9,160 |
| District of Columbia | 235,485 | 128,949 | 106,536 | 69,063 | 146,875 | 13,389 | 6,158 |
| Florida | 8,515,691 | 4,526,374 | 3,989,317 | 6,184,440 | 904,495 | 1,252,586 | 174,170 |
| Georgia | 3,544,731 | 1,883,897 | 1,660,834 | 2,466,138 | 876,644 | 111,710 | 90,239 |
| Hawaii | 591,052 | 311,724 | 279,328 | 169,049 | 7,408 | 24,174 | 390,421 |
| Idaho | 589,225 | 303,164 | 286,061 | 548,917 | 1,804 | 26,220 | 12,284 |
| Illinois | 5,500,934 | 2,935,552 | 2,565,382 | 4,174,178 | 700,981 | 422,455 | 203,320 |
| Indiana | 2,751,826 | 1,460,327 | 1,291,499 | 2,467,572 | 192,269 | 60,198 | 31,787 |
| Iowa | 1,397,723 | 739,587 | 658,136 | 1,340,549 | 20,143 | 21,598 | 15,433 |
| Kansas | 1,216,292 | 640,395 | 575,897 | 1,083,459 | 55,642 | 48,870 | 28,321 |
| Kentucky | 1,890,127 | 1,005,443 | 884,684 | 1,740,399 | 114,866 | 17,647 | 17,215 |
| Louisiana | 1,948,580 | 1,046,421 | 902,159 | 1,340,463 | 530,510 | 43,563 | 34,044 |
| Maine | 671,647 | 354,735 | 316,912 | 658,613 | 2,648 | 3,488 | 6,898 |
| Maryland | 2,507,094 | 1,347,975 | 1,159,119 | 1,684,609 | 627,230 | 79,660 | 115,595 |
| Massachusetts | 2,976,886 | 1,600,768 | 1,376,118 | 2,620,882 | 133,278 | 123,031 | 99,695 |
| Michigan | 4,558,748 | 2,413,457 | 2,145,291 | 3,839,817 | 531,131 | 91,441 | 96,359 |
| Minnesota | 2,281,798 | 1,188,617 | 1,093,181 | 2,130,562 | 53,756 | 34,962 | 62,518 |
| Mississippi | 1,248,788 | 673,835 | 574,953 | 850,345 | 372,712 | 13,185 | 12,546 |
| Missouri | 2,640,166 | 1,407,503 | 1,232,663 | 2,323,976 | 240,094 | 36,460 | 39,636 |
| Montana | 457,710 | 236,588 | 221,122 | 429,123 | 1,055 | 6,036 | 21,496 |
| Nebraska | 780,550 | 411,324 | 369,226 | 719,922 | 23,510 | 24,611 | 12,507 |
| Nevada | 989,474 | 498,162 | 491,312 | 735,196 | 61,182 | 121,292 | 71,804 |
| New Hampshire | 624,094 | 324,952 | 299,142 | 604,992 | 3,668 | 6,810 | 8,624 |
| New Jersey | 4,026,135 | 2,162,596 | 1,863,539 | 2,925,705 | 449,962 | 407,928 | 242,540 |
| New Mexico | 847,726 | 446,597 | 401,129 | 470,095 | 14,045 | 296,625 | 66,961 |
| New York | 8,746,820 | 4,735,175 | 4,011,645 | 6,038,595 | 1,165,442 | 1,007,242 | 535,541 |
| North Carolina | 3,725,433 | 1,996,481 | 1,728,952 | 2,851,491 | 696,496 | 89,198 | 88,248 |
| North Dakota | 300,686 | 157,325 | 143,361 | 287,316 | 884 | 1,923 | 10,563 |
| Ohio | 5,297,128 | 2,833,828 | 2,463,300 | 4,643,808 | 515,728 | 66,896 | 70,696 |
| Oklahoma | 1,584,104 | 839,158 | 744,946 | 1,312,747 | 94,672 | 48,422 | 128,263 |
| Oregon | 1,640,840 | 857,739 | 783,101 | 1,486,093 | 21,890 | 66,103 | 66,754 |
| Pennsylvania | 6,062,941 | 3,261,416 | 2,801,525 | 5,346,310 | 489,620 | 123,389 | 103,622 |
| Rhode Island | 506,313 | 273,698 | 232,615 | 450,199 | 17,925 | 27,324 | 10,865 |
| South Carolina | 1,885,379 | 1,013,319 | 872,060 | 1,363,136 | 471,068 | 27,856 | 23,319 |
| South Dakota | 353,344 | 184,383 | 168,961 | 330,213 | 1,444 | 3,246 | 18,441 |
| Tennessee | 2,681,788 | 1,432,133 | 1,249,655 | 2,258,401 | 354,901 | 35,414 | 33,072 |
| Texas | 8,871,622 | 4,645,473 | 4,226,149 | 5,521,246 | 908,697 | 2,140,900 | 300,779 |
| Utah | 795,338 | 410,343 | 384,995 | 712,601 | 5,254 | 50,917 | 26,566 |
| Vermont | 312,233 | 163,621 | 148,612 | 305,645 | 1,265 | 2,111 | 3,212 |
| Virginia | 3,333,499 | 1,769,536 | 1,563,963 | 2,516,265 | 575,215 | 103,377 | 138,642 |
| Washington | 2,767,216 | 1,437,187 | 1,330,029 | 2,378,415 | 74,757 | 111,173 | 202,871 |
| West Virginia | 913,208 | 484,025 | 429,183 | 876,705 | 25,234 | 4,992 | 6,277 |
| Wisconsin | 2,542,159 | 1,330,618 | 1,211,541 | 2,350,577 | 97,384 | 50,915 | 43,283 |
| Wyoming | 240,591 | 123,025 | 117,566 | 223,796 | 1,326 | 10,366 | 5,103 |

| White Female | White Male | Black Female | Black Male | Hisp. Female | Hisp. Male | Other Female | Other Male | State |
|--------------|------------|--------------|------------|--------------|------------|--------------|------------|----------------------|
| 52,474,400 | 46,866,425 | 7,484,533 | 5,927,799 | 5,805,226 | 5,498,617 | 3,214,687 | 2,776,361 | Total U.S. |
| 833,702 | 738,195 | 257,251 | 194,638 | 10,456 | 12,032 | 13,596 | 11,205 | Alabama |
| 96,893 | 105,158 | 3,500 | 3,793 | 3,758 | 3,918 | 25,835 | 22,599 | Alaska |
| 961,894 | 870,297 | 31,359 | 32,140 | 195,014 | 190,170 | 69,272 | 55,712 | Arizona |
| 562,477 | 498,181 | 85,774 | 67,155 | 11,148 | 13,273 | 9,357 | 7,874 | Arkansas |
| 4,468,053 | 4,091,081 | 486,179 | 420,556 | 1,683,684 | 1,584,072 | 1,080,190 | 913,254 | California |
| 812,521 | 753,316 | 30,866 | 32,089 | 112,210 | 112,480 | 30,386 | 24,707 | Colorado |
| 759,478 | 657,481 | 67,779 | 52,130 | 54,186 | 47,370 | 21,153 | 20,060 | Connecticut |
| 159,056 | 141,419 | 34,506 | 27,507 | 5,019 | 5,350 | 4,869 | 4,291 | Delaware |
| 33,868 | 35,195 | 84,761 | 62,114 | 6,861 | 6,528 | 3,459 | 2,699 | District of Columbia |
| 3,270,114 | 2,914,326 | 495,800 | 408,695 | 664,895 | 587,691 | 95,565 | 78,605 | Florida |
| 1,294,997 | 1,171,141 | 492,482 | 384,162 | 48,932 | 62,778 | 47,486 | 42,753 | Georgia |
| 82,946 | 86,103 | 2,917 | 4,491 | 12,659 | 11,515 | 213,202 | 177,219 | Hawaii |
| 283,527 | 265,390 | 716 | 1,088 | 12,193 | 14,027 | 6,728 | 5,556 | Idaho |
| 2,222,201 | 1,951,977 | 400,555 | 300,426 | 205,285 | 217,170 | 107,511 | 95,809 | Illinois |
| 1,308,485 | 1,159,087 | 106,588 | 85,681 | 28,371 | 31,827 | 16,883 | 14,904 | Indiana |
| 711,066 | 629,483 | 10,050 | 10,093 | 10,141 | 11,457 | 8,330 | 7,103 | Iowa |
| 572,488 | 510,971 | 29,443 | 26,199 | 23,380 | 25,490 | 15,084 | 13,237 | Kansas |
| 925,399 | 815,000 | 63,041 | 51,825 | 7,897 | 9,750 | 9,106 | 8,109 | Kentucky |
| 707,518 | 632,945 | 298,770 | 231,740 | 22,505 | 21,058 | 17,628 | 16,416 | Louisiana |
| 348,023 | 310,590 | 1,095 | 1,553 | 1,814 | 1,674 | 3,803 | 3,095 | Maine |
| 890,566 | 794,043 | 354,164 | 273,066 | 41,397 | 38,263 | 61,848 | 53,747 | Maryland |
| 1,410,362 | 1,210,520 | 72,642 | 60,636 | 66,356 | 56,675 | 51,408 | 48,287 | Massachusetts |
| 2,020,424 | 1,819,393 | 298,279 | 232,852 | 44,776 | 46,665 | 49,978 | 46,381 | Michigan |
| 1,113,672 | 1,016,890 | 25,957 | 27,799 | 16,066 | 18,896 | 32,922 | 29,596 | Minnesota |
| 450,915 | 399,430 | 209,984 | 162,728 | 5,987 | 7,198 | 6,949 | 5,597 | Mississippi |
| 1,231,906 | 1,092,070 | 136,232 | 103,862 | 18,017 | 18,443 | 21,348 | 18,288 | Missouri |
| 221,362 | 207,761 | 410 | 645 | 3,175 | 2,861 | 11,641 | 9,855 | Montana |
| 380,519 | 339,403 | 12,473 | 11,037 | 11,426 | 13,185 | 6,906 | 5,601 | Nebraska |
| 368,058 | 367,138 | 31,184 | 29,998 | 58,609 | 62,683 | 40,311 | 31,493 | Nevada |
| 315,245 | 289,747 | 1,638 | 2,030 | 3,535 | 3,275 | 4,534 | 4,090 | New Hampshire |
| 1,568,499 | 1,357,206 | 254,934 | 195,028 | 213,754 | 194,174 | 125,409 | 117,131 | New Jersey |
| 247,963 | 222,132 | 6,622 | 7,423 | 154,759 | 141,866 | 37,253 | 29,708 | New Mexico |
| 3,233,606 | 2,804,989 | 676,326 | 489,116 | 550,508 | 456,734 | 274,735 | 260,806 | New York |
| 1,517,457 | 1,334,034 | 393,169 | 303,327 | 38,141 | 51,057 | 47,714 | 40,534 | North Carolina |
| 150,176 | 137,140 | 324 | 560 | 976 | 947 | 5,849 | 4,714 | North Dakota |
| 2,473,535 | 2,170,273 | 289,102 | 226,626 | 33,694 | 33,202 | 37,497 | 33,199 | Ohio |
| 695,824 | 616,923 | 51,042 | 43,630 | 22,802 | 25,620 | 69,490 | 58,773 | Oklahoma |
| 780,608 | 705,485 | 10,423 | 11,467 | 30,496 | 35,607 | 36,212 | 30,542 | Oregon |
| 2,865,709 | 2,480,601 | 278,455 | 211,165 | 63,004 | 60,385 | 54,248 | 49,374 | Pennsylvania |
| 243,880 | 206,319 | 9,324 | 8,601 | 14,833 | 12,491 | 5,661 | 5,204 | Rhode Island |
| 721,591 | 641,545 | 266,390 | 204,678 | 12,432 | 15,424 | 12,906 | 10,413 | South Carolina |
| 172,249 | 157,964 | 495 | 949 | 1,549 | 1,697 | 10,090 | 8,351 | South Dakota |
| 1,198,212 | 1,060,189 | 200,527 | 154,374 | 15,701 | 19,713 | 17,693 | 15,379 | Tennessee |
| 2,890,115 | 2,631,131 | 497,181 | 411,516 | 1,100,096 | 1,040,804 | 158,081 | 142,698 | Texas |
| 369,149 | 343,452 | 2,157 | 3,097 | 24,682 | 26,235 | 14,355 | 12,211 | Utah |
| 160,241 | 145,404 | 548 | 717 | 1,087 | 1,024 | 1,745 | 1,467 | Vermont |
| 1,322,866 | 1,193,399 | 318,120 | 257,095 | 52,428 | 50,949 | 76,122 | 62,520 | Virginia |
| 1,236,211 | 1,142,204 | 34,874 | 39,883 | 52,970 | 58,203 | 113,132 | 89,739 | Washington |
| 464,627 | 412,078 | 13,597 | 11,637 | 2,493 | 2,499 | 3,308 | 2,969 | West Virginia |
| 1,229,659 | 1,120,918 | 53,952 | 43,432 | 23,952 | 26,963 | 23,055 | 20,228 | Wisconsin |
| 114,488 | 109,308 | 576 | 750 | 5,117 | 5,249 | 2,844 | 2,259 | Wyoming |

Vision Impairment and Blindness

The term "blindness" can have many connotations and is difficult to define precisely. To many people, blindness refers to the complete loss of vision with no remaining perception of light. However, this ultimate form of complete blindness is rare. Far more people have permanent loss of some, but not all, of their eyesight. The severity of vision loss can vary widely and may result in equally varying degrees of functional impairment.

"Legal blindness" represents an artificial distinction and has little value for rehabilitation, but it is significant in that it determines eligibility for certain disability benefits from the federal government. In the United States, it is typically defined as visual acuity with best correction in the better eye worse than or equal to 20/200 or a visual field extent of less than 20 degrees in diameter. These overly simple criteria for visual impairment are far from comprehensive in defining the visual function deficits that can cause difficulties for daily living tasks.

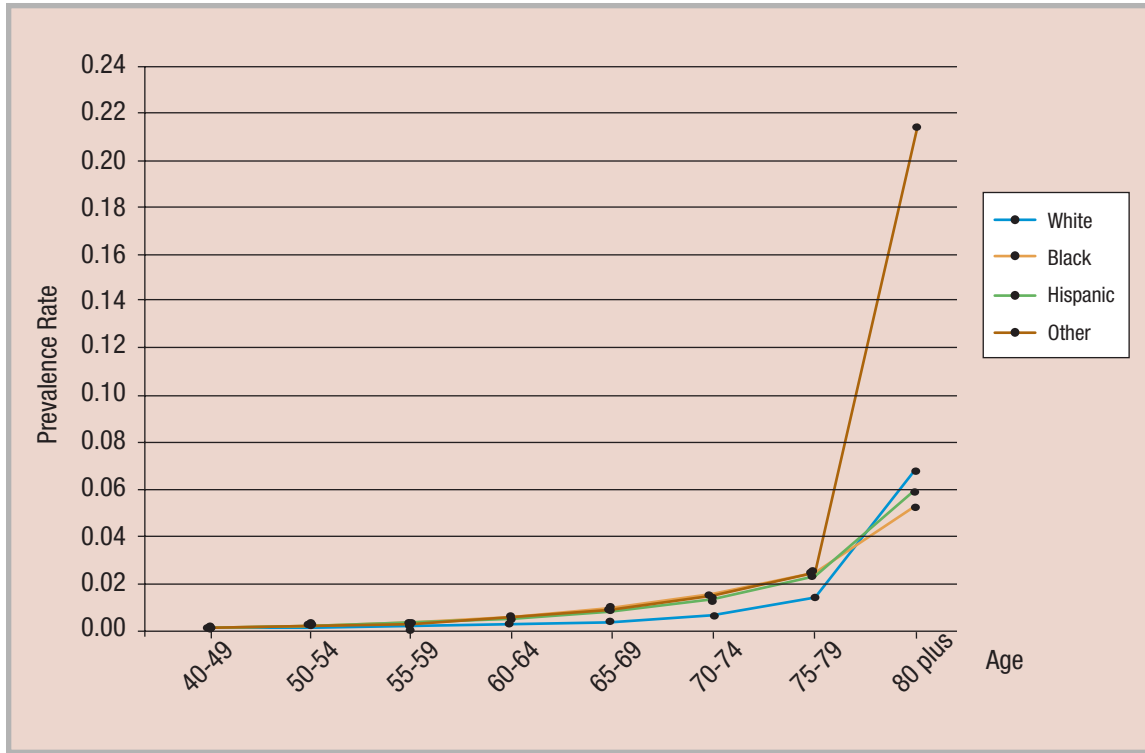
Vision impairment is defined as having 20/40 or worse vision in the better eye even with eyeglasses. People with the least degree of vision impairment may still face challenges in everyday life. For instance, people with vision worse than 20/40 cannot obtain an unrestricted driver's license in most states.

Almost everyone with blindness or vision impairment can benefit from vision rehabilitation, which can help make the most of whatever vision remains.

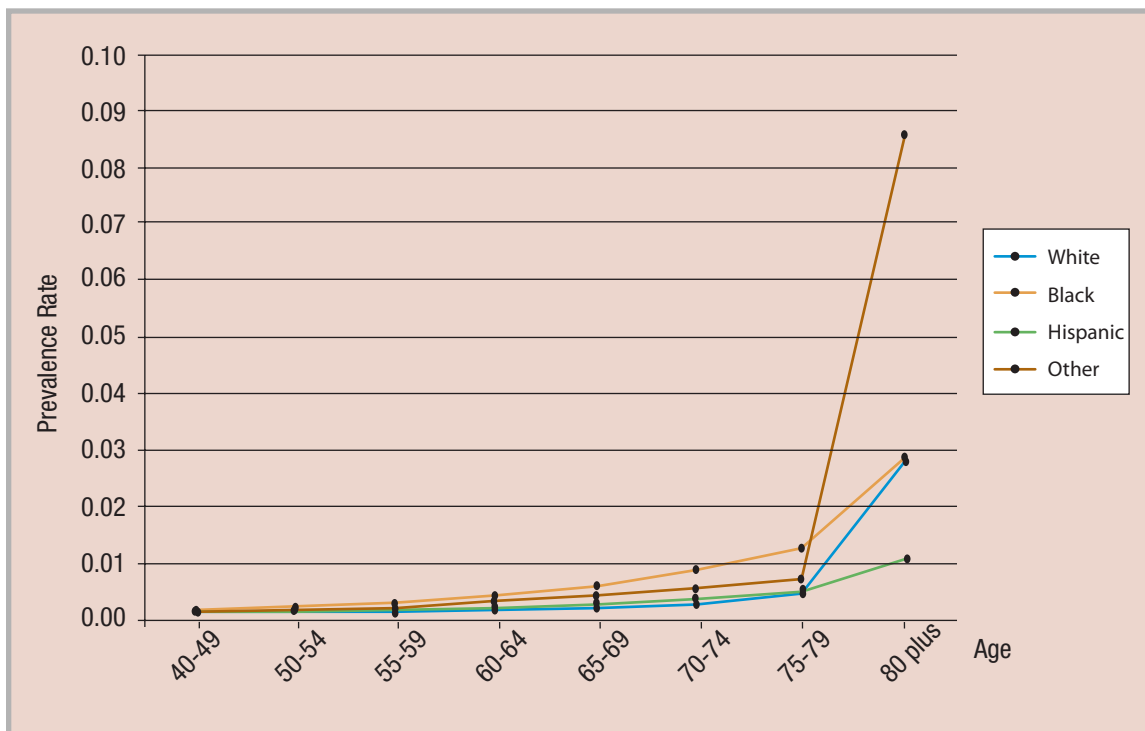
Unfortunately, blindness and vision impairment represent a significant burden, not only to those affected by sight loss, but to our national economy as well. Prevent Blindness America's 2007 study, *The Economic Impact of Vision Problems: The Toll of Major Adult Eye Disorders, Visual Impairment and Blindness on the U.S. Economy* estimates the costs associated with adult vision problems in the United States at \$51.4 billion.

Blindness, as defined above, affects more than one million Americans age 40 and older (see table on pages 8 and 9). The visually impaired, including those who are blind, total more than 3.6 million older Americans (see table on pages 6 and 7). Blindness affects Blacks more frequently than Whites and Hispanics (see chart on page 5). Hispanics, however, have higher rates of vision impairment than other races. The prevalence of blindness and vision impairment increases rapidly in the later years, particularly after age 75.

Estimated Specific Prevalence Rates for Vision Impairment and Blindness



Vision Impairment



Blindness

Estimated Number of Cases of Vision Impairment (including Blindness) in the U.S. Population Age 40 and Older by State, Race and Sex

| State | Total | Female | Male | White | Black | Hispanic | Other |
|----------------------|-----------|-----------|-----------|-----------|---------|----------|---------|
| Total U.S. | 3,638,186 | 2,380,848 | 1,257,338 | 2,829,010 | 303,016 | 226,139 | 280,021 |
| Alabama | 52,935 | 34,399 | 18,536 | 40,545 | 11,150 | 437 | 803 |
| Alaska | 4,692 | 2,943 | 1,749 | 2,665 | 101 | 92 | 1,834 |
| Arizona | 67,811 | 43,406 | 24,405 | 54,371 | 1,239 | 7,110 | 5,091 |
| Arkansas | 33,898 | 22,388 | 11,510 | 29,142 | 3,781 | 366 | 609 |
| California | 447,807 | 286,641 | 161,166 | 255,851 | 20,236 | 63,380 | 108,340 |
| Colorado | 43,715 | 28,557 | 15,158 | 35,939 | 1,184 | 4,425 | 2,167 |
| Connecticut | 50,957 | 34,242 | 16,715 | 45,308 | 2,525 | 1,744 | 1,380 |
| Delaware | 10,102 | 6,515 | 3,587 | 8,323 | 1,296 | 167 | 316 |
| District of Columbia | 7,061 | 4,139 | 2,922 | 1,875 | 4,604 | 258 | 324 |
| Florida | 275,412 | 175,135 | 100,277 | 217,181 | 18,809 | 33,257 | 6,165 |
| Georgia | 77,450 | 50,149 | 27,301 | 56,253 | 17,172 | 1,564 | 2,461 |
| Hawaii | 40,343 | 25,504 | 14,839 | 4,129 | 123 | 439 | 35,652 |
| Idaho | 14,999 | 9,727 | 5,272 | 14,057 | 25 | 370 | 547 |
| Illinois | 154,097 | 102,057 | 52,040 | 122,765 | 16,342 | 6,811 | 8,179 |
| Indiana | 73,682 | 49,506 | 24,176 | 67,013 | 4,562 | 1,059 | 1,048 |
| Iowa | 43,716 | 29,648 | 14,068 | 42,516 | 405 | 352 | 443 |
| Kansas | 35,912 | 23,924 | 11,988 | 32,802 | 1,264 | 874 | 972 |
| Kentucky | 46,133 | 31,050 | 15,083 | 42,638 | 2,683 | 297 | 515 |
| Louisiana | 49,218 | 31,266 | 17,952 | 34,645 | 12,265 | 1,053 | 1,255 |
| Maine | 17,655 | 11,802 | 5,853 | 17,361 | 44 | 67 | 183 |
| Maryland | 65,204 | 41,564 | 23,640 | 46,579 | 12,728 | 1,399 | 4,498 |
| Massachusetts | 89,861 | 60,970 | 28,891 | 80,917 | 2,809 | 2,037 | 4,098 |
| Michigan | 123,101 | 80,826 | 42,275 | 105,210 | 12,916 | 1,691 | 3,284 |
| Minnesota | 62,252 | 41,618 | 20,634 | 58,867 | 763 | 506 | 2,116 |
| Mississippi | 31,505 | 20,217 | 11,288 | 21,997 | 8,778 | 267 | 463 |
| Missouri | 72,234 | 48,018 | 24,216 | 64,498 | 5,573 | 679 | 1,484 |
| Montana | 12,012 | 7,849 | 4,163 | 11,167 | 18 | 109 | 718 |
| Nebraska | 22,959 | 15,336 | 7,623 | 21,668 | 482 | 383 | 426 |
| Nevada | 23,018 | 14,168 | 8,850 | 17,033 | 1,288 | 1,943 | 2,754 |
| New Hampshire | 15,109 | 10,022 | 5,087 | 14,675 | 55 | 111 | 268 |
| New Jersey | 118,155 | 78,243 | 39,912 | 91,913 | 10,130 | 7,732 | 8,380 |
| New Mexico | 23,122 | 14,872 | 8,250 | 12,814 | 318 | 7,128 | 2,862 |
| New York | 259,421 | 171,568 | 87,853 | 188,443 | 27,377 | 21,297 | 22,304 |
| North Carolina | 94,758 | 62,098 | 32,660 | 73,944 | 16,428 | 1,183 | 3,203 |
| North Dakota | 9,495 | 6,401 | 3,094 | 9,133 | 2 | 36 | 324 |
| Ohio | 148,515 | 98,864 | 49,651 | 131,722 | 12,897 | 1,309 | 2,587 |
| Oklahoma | 44,909 | 29,472 | 15,437 | 35,853 | 2,069 | 731 | 6,256 |
| Oregon | 46,769 | 30,712 | 16,057 | 42,504 | 445 | 982 | 2,838 |
| Pennsylvania | 193,167 | 130,152 | 63,015 | 174,171 | 12,851 | 2,221 | 3,924 |
| Rhode Island | 16,566 | 11,316 | 5,250 | 15,280 | 366 | 466 | 454 |
| South Carolina | 46,972 | 30,160 | 16,812 | 34,626 | 11,138 | 452 | 756 |
| South Dakota | 11,162 | 7,474 | 3,688 | 10,432 | 22 | 56 | 652 |
| Tennessee | 65,673 | 43,632 | 22,041 | 56,354 | 7,778 | 562 | 979 |
| Texas | 210,636 | 135,861 | 74,775 | 139,023 | 18,671 | 43,497 | 9,445 |
| Utah | 19,289 | 12,311 | 6,978 | 17,255 | 92 | 832 | 1,110 |
| Vermont | 7,664 | 5,085 | 2,579 | 7,497 | 20 | 54 | 93 |
| Virginia | 81,444 | 52,555 | 28,889 | 61,953 | 13,320 | 1,531 | 4,640 |
| Washington | 74,493 | 48,709 | 25,784 | 62,717 | 1,341 | 1,640 | 8,795 |
| West Virginia | 24,651 | 16,506 | 8,145 | 23,506 | 737 | 134 | 274 |
| Wisconsin | 70,901 | 47,650 | 23,251 | 66,728 | 1,739 | 827 | 1,607 |
| Wyoming | 5,548 | 3,592 | 1,956 | 5,141 | 27 | 213 | 167 |

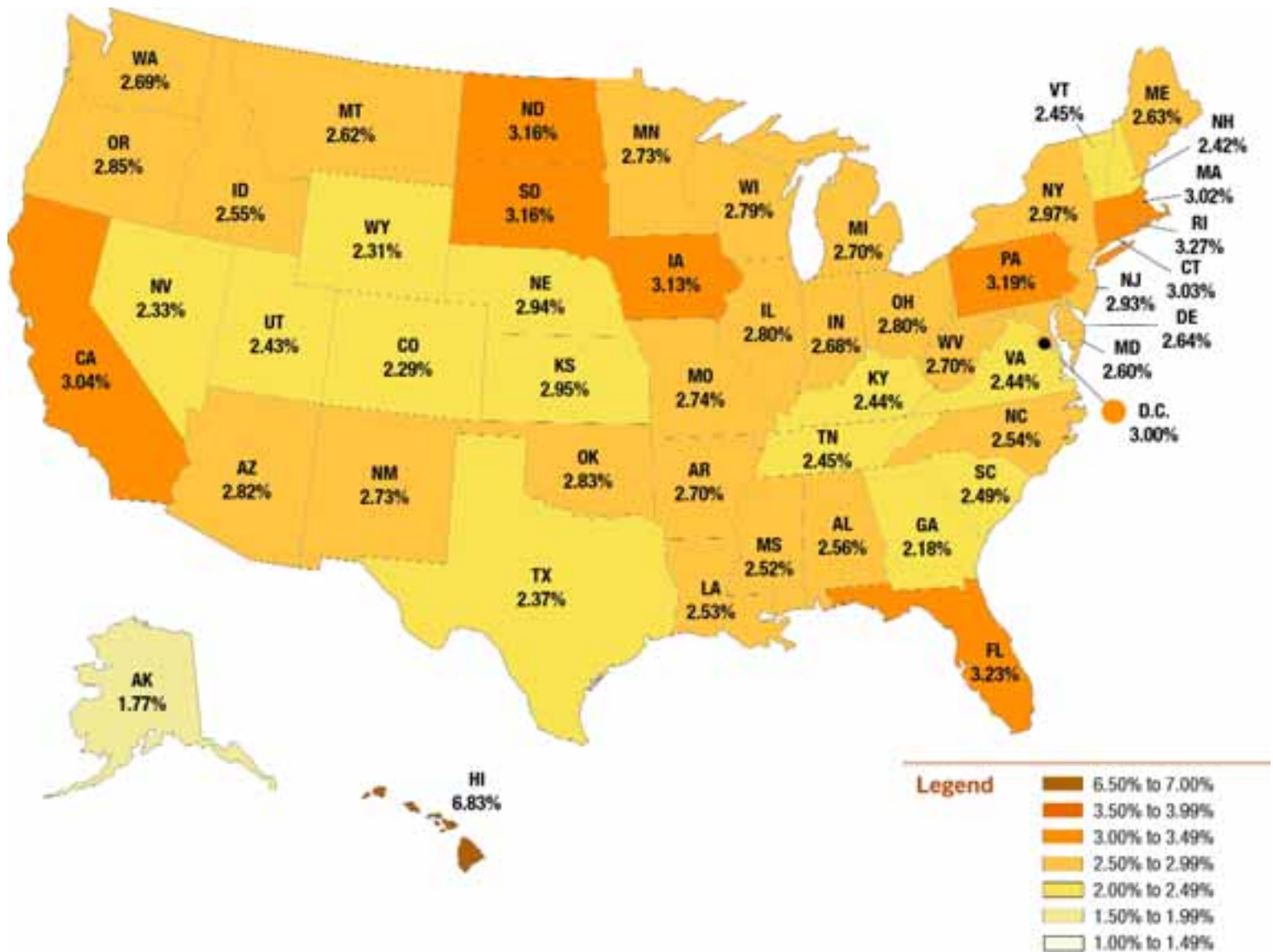
| White Female | White Male | Black Female | Black Male | Hisp. Female | Hisp. Male | Other Female | Other Male | State |
|--------------|------------|--------------|------------|--------------|------------|--------------|------------|----------------------|
| 1,904,562 | 924,448 | 156,904 | 146,112 | 145,130 | 81,009 | 174,252 | 105,769 | Total U.S. |
| 27,655 | 12,890 | 5,977 | 5,173 | 268 | 169 | 499 | 304 | Alabama |
| 1,649 | 1,016 | 42 | 59 | 55 | 37 | 1,197 | 637 | Alaska |
| 35,084 | 19,287 | 570 | 669 | 4,487 | 2,623 | 3,265 | 1,826 | Arizona |
| 19,774 | 9,368 | 2,026 | 1,755 | 215 | 151 | 373 | 236 | Arkansas |
| 169,324 | 86,527 | 10,025 | 10,211 | 40,605 | 22,775 | 66,687 | 41,653 | California |
| 23,866 | 12,073 | 549 | 635 | 2,774 | 1,651 | 1,368 | 799 | Colorado |
| 30,950 | 14,358 | 1,310 | 1,215 | 1,138 | 606 | 844 | 536 | Connecticut |
| 5,574 | 2,749 | 657 | 639 | 101 | 66 | 183 | 133 | Delaware |
| 1,236 | 639 | 2,506 | 2,098 | 178 | 80 | 219 | 105 | District of Columbia |
| 140,165 | 77,016 | 9,398 | 9,411 | 21,797 | 11,460 | 3,775 | 2,390 | Florida |
| 38,552 | 17,701 | 9,146 | 8,026 | 931 | 633 | 1,520 | 941 | Georgia |
| 2,588 | 1,541 | 46 | 77 | 278 | 161 | 22,592 | 13,060 | Hawaii |
| 9,167 | 4,890 | 8 | 17 | 214 | 156 | 338 | 209 | Idaho |
| 84,373 | 38,392 | 8,416 | 7,926 | 4,130 | 2,681 | 5,138 | 3,041 | Illinois |
| 45,902 | 21,111 | 2,313 | 2,249 | 626 | 433 | 665 | 383 | Indiana |
| 28,976 | 13,540 | 193 | 212 | 212 | 140 | 267 | 176 | Iowa |
| 22,152 | 10,650 | 624 | 640 | 534 | 340 | 614 | 358 | Kansas |
| 29,162 | 13,476 | 1,393 | 1,290 | 178 | 119 | 317 | 198 | Kentucky |
| 23,506 | 11,139 | 6,315 | 5,950 | 710 | 343 | 735 | 520 | Louisiana |
| 11,623 | 5,738 | 18 | 26 | 44 | 23 | 117 | 66 | Maine |
| 31,384 | 15,195 | 6,503 | 6,225 | 921 | 478 | 2,756 | 1,742 | Maryland |
| 55,684 | 25,233 | 1,425 | 1,384 | 1,332 | 705 | 2,529 | 1,569 | Massachusetts |
| 71,256 | 33,954 | 6,511 | 6,405 | 1,025 | 666 | 2,034 | 1,250 | Michigan |
| 39,656 | 19,211 | 342 | 421 | 300 | 206 | 1,320 | 796 | Minnesota |
| 15,193 | 6,804 | 4,584 | 4,194 | 165 | 102 | 275 | 188 | Mississippi |
| 43,752 | 20,746 | 2,919 | 2,654 | 422 | 257 | 925 | 559 | Missouri |
| 7,298 | 3,869 | 7 | 11 | 68 | 41 | 476 | 242 | Montana |
| 14,605 | 7,063 | 235 | 247 | 224 | 159 | 272 | 154 | Nebraska |
| 10,679 | 6,354 | 573 | 715 | 1,191 | 752 | 1,725 | 1,029 | Nevada |
| 9,763 | 4,912 | 21 | 34 | 71 | 40 | 167 | 101 | New Hampshire |
| 62,757 | 29,156 | 5,251 | 4,879 | 5,059 | 2,673 | 5,176 | 3,204 | New Jersey |
| 8,375 | 4,439 | 144 | 174 | 4,524 | 2,604 | 1,829 | 1,033 | New Mexico |
| 128,590 | 59,853 | 14,876 | 12,501 | 14,506 | 6,791 | 13,596 | 8,708 | New York |
| 50,473 | 23,471 | 8,839 | 7,589 | 687 | 496 | 2,099 | 1,104 | North Carolina |
| 6,164 | 2,969 | 1 | 1 | 23 | 13 | 213 | 111 | North Dakota |
| 89,823 | 41,899 | 6,590 | 6,307 | 810 | 499 | 1,641 | 946 | Ohio |
| 23,914 | 11,939 | 1,029 | 1,040 | 430 | 301 | 4,099 | 2,157 | Oklahoma |
| 28,121 | 14,383 | 212 | 233 | 587 | 395 | 1,792 | 1,046 | Oregon |
| 119,480 | 54,691 | 6,872 | 5,979 | 1,400 | 821 | 2,400 | 1,524 | Pennsylvania |
| 10,552 | 4,728 | 173 | 193 | 311 | 155 | 280 | 174 | Rhode Island |
| 23,482 | 11,144 | 5,901 | 5,237 | 275 | 177 | 502 | 254 | South Carolina |
| 6,989 | 3,443 | 7 | 15 | 36 | 20 | 442 | 210 | South Dakota |
| 38,560 | 17,794 | 4,106 | 3,672 | 342 | 220 | 624 | 355 | Tennessee |
| 92,856 | 46,167 | 9,491 | 9,180 | 27,729 | 15,768 | 5,785 | 3,660 | Texas |
| 11,105 | 6,150 | 34 | 58 | 516 | 316 | 656 | 454 | Utah |
| 4,988 | 2,509 | 6 | 14 | 34 | 20 | 57 | 36 | Vermont |
| 41,816 | 20,137 | 6,835 | 6,485 | 983 | 548 | 2,921 | 1,719 | Virginia |
| 41,526 | 21,191 | 587 | 754 | 977 | 663 | 5,619 | 3,176 | Washington |
| 15,850 | 7,656 | 402 | 335 | 85 | 49 | 169 | 105 | West Virginia |
| 45,238 | 21,490 | 862 | 877 | 493 | 334 | 1,057 | 550 | Wisconsin |
| 3,344 | 1,797 | 10 | 17 | 130 | 83 | 108 | 59 | Wyoming |

Estimated Number of Cases of Blindness in the U.S. Population Age 40 and Older by State, Race and Sex

| State | Total | Female | Male | White | Black | Hispanic | Other |
|----------------------|-----------|---------|---------|---------|---------|----------|--------|
| Total U.S. | 1,035,100 | 652,292 | 382,808 | 794,099 | 129,790 | 31,009 | 80,202 |
| Alabama | 16,232 | 9,709 | 6,523 | 11,254 | 4,686 | 60 | 232 |
| Alaska | 1,336 | 829 | 507 | 744 | 49 | 17 | 526 |
| Arizona | 18,145 | 11,464 | 6,681 | 15,143 | 558 | 987 | 1,457 |
| Arkansas | 9,929 | 6,296 | 3,633 | 8,108 | 1,592 | 53 | 176 |
| California | 120,684 | 74,639 | 46,045 | 72,218 | 8,811 | 8,693 | 30,962 |
| Colorado | 11,857 | 7,621 | 4,236 | 10,088 | 534 | 613 | 622 |
| Connecticut | 14,564 | 9,607 | 4,957 | 12,841 | 1,087 | 238 | 398 |
| Delaware | 2,999 | 1,834 | 1,165 | 2,322 | 563 | 23 | 91 |
| District of Columbia | 2,547 | 1,171 | 1,376 | 530 | 1,892 | 32 | 93 |
| Florida | 75,132 | 45,801 | 29,331 | 60,705 | 8,190 | 4,470 | 1,767 |
| Georgia | 24,022 | 14,186 | 9,836 | 15,676 | 7,412 | 223 | 711 |
| Hawaii | 11,464 | 7,213 | 4,251 | 1,163 | 60 | 62 | 10,179 |
| Idaho | 4,169 | 2,718 | 1,451 | 3,944 | 12 | 54 | 159 |
| Illinois | 44,885 | 28,444 | 16,441 | 34,594 | 6,975 | 966 | 2,350 |
| Indiana | 21,210 | 13,947 | 7,263 | 18,802 | 1,956 | 150 | 302 |
| Iowa | 12,359 | 8,412 | 3,947 | 12,001 | 181 | 50 | 127 |
| Kansas | 10,205 | 6,729 | 3,476 | 9,252 | 551 | 123 | 279 |
| Kentucky | 13,225 | 8,740 | 4,485 | 11,889 | 1,146 | 44 | 146 |
| Louisiana | 15,414 | 8,802 | 6,612 | 9,659 | 5,252 | 141 | 362 |
| Maine | 4,935 | 3,322 | 1,613 | 4,856 | 20 | 7 | 52 |
| Maryland | 20,140 | 11,796 | 8,344 | 13,122 | 5,536 | 190 | 1,292 |
| Massachusetts | 25,531 | 17,166 | 8,365 | 22,854 | 1,220 | 281 | 1,176 |
| Michigan | 36,295 | 22,859 | 13,436 | 29,571 | 5,543 | 236 | 945 |
| Minnesota | 17,664 | 11,819 | 5,845 | 16,620 | 360 | 72 | 612 |
| Mississippi | 10,009 | 5,734 | 4,275 | 6,102 | 3,736 | 37 | 134 |
| Missouri | 20,958 | 13,558 | 7,400 | 18,072 | 2,367 | 93 | 426 |
| Montana | 3,360 | 2,211 | 1,149 | 3,129 | 8 | 17 | 206 |
| Nebraska | 6,490 | 4,322 | 2,168 | 6,097 | 213 | 55 | 125 |
| Nevada | 6,339 | 3,772 | 2,567 | 4,705 | 577 | 276 | 781 |
| New Hampshire | 4,245 | 2,830 | 1,415 | 4,124 | 26 | 18 | 77 |
| New Jersey | 33,721 | 21,461 | 12,260 | 25,922 | 4,329 | 1,059 | 2,411 |
| New Mexico | 5,509 | 3,417 | 2,092 | 3,575 | 141 | 971 | 822 |
| New York | 73,787 | 46,436 | 27,351 | 53,031 | 11,494 | 2,864 | 6,398 |
| North Carolina | 28,636 | 17,533 | 11,103 | 20,611 | 6,931 | 171 | 923 |
| North Dakota | 2,671 | 1,817 | 854 | 2,574 | 1 | 3 | 93 |
| Ohio | 43,417 | 27,980 | 15,437 | 37,008 | 5,484 | 181 | 744 |
| Oklahoma | 12,786 | 8,251 | 4,535 | 9,989 | 900 | 106 | 1,791 |
| Oregon | 13,123 | 8,633 | 4,490 | 11,972 | 199 | 139 | 813 |
| Pennsylvania | 55,869 | 36,829 | 19,040 | 49,057 | 5,374 | 308 | 1,130 |
| Rhode Island | 4,691 | 3,185 | 1,506 | 4,334 | 162 | 64 | 131 |
| South Carolina | 14,639 | 8,544 | 6,095 | 9,630 | 4,727 | 64 | 218 |
| South Dakota | 3,145 | 2,120 | 1,025 | 2,941 | 12 | 5 | 187 |
| Tennessee | 19,383 | 12,307 | 7,076 | 15,700 | 3,321 | 79 | 283 |
| Texas | 55,635 | 33,747 | 21,888 | 38,825 | 8,117 | 5,974 | 2,719 |
| Utah | 5,308 | 3,388 | 1,920 | 4,826 | 46 | 117 | 319 |
| Vermont | 2,142 | 1,433 | 709 | 2,101 | 10 | 4 | 27 |
| Virginia | 24,595 | 14,815 | 9,780 | 17,338 | 5,710 | 213 | 1,334 |
| Washington | 21,081 | 13,720 | 7,361 | 17,705 | 621 | 234 | 2,521 |
| West Virginia | 6,942 | 4,630 | 2,312 | 6,539 | 305 | 18 | 80 |
| Wisconsin | 20,147 | 13,488 | 6,659 | 18,797 | 769 | 118 | 463 |
| Wyoming | 1,527 | 991 | 536 | 1,435 | 12 | 30 | 50 |

| White Female | White Male | Black Female | Black Male | Hisp. Female | Hisp. Male | Other Female | Other Male | State |
|--------------|------------|--------------|------------|--------------|------------|--------------|------------|----------------------|
| 539,404 | 254,695 | 47,246 | 82,544 | 15,923 | 15,086 | 49,719 | 30,483 | Total U.S. |
| 7,752 | 3,502 | 1,784 | 2,902 | 29 | 31 | 144 | 88 | Alabama |
| 466 | 278 | 13 | 36 | 8 | 9 | 342 | 184 | Alaska |
| 9,864 | 5,279 | 174 | 384 | 494 | 493 | 932 | 525 | Arizona |
| 5,560 | 2,548 | 605 | 987 | 24 | 29 | 107 | 69 | Arkansas |
| 48,163 | 24,055 | 3,029 | 5,782 | 4,456 | 4,237 | 18,991 | 11,971 | California |
| 6,758 | 3,330 | 168 | 366 | 305 | 308 | 390 | 232 | Colorado |
| 8,843 | 3,998 | 397 | 690 | 125 | 113 | 242 | 156 | Connecticut |
| 1,571 | 751 | 200 | 363 | 11 | 12 | 52 | 39 | Delaware |
| 354 | 176 | 735 | 1,157 | 19 | 13 | 63 | 30 | District of Columbia |
| 39,507 | 21,198 | 2,848 | 5,342 | 2,369 | 2,101 | 1,077 | 690 | Florida |
| 10,852 | 4,824 | 2,795 | 4,617 | 102 | 121 | 437 | 274 | Georgia |
| 734 | 429 | 15 | 45 | 31 | 31 | 6,433 | 3,746 | Hawaii |
| 2,596 | 1,348 | 1 | 11 | 23 | 31 | 98 | 61 | Idaho |
| 23,985 | 10,609 | 2,529 | 4,446 | 459 | 507 | 1,471 | 879 | Illinois |
| 12,994 | 5,808 | 694 | 1,262 | 69 | 81 | 190 | 112 | Indiana |
| 8,254 | 3,747 | 59 | 122 | 23 | 27 | 76 | 51 | Iowa |
| 6,305 | 2,947 | 188 | 363 | 60 | 63 | 176 | 103 | Kansas |
| 8,211 | 3,678 | 418 | 728 | 21 | 23 | 90 | 56 | Kentucky |
| 6,614 | 3,045 | 1,900 | 3,352 | 77 | 64 | 211 | 151 | Louisiana |
| 3,280 | 1,576 | 5 | 15 | 4 | 3 | 33 | 19 | Maine |
| 8,918 | 4,204 | 1,989 | 3,547 | 100 | 90 | 789 | 503 | Maryland |
| 15,863 | 6,991 | 432 | 788 | 148 | 133 | 723 | 453 | Massachusetts |
| 20,209 | 9,362 | 1,955 | 3,588 | 112 | 124 | 583 | 362 | Michigan |
| 11,298 | 5,322 | 108 | 252 | 33 | 39 | 380 | 232 | Minnesota |
| 4,263 | 1,839 | 1,374 | 2,362 | 18 | 19 | 79 | 55 | Mississippi |
| 12,374 | 5,698 | 875 | 1,492 | 45 | 48 | 264 | 162 | Missouri |
| 2,066 | 1,063 | 1 | 7 | 8 | 9 | 136 | 70 | Montana |
| 4,146 | 1,951 | 71 | 142 | 26 | 29 | 79 | 46 | Nebraska |
| 2,980 | 1,725 | 173 | 404 | 132 | 144 | 487 | 294 | Nevada |
| 2,767 | 1,357 | 6 | 20 | 9 | 9 | 48 | 29 | New Hampshire |
| 17,843 | 8,079 | 1,580 | 2,749 | 558 | 501 | 1,480 | 931 | New Jersey |
| 2,359 | 1,216 | 42 | 99 | 493 | 478 | 523 | 299 | New Mexico |
| 36,502 | 16,529 | 4,457 | 7,037 | 1,594 | 1,270 | 3,883 | 2,515 | New York |
| 14,208 | 6,403 | 2,647 | 4,284 | 76 | 95 | 602 | 321 | North Carolina |
| 1,754 | 820 | - | 1 | 2 | 1 | 61 | 32 | North Dakota |
| 25,455 | 11,553 | 1,966 | 3,518 | 89 | 92 | 470 | 274 | Ohio |
| 6,721 | 3,268 | 311 | 589 | 48 | 58 | 1,171 | 620 | Oklahoma |
| 7,993 | 3,979 | 64 | 135 | 65 | 74 | 511 | 302 | Oregon |
| 33,947 | 15,110 | 2,040 | 3,334 | 154 | 154 | 688 | 442 | Pennsylvania |
| 3,017 | 1,317 | 52 | 110 | 35 | 29 | 81 | 50 | Rhode Island |
| 6,597 | 3,033 | 1,773 | 2,954 | 29 | 35 | 145 | 73 | South Carolina |
| 1,989 | 952 | 2 | 10 | 2 | 3 | 127 | 60 | South Dakota |
| 10,851 | 4,849 | 1,239 | 2,082 | 37 | 42 | 180 | 103 | Tennessee |
| 26,169 | 12,656 | 2,881 | 5,236 | 3,043 | 2,931 | 1,654 | 1,065 | Texas |
| 3,132 | 1,694 | 11 | 35 | 57 | 60 | 188 | 131 | Utah |
| 1,412 | 689 | 1 | 9 | 2 | 2 | 18 | 9 | Vermont |
| 11,815 | 5,523 | 2,055 | 3,655 | 109 | 104 | 836 | 498 | Virginia |
| 11,827 | 5,878 | 182 | 439 | 109 | 125 | 1,602 | 919 | Washington |
| 4,454 | 2,085 | 118 | 187 | 9 | 9 | 49 | 31 | West Virginia |
| 12,865 | 5,932 | 265 | 504 | 55 | 63 | 303 | 160 | Wisconsin |
| 943 | 492 | 2 | 10 | 14 | 16 | 32 | 18 | Wyoming |

Estimated Prevalence Rates of Vision Impairment and Blindness for Persons Age 40 and Older by State



The map above reflects estimated state-by-state prevalence rates of vision impairment, including blindness. The overall national rate is 2.80%. When this rate is applied to the total U.S. population age 40 and older of approximately 130 million, the result indicates that more than 3.6 million older Americans are blind or visually impaired. Eighteen states and the District of Columbia have rates above the national average, while 32 states have rates at or below the average. Hawaii and Rhode Island have the highest rates at 6.83% and 3.27% respectively. Alaska has the lowest rate at 1.77%. The largest majority of states (36 states and DC) are within the 2.5% to 3.5% range. Differences between states are likely due to demographic differences in age, race and/or gender distribution.

| State | Rate |
|----------------------|--------|
| Total U.S. | 0.0280 |
| Alabama | 0.0256 |
| Alaska | 0.0177 |
| Arizona | 0.0282 |
| Arkansas | 0.0270 |
| California | 0.0304 |
| Colorado | 0.0229 |
| Connecticut | 0.0303 |
| Delaware | 0.0264 |
| District of Columbia | 0.0300 |
| Florida | 0.0323 |
| Georgia | 0.0218 |
| Hawaii | 0.0683 |
| Idaho | 0.0255 |
| Illinois | 0.0280 |
| Indiana | 0.0268 |
| Iowa | 0.0313 |
| Kansas | 0.0295 |
| Kentucky | 0.0244 |
| Louisiana | 0.0253 |
| Maine | 0.0263 |
| Maryland | 0.0260 |
| Massachusetts | 0.0302 |
| Michigan | 0.0270 |
| Minnesota | 0.0273 |
| Mississippi | 0.0252 |
| Missouri | 0.0274 |
| Montana | 0.0262 |
| Nebraska | 0.0294 |
| Nevada | 0.0233 |
| New Hampshire | 0.0242 |
| New Jersey | 0.0293 |
| New Mexico | 0.0273 |
| New York | 0.0297 |
| North Carolina | 0.0254 |
| North Dakota | 0.0316 |
| Ohio | 0.0280 |
| Oklahoma | 0.0283 |
| Oregon | 0.0285 |
| Pennsylvania | 0.0319 |
| Rhode Island | 0.0327 |
| South Carolina | 0.0249 |
| South Dakota | 0.0316 |
| Tennessee | 0.0245 |
| Texas | 0.0237 |
| Utah | 0.0243 |
| Vermont | 0.0245 |
| Virginia | 0.0244 |
| Washington | 0.0269 |
| West Virginia | 0.0270 |
| Wisconsin | 0.0279 |
| Wyoming | 0.0231 |

| State | Rate |
|----------------------|--------|
| Alaska | 0.0177 |
| Georgia | 0.0218 |
| Colorado | 0.0229 |
| Wyoming | 0.0231 |
| Nevada | 0.0233 |
| Texas | 0.0237 |
| New Hampshire | 0.0242 |
| Utah | 0.0243 |
| Kentucky | 0.0244 |
| Virginia | 0.0244 |
| Tennessee | 0.0245 |
| Vermont | 0.0245 |
| South Carolina | 0.0249 |
| Mississippi | 0.0252 |
| Louisiana | 0.0253 |
| North Carolina | 0.0254 |
| Idaho | 0.0255 |
| Alabama | 0.0256 |
| Maryland | 0.0260 |
| Montana | 0.0262 |
| Maine | 0.0263 |
| Delaware | 0.0264 |
| Indiana | 0.0268 |
| Washington | 0.0269 |
| Arkansas | 0.0270 |
| Michigan | 0.0270 |
| West Virginia | 0.0270 |
| Minnesota | 0.0273 |
| New Mexico | 0.0273 |
| Missouri | 0.0274 |
| Wisconsin | 0.0279 |
| Illinois | 0.0280 |
| Ohio | 0.0280 |
| Arizona | 0.0282 |
| Oklahoma | 0.0283 |
| Oregon | 0.0285 |
| New Jersey | 0.0293 |
| Nebraska | 0.0294 |
| Kansas | 0.0295 |
| New York | 0.0297 |
| District of Columbia | 0.0300 |
| Massachusetts | 0.0302 |
| Connecticut | 0.0303 |
| California | 0.0304 |
| Iowa | 0.0313 |
| North Dakota | 0.0316 |
| South Dakota | 0.0316 |
| Pennsylvania | 0.0319 |
| Florida | 0.0323 |
| Rhode Island | 0.0327 |
| Hawaii | 0.0683 |

Refractive Error

Refractive errors are the most frequent eye problems in the United States. They are optical defects that result in light not being properly focused on the eye's retina.

Nearsightedness (myopia) and farsightedness (hyperopia) are the most common refractive errors. People with myopia see near objects clearly, while distant ones are blurred. People with hyperopia experience just the opposite—distant objects are clear while near ones are blurred.

Why refractive errors develop is uncertain. Most infants have some degree of hyperopia, but vision becomes more normal with age, usually leveling off by age 6. However, some children remain farsighted or become so later in life. While some children may be nearsighted early in life, most myopia occurs later during adolescence. Refractive error can continue to change over our lifetime.

Other common refractive errors include astigmatism (uneven focus) and presbyopia (age-related problem with near focus). Fortunately, almost all refractive errors can be corrected by eyeglasses or contact lenses. It is estimated that more than 150 million Americans use corrective eyewear to compensate for their refractive error. Americans are estimated to spend over \$15 billion each year on eyewear, supporting an optical industry in the U.S. worth more than \$30 billion.

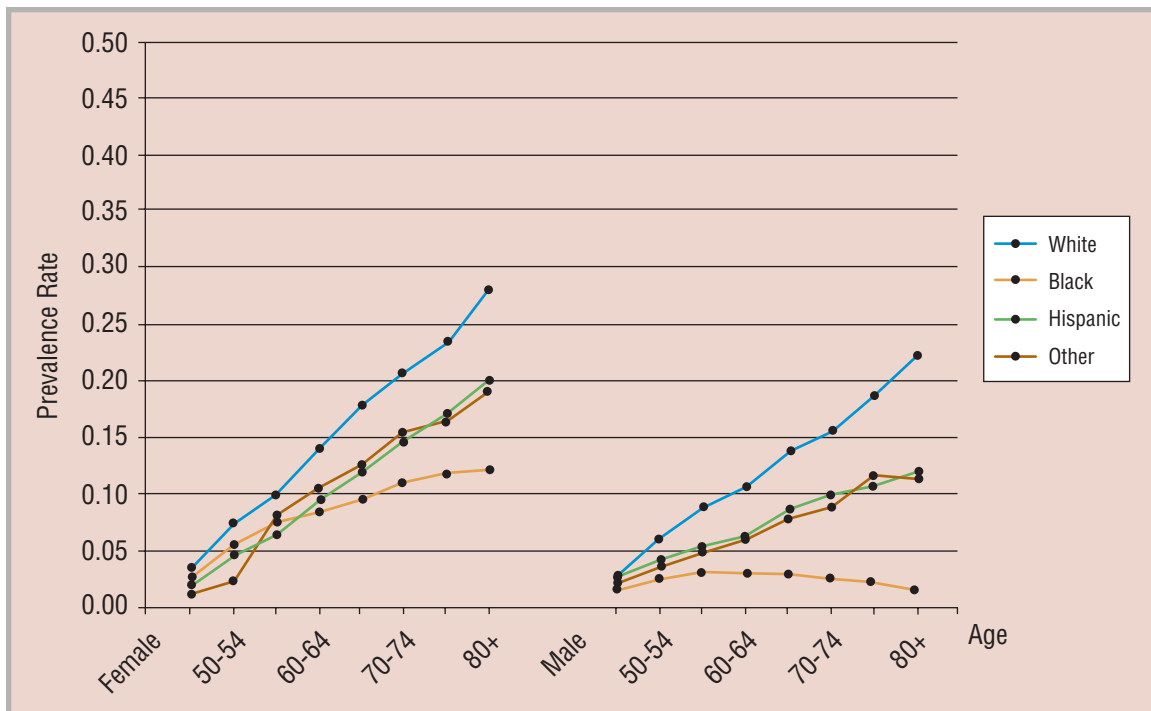
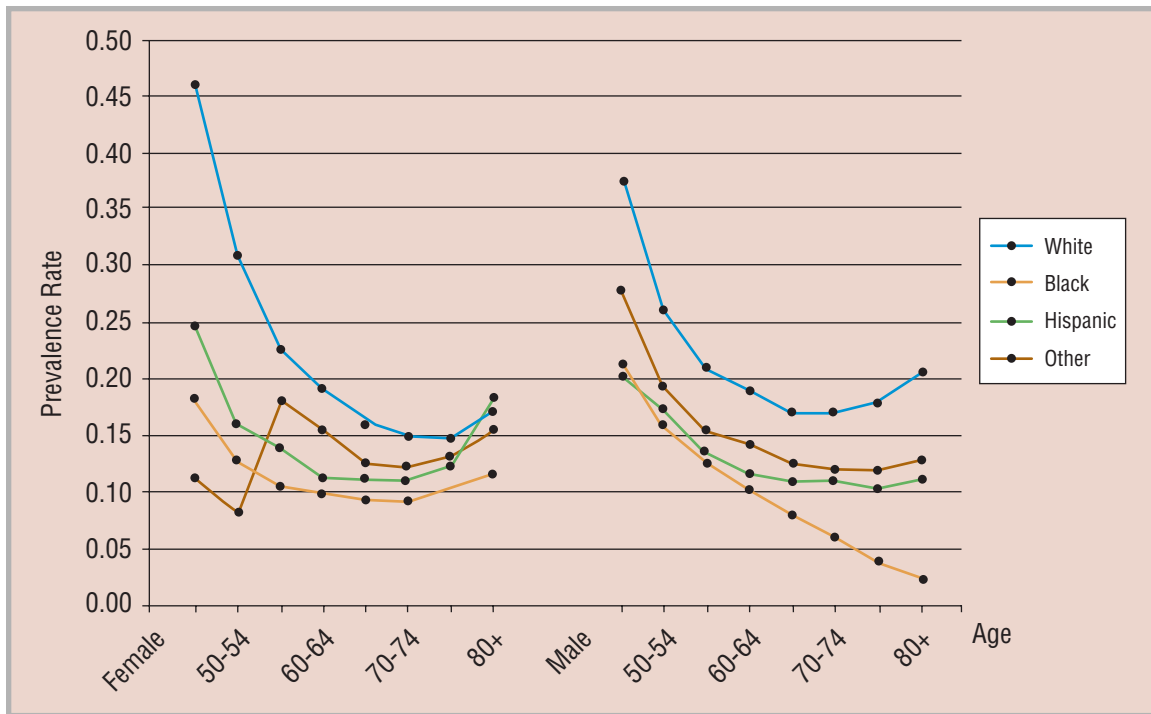
Refractive surgery is now another alternative for correcting problems such as myopia, hyperopia and astigmatism. The number of people seeking refractive surgery is increasing. However, the surgical procedures are not without some risk and the long-term effects of many of these procedures are still unknown.

Uncorrected or under-corrected refractive error can result in significant vision impairment. The magnitude of refractive error is measured in units called diopters. For each diopter of refractive error, a person may be unable to read the next smaller line of an eye chart. For instance, a person with more than two diopters of hyperopia might find it difficult to read this text.

Cases of refractive error described in the following charts include myopia of 1.0 diopters or more. The threshold for clinically significant hyperopia is somewhat higher at 3.0 diopters or more.

Myopia is a very common disorder affecting more than 32 million Americans age 40 and older. Prevalence is greater in women through age 60 when rates become more comparable between genders (see chart below). Myopia affects more Whites than other races, and is generally less frequent with age. Because of the higher threshold for significance, hyperopia is less common, affecting over 12 million older Americans. Prevalence of hyperopia generally increases with age (see chart below). It is most frequent in Whites, but also affects Hispanics more often than Blacks.

Estimated Specific Prevalence Rates for Myopia and Hyperopia



Estimated Number of Cases of Myopia (≥ 1.00 diopters or worse) in the U.S. Population Age 40 and Older by State, Race and Sex

| State | Total | Female | Male | White | Black | Hispanic | Other |
|----------------------|------------|------------|------------|------------|-----------|-----------|---------|
| Total U.S. | 32,608,376 | 17,652,359 | 14,956,017 | 27,532,387 | 2,008,214 | 2,079,427 | 988,348 |
| Alabama | 505,517 | 275,958 | 229,559 | 430,565 | 66,677 | 4,177 | 4,098 |
| Alaska | 72,139 | 36,393 | 35,746 | 61,407 | 1,193 | 1,472 | 8,067 |
| Arizona | 591,950 | 317,168 | 274,782 | 490,430 | 9,846 | 71,122 | 20,553 |
| Arkansas | 317,674 | 173,015 | 144,659 | 287,382 | 22,817 | 4,627 | 2,849 |
| California | 3,438,248 | 1,814,445 | 1,623,803 | 2,370,236 | 136,520 | 606,101 | 325,391 |
| Colorado | 512,365 | 276,035 | 236,330 | 452,079 | 9,863 | 41,284 | 9,138 |
| Connecticut | 439,011 | 241,622 | 197,389 | 394,890 | 18,035 | 19,059 | 7,027 |
| Delaware | 95,500 | 51,912 | 43,587 | 82,640 | 9,385 | 1,948 | 1,526 |
| District of Columbia | 42,976 | 22,742 | 20,234 | 18,949 | 20,555 | 2,473 | 998 |
| Florida | 2,002,312 | 1,081,022 | 921,290 | 1,615,201 | 136,585 | 221,996 | 28,530 |
| Georgia | 870,225 | 469,242 | 400,982 | 698,544 | 135,009 | 21,474 | 15,197 |
| Hawaii | 115,585 | 55,393 | 60,192 | 47,352 | 1,239 | 4,481 | 62,512 |
| Idaho | 161,387 | 86,730 | 74,657 | 154,105 | 300 | 4,968 | 2,014 |
| Illinois | 1,378,992 | 750,157 | 628,835 | 1,163,275 | 103,288 | 78,836 | 33,592 |
| Indiana | 736,788 | 402,747 | 334,041 | 691,603 | 28,608 | 11,240 | 5,336 |
| Iowa | 379,414 | 206,910 | 172,504 | 369,599 | 3,131 | 4,097 | 2,587 |
| Kansas | 324,246 | 176,096 | 148,150 | 301,901 | 8,468 | 9,150 | 4,727 |
| Kentucky | 511,413 | 281,473 | 229,940 | 487,930 | 17,279 | 3,292 | 2,913 |
| Louisiana | 465,249 | 252,691 | 212,558 | 373,070 | 78,711 | 7,791 | 5,676 |
| Maine | 186,587 | 102,607 | 83,980 | 184,349 | 435 | 651 | 1,152 |
| Maryland | 601,752 | 326,642 | 275,110 | 472,990 | 94,657 | 15,059 | 19,047 |
| Massachusetts | 791,817 | 436,899 | 354,918 | 731,395 | 20,336 | 23,236 | 16,850 |
| Michigan | 1,190,884 | 646,534 | 544,350 | 1,079,221 | 78,457 | 16,904 | 16,303 |
| Minnesota | 631,915 | 341,034 | 290,881 | 605,671 | 8,939 | 6,713 | 10,592 |
| Mississippi | 292,561 | 159,141 | 133,420 | 232,427 | 55,650 | 2,422 | 2,063 |
| Missouri | 695,285 | 380,339 | 314,946 | 646,180 | 35,774 | 6,767 | 6,564 |
| Montana | 124,378 | 66,766 | 57,612 | 119,512 | 169 | 1,118 | 3,578 |
| Nebraska | 210,209 | 114,285 | 95,924 | 199,877 | 3,602 | 4,663 | 2,068 |
| Nevada | 245,124 | 126,487 | 118,637 | 201,673 | 9,150 | 22,699 | 11,603 |
| New Hampshire | 177,549 | 96,715 | 80,834 | 174,200 | 597 | 1,294 | 1,458 |
| New Jersey | 993,452 | 540,920 | 452,532 | 810,526 | 66,796 | 75,181 | 40,949 |
| New Mexico | 193,573 | 104,499 | 89,073 | 127,580 | 2,133 | 52,831 | 11,028 |
| New York | 2,101,397 | 1,147,008 | 954,388 | 1,657,410 | 171,404 | 182,681 | 89,902 |
| North Carolina | 924,549 | 504,299 | 420,250 | 788,960 | 103,593 | 17,294 | 14,703 |
| North Dakota | 81,554 | 43,824 | 37,730 | 79,270 | 157 | 360 | 1,767 |
| Ohio | 1,395,794 | 766,153 | 629,641 | 1,295,715 | 75,922 | 12,348 | 11,809 |
| Oklahoma | 404,187 | 218,053 | 186,134 | 359,681 | 14,337 | 9,124 | 21,045 |
| Oregon | 438,169 | 236,951 | 201,218 | 411,170 | 3,415 | 12,565 | 11,020 |
| Pennsylvania | 1,575,622 | 865,361 | 710,261 | 1,463,495 | 71,825 | 23,007 | 17,296 |
| Rhode Island | 134,456 | 74,641 | 59,815 | 124,672 | 2,780 | 5,185 | 1,820 |
| South Carolina | 453,014 | 246,929 | 206,084 | 374,319 | 69,595 | 5,258 | 3,842 |
| South Dakota | 95,071 | 50,849 | 44,223 | 91,133 | 247 | 608 | 3,083 |
| Tennessee | 692,533 | 379,230 | 313,303 | 626,735 | 53,582 | 6,706 | 5,511 |
| Texas | 2,129,114 | 1,144,850 | 984,264 | 1,547,745 | 138,996 | 391,945 | 50,427 |
| Utah | 218,186 | 117,254 | 100,932 | 203,312 | 859 | 9,595 | 4,419 |
| Vermont | 87,758 | 48,122 | 39,636 | 86,639 | 205 | 386 | 528 |
| Virginia | 837,108 | 453,672 | 383,436 | 708,291 | 86,198 | 19,767 | 22,852 |
| Washington | 739,909 | 396,207 | 343,702 | 673,657 | 11,966 | 21,117 | 33,168 |
| West Virginia | 244,902 | 134,343 | 110,559 | 239,313 | 3,685 | 883 | 1,022 |
| Wisconsin | 692,795 | 374,524 | 318,271 | 660,853 | 15,041 | 9,593 | 7,308 |
| Wyoming | 66,183 | 35,468 | 30,715 | 63,260 | 205 | 1,882 | 837 |

| White Female | White Male | Black Female | Black Male | Hisp. Female | Hisp. Male | Other Female | Other Male | State |
|--------------|------------|--------------|------------|--------------|------------|--------------|------------|----------------------|
| 15,068,869 | 12,463,518 | 1,057,451 | 950,763 | 1,114,406 | 965,021 | 411,633 | 576,715 | Total U.S. |
| 236,121 | 194,444 | 36,078 | 30,599 | 2,035 | 2,142 | 1,723 | 2,375 | Alabama |
| 31,830 | 29,577 | 528 | 665 | 757 | 715 | 3,278 | 4,788 | Alaska |
| 266,174 | 224,256 | 4,499 | 5,346 | 37,656 | 33,466 | 8,839 | 11,714 | Arizona |
| 157,478 | 129,903 | 12,130 | 10,687 | 2,222 | 2,405 | 1,185 | 1,663 | Arkansas |
| 1,280,662 | 1,089,574 | 68,712 | 67,808 | 326,208 | 279,892 | 138,862 | 186,529 | California |
| 246,136 | 205,943 | 4,449 | 5,414 | 21,597 | 19,687 | 3,853 | 5,285 | Colorado |
| 218,705 | 176,185 | 9,605 | 8,430 | 10,633 | 8,426 | 2,679 | 4,348 | Connecticut |
| 45,362 | 37,278 | 4,939 | 4,446 | 987 | 960 | 624 | 903 | Delaware |
| 9,565 | 9,384 | 11,424 | 9,131 | 1,306 | 1,167 | 447 | 551 | District of Columbia |
| 875,683 | 739,518 | 70,522 | 66,063 | 122,668 | 99,328 | 12,149 | 16,381 | Florida |
| 382,358 | 316,186 | 71,021 | 63,989 | 9,888 | 11,586 | 5,976 | 9,222 | Georgia |
| 24,380 | 22,972 | 443 | 796 | 2,457 | 2,025 | 28,113 | 34,399 | Hawaii |
| 83,326 | 70,779 | 108 | 193 | 2,442 | 2,525 | 854 | 1,160 | Idaho |
| 640,138 | 523,137 | 56,076 | 47,212 | 40,152 | 38,683 | 13,790 | 19,802 | Illinois |
| 380,003 | 311,600 | 15,031 | 13,576 | 5,573 | 5,667 | 2,140 | 3,197 | Indiana |
| 202,385 | 167,214 | 1,444 | 1,687 | 2,026 | 2,071 | 1,055 | 1,532 | Iowa |
| 165,401 | 136,499 | 4,188 | 4,280 | 4,595 | 4,555 | 1,912 | 2,815 | Kansas |
| 269,853 | 218,077 | 8,925 | 8,354 | 1,539 | 1,753 | 1,157 | 1,755 | Kentucky |
| 204,229 | 168,841 | 42,049 | 36,662 | 4,168 | 3,623 | 2,245 | 3,431 | Louisiana |
| 101,609 | 82,740 | 163 | 272 | 352 | 298 | 482 | 671 | Maine |
| 260,124 | 212,866 | 50,475 | 44,182 | 8,143 | 6,916 | 7,901 | 11,146 | Maryland |
| 406,917 | 324,477 | 10,356 | 9,980 | 13,104 | 10,132 | 6,521 | 10,328 | Massachusetts |
| 589,587 | 489,633 | 41,896 | 36,561 | 8,690 | 8,213 | 6,360 | 9,943 | Michigan |
| 329,709 | 275,962 | 3,916 | 5,023 | 3,251 | 3,462 | 4,158 | 6,434 | Minnesota |
| 127,365 | 105,062 | 29,748 | 25,902 | 1,146 | 1,276 | 882 | 1,180 | Mississippi |
| 354,909 | 291,271 | 19,205 | 16,569 | 3,503 | 3,264 | 2,722 | 3,843 | Missouri |
| 64,615 | 54,897 | 59 | 110 | 616 | 502 | 1,475 | 2,103 | Montana |
| 109,333 | 90,543 | 1,785 | 1,817 | 2,288 | 2,374 | 878 | 1,190 | Nebraska |
| 105,441 | 96,231 | 4,377 | 4,773 | 11,490 | 11,209 | 5,179 | 6,424 | Nevada |
| 95,197 | 79,003 | 243 | 354 | 704 | 590 | 571 | 887 | New Hampshire |
| 448,116 | 362,410 | 35,761 | 31,035 | 41,068 | 34,113 | 15,974 | 24,975 | New Jersey |
| 69,973 | 57,607 | 932 | 1,201 | 28,833 | 23,998 | 4,761 | 6,267 | New Mexico |
| 914,246 | 743,164 | 94,094 | 77,310 | 103,534 | 79,147 | 35,135 | 54,768 | New York |
| 435,095 | 353,865 | 55,323 | 48,270 | 7,821 | 9,473 | 6,061 | 8,642 | North Carolina |
| 42,842 | 36,428 | 51 | 106 | 192 | 168 | 739 | 1,028 | North Dakota |
| 714,381 | 581,333 | 40,455 | 35,467 | 6,523 | 5,825 | 4,793 | 7,016 | Ohio |
| 197,347 | 162,333 | 7,254 | 7,083 | 4,514 | 4,610 | 8,938 | 12,108 | Oklahoma |
| 224,767 | 186,402 | 1,495 | 1,920 | 6,087 | 6,478 | 4,601 | 6,419 | Oregon |
| 807,326 | 656,169 | 38,785 | 33,040 | 12,335 | 10,672 | 6,916 | 10,380 | Pennsylvania |
| 69,633 | 55,039 | 1,346 | 1,434 | 2,943 | 2,242 | 719 | 1,101 | Rhode Island |
| 205,492 | 168,828 | 37,338 | 32,256 | 2,457 | 2,801 | 1,643 | 2,199 | South Carolina |
| 49,193 | 41,940 | 74 | 173 | 304 | 304 | 1,278 | 1,805 | South Dakota |
| 345,318 | 281,417 | 28,565 | 25,016 | 3,117 | 3,589 | 2,230 | 3,281 | Tennessee |
| 843,518 | 704,227 | 71,223 | 67,774 | 210,125 | 181,820 | 19,984 | 30,444 | Texas |
| 110,247 | 93,065 | 318 | 541 | 4,877 | 4,717 | 1,811 | 2,608 | Utah |
| 47,611 | 39,029 | 82 | 122 | 209 | 177 | 220 | 308 | Vermont |
| 388,435 | 319,856 | 45,083 | 41,115 | 10,469 | 9,298 | 9,685 | 13,168 | Virginia |
| 366,064 | 307,593 | 5,119 | 6,847 | 10,609 | 10,508 | 14,414 | 18,754 | Washington |
| 131,583 | 107,730 | 1,872 | 1,812 | 460 | 423 | 428 | 594 | West Virginia |
| 359,036 | 301,817 | 7,804 | 7,236 | 4,751 | 4,842 | 2,932 | 4,376 | Wisconsin |
| 34,046 | 29,214 | 82 | 123 | 979 | 903 | 361 | 476 | Wyoming |

Estimated Number of Cases of Hyperopia (≥ 3.00 diopters or worse) in the U.S. Population Age 40 and Older by State, Race and Sex

| State | Total | Female | Male | White | Black | Hispanic | Other |
|----------------------|------------|-----------|-----------|------------|---------|----------|---------|
| Total U.S. | 12,703,454 | 7,670,199 | 5,033,255 | 10,937,951 | 673,322 | 719,458 | 372,723 |
| Alabama | 199,887 | 123,605 | 76,282 | 173,697 | 23,401 | 1,380 | 1,409 |
| Alaska | 20,607 | 11,043 | 9,563 | 17,060 | 303 | 403 | 2,841 |
| Arizona | 247,411 | 145,198 | 102,213 | 212,959 | 2,937 | 23,928 | 7,587 |
| Arkansas | 130,020 | 78,900 | 51,121 | 119,856 | 7,795 | 1,372 | 997 |
| California | 1,322,770 | 786,575 | 536,195 | 944,129 | 44,613 | 203,756 | 130,272 |
| Colorado | 177,298 | 103,586 | 73,712 | 157,028 | 2,878 | 14,188 | 3,204 |
| Connecticut | 172,010 | 105,071 | 66,939 | 157,678 | 5,979 | 6,071 | 2,281 |
| Delaware | 37,614 | 22,762 | 14,852 | 33,441 | 3,029 | 603 | 542 |
| District of Columbia | 16,905 | 11,375 | 5,530 | 7,408 | 8,257 | 838 | 401 |
| Florida | 908,946 | 546,296 | 362,650 | 763,370 | 44,326 | 90,920 | 10,330 |
| Georgia | 308,334 | 188,645 | 119,689 | 255,059 | 42,380 | 6,026 | 4,869 |
| Hawaii | 49,355 | 29,301 | 20,054 | 17,370 | 290 | 1,488 | 30,207 |
| Idaho | 60,384 | 34,866 | 25,518 | 58,116 | 72 | 1,456 | 741 |
| Illinois | 532,099 | 325,586 | 206,513 | 458,797 | 35,997 | 24,881 | 12,424 |
| Indiana | 281,099 | 170,334 | 110,765 | 266,038 | 9,693 | 3,584 | 1,785 |
| Iowa | 154,174 | 92,862 | 61,311 | 151,156 | 936 | 1,230 | 851 |
| Kansas | 126,932 | 76,022 | 50,910 | 119,700 | 2,709 | 2,917 | 1,607 |
| Kentucky | 192,612 | 116,277 | 76,335 | 184,872 | 5,740 | 1,039 | 961 |
| Louisiana | 176,930 | 109,761 | 67,169 | 144,991 | 26,899 | 3,033 | 2,006 |
| Maine | 71,490 | 42,443 | 29,047 | 70,790 | 109 | 216 | 375 |
| Maryland | 223,414 | 137,460 | 85,954 | 180,931 | 30,831 | 4,724 | 6,928 |
| Massachusetts | 309,967 | 189,215 | 120,752 | 290,444 | 6,495 | 7,236 | 5,792 |
| Michigan | 450,243 | 272,218 | 178,025 | 412,162 | 26,986 | 5,621 | 5,474 |
| Minnesota | 232,938 | 137,768 | 95,170 | 225,335 | 2,236 | 1,902 | 3,465 |
| Mississippi | 114,690 | 71,730 | 42,960 | 94,285 | 18,839 | 829 | 736 |
| Missouri | 271,441 | 164,461 | 106,980 | 254,638 | 12,206 | 2,242 | 2,354 |
| Montana | 47,597 | 27,486 | 20,111 | 45,949 | 45 | 372 | 1,231 |
| Nebraska | 83,166 | 49,814 | 33,352 | 79,928 | 1,126 | 1,394 | 718 |
| Nevada | 93,718 | 53,144 | 40,574 | 79,080 | 2,952 | 7,129 | 4,557 |
| New Hampshire | 62,632 | 36,676 | 25,956 | 61,618 | 154 | 391 | 469 |
| New Jersey | 391,019 | 239,886 | 151,133 | 328,539 | 22,907 | 25,672 | 13,901 |
| New Mexico | 77,836 | 45,980 | 31,856 | 52,498 | 666 | 20,625 | 4,048 |
| New York | 844,410 | 521,465 | 322,945 | 684,154 | 60,995 | 66,951 | 32,311 |
| North Carolina | 356,396 | 218,994 | 137,402 | 311,019 | 35,626 | 4,668 | 5,083 |
| North Dakota | 33,102 | 19,677 | 13,424 | 32,370 | 31 | 117 | 584 |
| Ohio | 541,969 | 330,788 | 211,181 | 507,147 | 26,516 | 4,188 | 4,118 |
| Oklahoma | 161,907 | 97,031 | 64,876 | 146,344 | 4,634 | 2,759 | 8,170 |
| Oregon | 171,292 | 100,812 | 70,480 | 162,619 | 1,006 | 3,675 | 3,992 |
| Pennsylvania | 652,326 | 400,458 | 251,868 | 613,065 | 25,698 | 7,479 | 6,084 |
| Rhode Island | 54,213 | 33,313 | 20,900 | 51,128 | 840 | 1,607 | 637 |
| South Carolina | 176,356 | 108,915 | 67,441 | 149,258 | 24,163 | 1,596 | 1,339 |
| South Dakota | 38,500 | 22,782 | 15,718 | 37,194 | 55 | 196 | 1,056 |
| Tennessee | 265,048 | 161,233 | 103,815 | 243,527 | 17,684 | 2,005 | 1,832 |
| Texas | 786,618 | 469,514 | 317,105 | 588,039 | 43,998 | 137,686 | 16,895 |
| Utah | 78,520 | 45,464 | 33,056 | 73,792 | 217 | 2,965 | 1,546 |
| Vermont | 32,116 | 18,845 | 13,271 | 31,747 | 52 | 144 | 174 |
| Virginia | 307,137 | 185,937 | 121,200 | 264,570 | 28,760 | 5,788 | 8,019 |
| Washington | 270,756 | 158,266 | 112,490 | 248,931 | 3,255 | 6,211 | 12,359 |
| West Virginia | 99,572 | 59,625 | 39,948 | 97,476 | 1,343 | 357 | 397 |
| Wisconsin | 263,629 | 156,967 | 106,662 | 253,626 | 4,603 | 2,932 | 2,467 |
| Wyoming | 24,052 | 13,769 | 10,283 | 23,027 | 60 | 668 | 296 |

| White Female | White Male | Black Female | Black Male | Hisp. Female | Hisp. Male | Other Female | Other Male | State |
|--------------|------------|--------------|------------|--------------|------------|--------------|------------|----------------------|
| 6,532,088 | 4,405,862 | 501,824 | 171,497 | 422,199 | 297,259 | 214,087 | 158,636 | Total U.S. |
| 104,315 | 69,382 | 17,741 | 5,660 | 750 | 630 | 799 | 610 | Alabama |
| 9,028 | 8,032 | 196 | 107 | 217 | 186 | 1,603 | 1,238 | Alaska |
| 124,960 | 87,998 | 2,016 | 921 | 13,759 | 10,169 | 4,463 | 3,124 | Arizona |
| 71,766 | 48,090 | 5,855 | 1,940 | 714 | 658 | 564 | 433 | Arkansas |
| 558,370 | 385,759 | 32,472 | 12,140 | 119,489 | 84,266 | 76,243 | 54,029 | California |
| 91,675 | 65,353 | 1,964 | 914 | 8,087 | 6,101 | 1,860 | 1,345 | Colorado |
| 95,765 | 61,913 | 4,469 | 1,510 | 3,618 | 2,453 | 1,219 | 1,062 | Connecticut |
| 19,896 | 13,545 | 2,232 | 797 | 331 | 271 | 303 | 239 | Delaware |
| 4,190 | 3,218 | 6,436 | 1,822 | 505 | 333 | 244 | 157 | District of Columbia |
| 452,239 | 311,130 | 32,482 | 11,844 | 55,658 | 35,262 | 5,916 | 4,414 | Florida |
| 151,606 | 103,453 | 31,359 | 11,022 | 3,066 | 2,961 | 2,615 | 2,254 | Georgia |
| 9,632 | 7,738 | 166 | 125 | 874 | 614 | 18,629 | 11,578 | Hawaii |
| 33,642 | 24,473 | 41 | 30 | 756 | 700 | 427 | 314 | Idaho |
| 277,643 | 181,155 | 27,257 | 8,740 | 13,684 | 11,197 | 7,002 | 5,422 | Illinois |
| 160,204 | 105,834 | 7,217 | 2,476 | 1,927 | 1,657 | 987 | 798 | Indiana |
| 91,081 | 60,075 | 649 | 288 | 659 | 572 | 474 | 377 | Iowa |
| 71,570 | 48,130 | 1,962 | 747 | 1,600 | 1,317 | 890 | 717 | Kansas |
| 110,947 | 73,925 | 4,250 | 1,490 | 546 | 494 | 534 | 427 | Kentucky |
| 86,681 | 58,310 | 20,152 | 6,747 | 1,839 | 1,194 | 1,089 | 917 | Louisiana |
| 42,036 | 28,754 | 66 | 43 | 128 | 88 | 213 | 161 | Maine |
| 107,885 | 73,047 | 22,890 | 7,940 | 2,807 | 1,917 | 3,878 | 3,050 | Maryland |
| 176,970 | 113,473 | 4,759 | 1,736 | 4,336 | 2,901 | 3,150 | 2,642 | Massachusetts |
| 245,874 | 166,288 | 20,237 | 6,749 | 3,125 | 2,496 | 2,983 | 2,492 | Michigan |
| 133,396 | 91,939 | 1,471 | 765 | 993 | 909 | 1,909 | 1,556 | Minnesota |
| 56,726 | 37,559 | 14,128 | 4,710 | 450 | 380 | 426 | 311 | Mississippi |
| 152,648 | 101,990 | 9,208 | 2,998 | 1,266 | 976 | 1,338 | 1,016 | Missouri |
| 26,540 | 19,409 | 27 | 18 | 218 | 153 | 701 | 530 | Montana |
| 47,860 | 32,068 | 810 | 317 | 729 | 665 | 415 | 303 | Nebraska |
| 44,428 | 34,652 | 2,077 | 875 | 3,918 | 3,211 | 2,722 | 1,836 | Nevada |
| 36,098 | 25,520 | 97 | 57 | 227 | 164 | 254 | 215 | New Hampshire |
| 199,806 | 128,733 | 17,247 | 5,661 | 15,270 | 10,402 | 7,564 | 6,338 | New Jersey |
| 30,895 | 21,602 | 451 | 215 | 12,242 | 8,383 | 2,392 | 1,656 | New Mexico |
| 415,283 | 268,871 | 46,752 | 14,242 | 41,687 | 25,264 | 17,743 | 14,569 | New York |
| 186,998 | 124,021 | 26,805 | 8,820 | 2,298 | 2,370 | 2,892 | 2,191 | North Carolina |
| 19,257 | 13,113 | 16 | 15 | 67 | 50 | 338 | 246 | North Dakota |
| 306,132 | 201,014 | 19,965 | 6,550 | 2,391 | 1,797 | 2,299 | 1,819 | Ohio |
| 87,404 | 58,941 | 3,377 | 1,257 | 1,470 | 1,289 | 4,780 | 3,390 | Oklahoma |
| 95,914 | 66,705 | 678 | 329 | 1,938 | 1,737 | 2,283 | 1,709 | Oregon |
| 373,213 | 239,851 | 19,606 | 6,092 | 4,291 | 3,188 | 3,347 | 2,737 | Pennsylvania |
| 31,394 | 19,734 | 596 | 244 | 974 | 633 | 349 | 289 | Rhode Island |
| 89,130 | 60,128 | 18,176 | 5,987 | 835 | 761 | 774 | 565 | South Carolina |
| 22,033 | 15,160 | 29 | 26 | 109 | 87 | 612 | 444 | South Dakota |
| 145,953 | 97,574 | 13,229 | 4,454 | 1,041 | 964 | 1,009 | 823 | Tennessee |
| 347,295 | 240,744 | 32,193 | 11,805 | 80,802 | 56,884 | 9,223 | 7,671 | Texas |
| 42,823 | 30,969 | 131 | 86 | 1,639 | 1,327 | 872 | 674 | Utah |
| 18,635 | 13,111 | 31 | 20 | 85 | 59 | 93 | 80 | Vermont |
| 156,705 | 107,864 | 21,332 | 7,428 | 3,322 | 2,467 | 4,578 | 3,441 | Virginia |
| 145,520 | 103,411 | 2,128 | 1,127 | 3,315 | 2,896 | 7,304 | 5,055 | Washington |
| 58,189 | 39,286 | 1,005 | 337 | 208 | 149 | 222 | 175 | West Virginia |
| 150,654 | 102,972 | 3,354 | 1,249 | 1,566 | 1,366 | 1,392 | 1,075 | Wisconsin |
| 13,184 | 9,843 | 39 | 22 | 374 | 295 | 173 | 124 | Wyoming |

Age-related Macular Degeneration

Age-related macular degeneration (AMD) is a condition that primarily affects the part of the retina responsible for sharp central vision. There are two forms:

1. **Dry AMD (non-exudative)** is the most common form of the disease. Early AMD involves the presence of drusen, fatty deposits under the light-sensing cells in the retina. Late cases of dry AMD may also involve atrophy of the supportive layer under the light-sensing cells in the retina that helps keep those cells healthy. Vision loss in early dry AMD is usually moderate and only slowly progressive. Atrophy in late cases of dry AMD can result in more significant vision loss.
2. **Wet AMD (exudative)** is less common, but is more threatening to vision. It's called wet AMD because of the growth of tiny new blood vessels (neovascularization) under the retina that leak fluid or break open. This distorts vision and causes scar tissue to form. All cases of the wet form are considered late AMD.

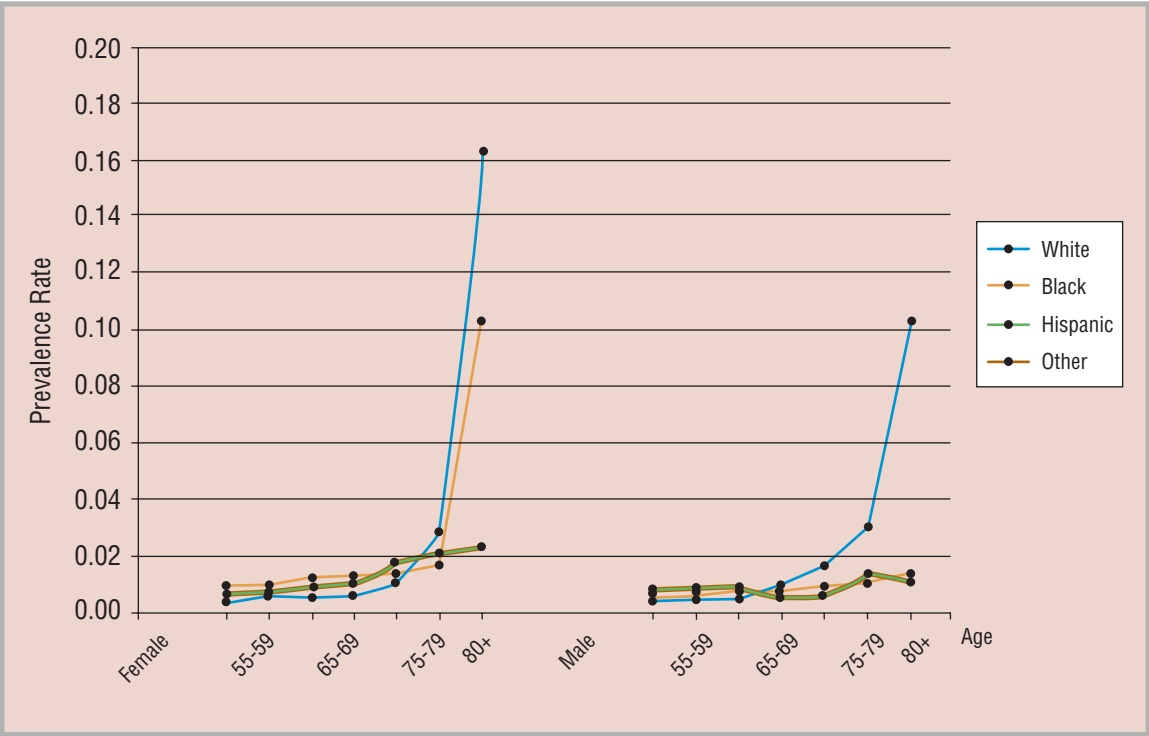
The exact cause of AMD is unknown, but risk factors for the disease include age (rarely affecting those under age 50), White race and cigarette smoking. Research also suggests that long-term diets low in certain antioxidant nutrients may increase the risk of AMD. Because AMD often damages central vision, it is likely the most common cause of legal blindness and vision impairment in older Americans.

Unfortunately, there is no generally-accepted treatment for dry AMD. Laser therapies to destroy leaking blood vessels can help reduce the risk of advancing vision loss in many cases of wet AMD. Research has recently shown that certain doses of zinc, vitamins A and C, and beta-carotene can help control the advance of late AMD, but appear to have no effect in preventing the disease in otherwise healthy individuals.

Only cases of late AMD involving geographic atrophy or neovascularization are included in the prevalence estimates on page 19. Over 2 million Americans age 50 and older have late AMD. Age-specific prevalence rates are initially comparable between races, but advance more significantly for Whites after age 75 (see chart on page 19). In Blacks, the disease is more prevalent in women until about age 75 as well.

Because data are lacking for Hispanics and other races, the rates shown below for these populations are an arithmetic average of the rates for Whites and Blacks.

Estimated Specific Prevalence Rates for AMD



Estimated Number of Cases of Age-related Macular Degeneration in the U.S. Population Age 50 and Older by State, Race and Sex

| State | Total | Female | Male | White | Black | Hispanic | Other |
|----------------------|-----------|-----------|---------|-----------|---------|----------|--------|
| Total U.S. | 2,074,761 | 1,367,365 | 707,396 | 1,864,742 | 125,164 | 53,523 | 31,331 |
| Alabama | 31,769 | 21,482 | 10,287 | 26,877 | 4,678 | 99 | 114 |
| Alaska | 1,994 | 1,153 | 841 | 1,696 | 39 | 26 | 232 |
| Arizona | 39,012 | 24,252 | 14,760 | 36,156 | 483 | 1,744 | 628 |
| Arkansas | 21,130 | 13,983 | 7,147 | 19,356 | 1,602 | 91 | 81 |
| California | 202,413 | 131,725 | 70,688 | 168,061 | 8,192 | 14,937 | 11,223 |
| Colorado | 25,208 | 16,079 | 9,129 | 23,434 | 462 | 1,051 | 262 |
| Connecticut | 31,393 | 21,038 | 10,355 | 29,728 | 1,054 | 432 | 179 |
| Delaware | 6,136 | 4,019 | 2,117 | 5,513 | 538 | 42 | 44 |
| District of Columbia | 3,264 | 2,485 | 779 | 1,235 | 1,932 | 62 | 35 |
| Florida | 160,481 | 101,723 | 58,758 | 144,711 | 7,580 | 7,341 | 849 |
| Georgia | 45,091 | 30,594 | 14,497 | 36,941 | 7,389 | 382 | 379 |
| Hawaii | 5,651 | 3,639 | 2,012 | 2,707 | 42 | 108 | 2,794 |
| Idaho | 9,407 | 5,869 | 3,539 | 9,240 | 9 | 96 | 62 |
| Illinois | 90,175 | 60,877 | 29,298 | 80,759 | 6,644 | 1,740 | 1,032 |
| Indiana | 46,313 | 30,807 | 15,506 | 44,076 | 1,840 | 253 | 143 |
| Iowa | 28,346 | 18,753 | 9,593 | 28,034 | 162 | 83 | 67 |
| Kansas | 22,430 | 14,733 | 7,696 | 21,592 | 503 | 206 | 129 |
| Kentucky | 29,330 | 19,321 | 10,009 | 28,069 | 1,113 | 72 | 76 |
| Louisiana | 28,308 | 19,199 | 9,109 | 22,870 | 5,035 | 240 | 164 |
| Maine | 11,498 | 7,382 | 4,116 | 11,435 | 18 | 16 | 30 |
| Maryland | 36,784 | 24,746 | 12,038 | 30,559 | 5,324 | 333 | 569 |
| Massachusetts | 55,321 | 37,101 | 18,219 | 53,196 | 1,149 | 508 | 467 |
| Michigan | 75,235 | 49,915 | 25,320 | 69,165 | 5,226 | 409 | 436 |
| Minnesota | 39,250 | 25,571 | 13,678 | 38,555 | 297 | 123 | 274 |
| Mississippi | 18,368 | 12,664 | 5,704 | 14,616 | 3,631 | 61 | 60 |
| Missouri | 45,172 | 29,844 | 15,329 | 42,524 | 2,293 | 162 | 193 |
| Montana | 7,501 | 4,687 | 2,814 | 7,367 | 8 | 27 | 99 |
| Nebraska | 14,625 | 9,554 | 5,071 | 14,283 | 190 | 94 | 58 |
| Nevada | 12,674 | 7,607 | 5,068 | 11,315 | 482 | 493 | 384 |
| New Hampshire | 9,667 | 6,168 | 3,498 | 9,582 | 21 | 27 | 37 |
| New Jersey | 67,657 | 45,463 | 22,194 | 60,498 | 4,158 | 1,894 | 1,107 |
| New Mexico | 10,580 | 6,692 | 3,888 | 8,490 | 119 | 1,635 | 336 |
| New York | 143,783 | 97,080 | 46,703 | 124,378 | 11,596 | 5,155 | 2,653 |
| North Carolina | 56,515 | 38,065 | 18,450 | 48,840 | 6,976 | 286 | 412 |
| North Dakota | 6,093 | 3,984 | 2,109 | 6,035 | 3 | 8 | 46 |
| Ohio | 92,504 | 61,672 | 30,831 | 86,686 | 5,175 | 309 | 334 |
| Oklahoma | 25,433 | 16,391 | 9,042 | 23,720 | 831 | 187 | 694 |
| Oregon | 28,737 | 18,357 | 10,380 | 27,982 | 180 | 244 | 331 |
| Pennsylvania | 121,472 | 81,714 | 39,758 | 115,099 | 5,340 | 537 | 495 |
| Rhode Island | 10,349 | 6,991 | 3,359 | 10,045 | 139 | 113 | 52 |
| South Carolina | 27,852 | 18,827 | 9,026 | 22,914 | 4,721 | 108 | 109 |
| South Dakota | 6,995 | 4,541 | 2,454 | 6,888 | 8 | 14 | 85 |
| Tennessee | 40,744 | 27,128 | 13,616 | 37,192 | 3,272 | 134 | 146 |
| Texas | 110,852 | 72,234 | 38,618 | 91,511 | 7,652 | 10,340 | 1,349 |
| Utah | 11,659 | 7,174 | 4,485 | 11,296 | 32 | 205 | 127 |
| Vermont | 4,953 | 3,148 | 1,804 | 4,921 | 7 | 11 | 14 |
| Virginia | 47,199 | 31,398 | 15,802 | 40,693 | 5,469 | 387 | 650 |
| Washington | 42,997 | 27,523 | 15,475 | 41,030 | 518 | 414 | 1,036 |
| West Virginia | 15,974 | 10,340 | 5,633 | 15,600 | 311 | 29 | 34 |
| Wisconsin | 44,996 | 29,532 | 15,464 | 43,888 | 709 | 201 | 197 |
| Wyoming | 3,471 | 2,142 | 1,329 | 3,385 | 11 | 50 | 24 |

| White Female | White Male | Black Female | Black Male | Hisp. Female | Hisp. Male | Other Female | Other Male | State |
|--------------|------------|--------------|------------|--------------|------------|--------------|------------|----------------------|
| 1,209,314 | 655,429 | 101,941 | 23,223 | 35,324 | 18,200 | 20,786 | 10,545 | Total U.S. |
| 17,470 | 9,407 | 3,874 | 804 | 62 | 37 | 76 | 38 | Alabama |
| 955 | 741 | 28 | 11 | 16 | 10 | 154 | 79 | Alaska |
| 22,324 | 13,832 | 370 | 113 | 1,130 | 614 | 427 | 201 | Arizona |
| 12,543 | 6,813 | 1,331 | 271 | 55 | 36 | 54 | 28 | Arkansas |
| 107,798 | 60,263 | 6,570 | 1,623 | 9,865 | 5,072 | 7,492 | 3,731 | California |
| 14,874 | 8,560 | 353 | 108 | 675 | 376 | 177 | 85 | Colorado |
| 19,779 | 9,949 | 855 | 199 | 289 | 143 | 114 | 65 | Connecticut |
| 3,531 | 1,982 | 433 | 105 | 26 | 15 | 29 | 15 | Delaware |
| 784 | 451 | 1,634 | 298 | 43 | 19 | 24 | 11 | District of Columbia |
| 90,169 | 54,542 | 6,024 | 1,556 | 4,967 | 2,374 | 563 | 287 | Florida |
| 24,083 | 12,857 | 6,035 | 1,354 | 233 | 150 | 243 | 136 | Georgia |
| 1,624 | 1,083 | 29 | 13 | 71 | 37 | 1,915 | 878 | Hawaii |
| 5,764 | 3,476 | 6 | 3 | 57 | 39 | 41 | 21 | Idaho |
| 53,703 | 27,055 | 5,408 | 1,236 | 1,090 | 650 | 676 | 357 | Illinois |
| 29,065 | 15,012 | 1,493 | 347 | 155 | 98 | 94 | 49 | Indiana |
| 18,531 | 9,503 | 127 | 35 | 51 | 32 | 44 | 23 | Iowa |
| 14,115 | 7,476 | 404 | 99 | 129 | 77 | 84 | 45 | Kansas |
| 18,315 | 9,754 | 911 | 202 | 44 | 28 | 50 | 26 | Kentucky |
| 14,838 | 8,032 | 4,093 | 941 | 163 | 77 | 104 | 60 | Louisiana |
| 7,339 | 4,097 | 13 | 5 | 11 | 5 | 20 | 10 | Maine |
| 19,864 | 10,694 | 4,286 | 1,038 | 226 | 107 | 370 | 199 | Maryland |
| 35,532 | 17,664 | 927 | 222 | 342 | 167 | 301 | 167 | Massachusetts |
| 45,121 | 24,044 | 4,255 | 970 | 256 | 153 | 282 | 153 | Michigan |
| 25,094 | 13,462 | 223 | 75 | 75 | 48 | 180 | 94 | Minnesota |
| 9,608 | 5,008 | 2,977 | 654 | 38 | 23 | 40 | 20 | Mississippi |
| 27,732 | 14,792 | 1,880 | 413 | 104 | 58 | 128 | 65 | Missouri |
| 4,598 | 2,769 | 6 | 2 | 18 | 9 | 66 | 33 | Montana |
| 9,308 | 4,974 | 150 | 40 | 56 | 37 | 40 | 19 | Nebraska |
| 6,670 | 4,645 | 365 | 118 | 311 | 182 | 261 | 123 | Nevada |
| 6,112 | 3,470 | 15 | 6 | 18 | 9 | 24 | 13 | New Hampshire |
| 40,101 | 20,397 | 3,383 | 775 | 1,266 | 628 | 713 | 394 | New Jersey |
| 5,301 | 3,189 | 90 | 28 | 1,072 | 564 | 229 | 107 | New Mexico |
| 82,183 | 42,195 | 9,618 | 1,979 | 3,572 | 1,583 | 1,708 | 946 | New York |
| 31,856 | 16,985 | 5,764 | 1,212 | 169 | 117 | 276 | 136 | North Carolina |
| 3,945 | 2,090 | 2 | 1 | 5 | 3 | 32 | 15 | North Dakota |
| 57,030 | 29,656 | 4,226 | 949 | 198 | 111 | 219 | 114 | Ohio |
| 15,144 | 8,576 | 665 | 166 | 114 | 72 | 467 | 227 | Oklahoma |
| 17,847 | 10,135 | 140 | 40 | 150 | 94 | 220 | 111 | Oregon |
| 76,595 | 38,504 | 4,453 | 887 | 346 | 191 | 320 | 176 | Pennsylvania |
| 6,772 | 3,273 | 108 | 31 | 77 | 36 | 33 | 19 | Rhode Island |
| 14,802 | 8,112 | 3,884 | 837 | 67 | 41 | 74 | 35 | South Carolina |
| 4,469 | 2,419 | 5 | 2 | 9 | 5 | 58 | 27 | South Dakota |
| 24,269 | 12,923 | 2,681 | 591 | 83 | 52 | 95 | 51 | Tennessee |
| 58,413 | 33,098 | 6,150 | 1,502 | 6,800 | 3,540 | 871 | 477 | Texas |
| 6,938 | 4,358 | 23 | 9 | 130 | 75 | 83 | 43 | Utah |
| 3,128 | 1,793 | 4 | 2 | 7 | 4 | 9 | 5 | Vermont |
| 26,258 | 14,436 | 4,452 | 1,017 | 255 | 131 | 432 | 218 | Virginia |
| 26,176 | 14,854 | 389 | 129 | 254 | 160 | 705 | 331 | Washington |
| 10,039 | 5,561 | 261 | 50 | 19 | 10 | 22 | 12 | West Virginia |
| 28,720 | 15,168 | 557 | 152 | 123 | 78 | 132 | 66 | Wisconsin |
| 2,086 | 1,299 | 9 | 3 | 31 | 19 | 16 | 8 | Wyoming |

Cataract

Cataract is a clouding of the eye's naturally clear lens. Most cataracts appear with advancing age. The exact cause of cataract is unclear, but it may be the result of a lifetime of exposure to ultraviolet radiation contained in sunlight, or may be related to other lifestyle factors such as cigarette smoking, diet and alcohol consumption.

Cataract can also occur at any age as a result of other causes such as eye injury, exposure to toxic substances or radiation, or as a result of other diseases such as diabetes.

Congenital cataracts may even be present at birth due to genetic defects or developmental problems. Cataracts in infants may also result from exposure to diseases such as rubella during pregnancy.

According to the World Health Organization, cataract is the leading cause of blindness in the world. In the United States, cataract is sometimes considered a conquered disease because treatment is widely available that can eliminate vision loss due to the disease. However, cataract still accounts for a significant amount of vision impairment in the U.S., particularly in older people who may have difficulty accessing appropriate eye care due to cost, availability or other barriers.

Treatment of cataract involves removal of the clouded natural lens. The lens is usually replaced with an artificial intraocular lens (IOL) implant. Cataract removal is now one of the most commonly performed surgical procedures with more than a million such surgeries performed each year.

Surgery is not truly a cure for cataract, however, and its success in controlling vision loss comes with a price. It is estimated that the direct annual medical costs for outpatient, inpatient and prescription drug services related to the treatment of cataract total \$6.8 billion.

Ongoing research into the normal healthy functioning of the eye's lens may help us better understand the causes of cataract and how they might be prevented. Even partial achievement of this goal might save hundreds of millions of dollars in the annual costs of treating cataract.

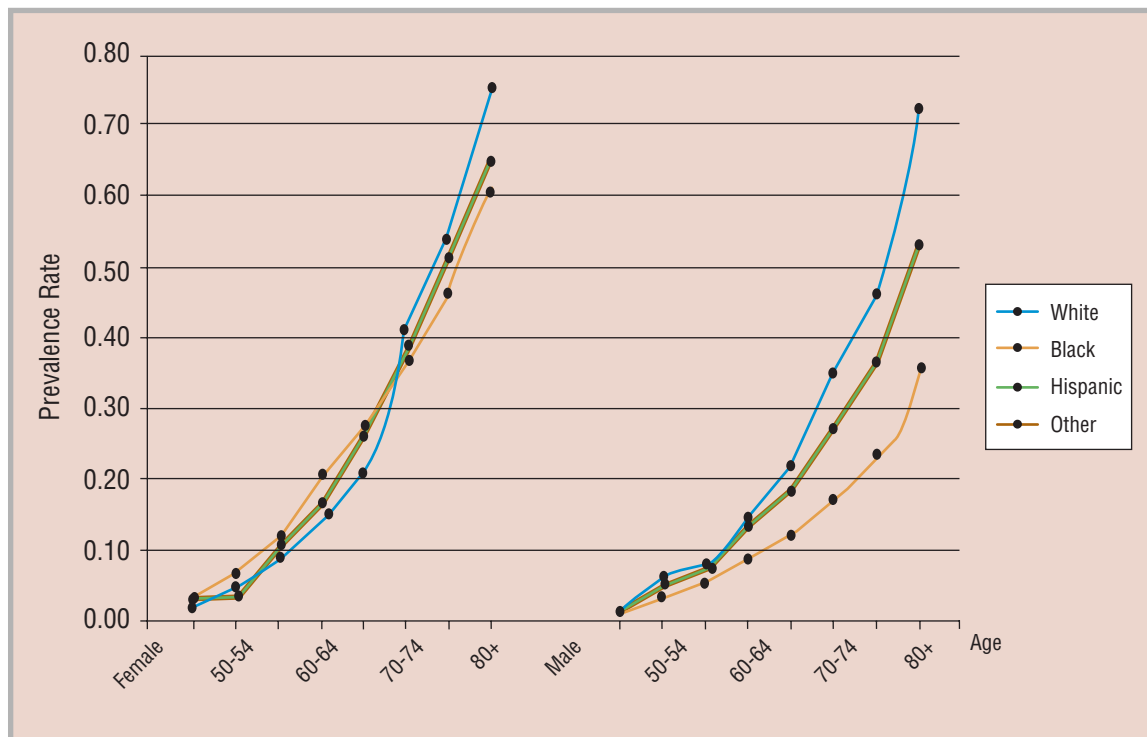
Because of the variety of opacifications possible, cases of cataract can be defined by a number of classification schemes. The cases included in the

prevalence statistics below include cortical cataract affecting 25% or more of the lens, posterior sub-capsular cataract 1mm or larger, and nuclear cataract greater than or equal to the next-to-the-highest grade in the grading system used (generally NII or NIII in the LOCS II grading system).

Cataract affects over 22 million Americans age 40 and older (see table on pages 24 and 25), or about one in every six people in this age range. By age 80, more than half of all Americans have cataract.

Cataract is slightly more common in women than in men (see chart below). It also affects Whites somewhat more frequently than other races, particularly with increasing age.

Estimated Specific Prevalence Rates for Cataract



Estimated Number of Cases of Cataract in the U.S. Population Age 40 and Older by State, Race and Sex

| State | Total | Female | Male | White | Black | Hispanic | Other |
|----------------------|------------|------------|-----------|------------|-----------|-----------|---------|
| Total U.S. | 22,325,926 | 13,699,339 | 8,626,587 | 18,570,408 | 1,717,309 | 1,292,613 | 745,595 |
| Alabama | 355,415 | 223,012 | 132,403 | 288,569 | 61,796 | 2,443 | 2,607 |
| Alaska | 29,476 | 16,225 | 13,251 | 22,823 | 629 | 575 | 5,448 |
| Arizona | 432,921 | 255,619 | 177,302 | 369,026 | 7,121 | 41,895 | 14,879 |
| Arkansas | 227,089 | 139,834 | 87,255 | 202,444 | 20,557 | 2,210 | 1,878 |
| California | 2,361,455 | 1,433,287 | 928,168 | 1,616,678 | 113,509 | 360,624 | 270,643 |
| Colorado | 287,678 | 171,115 | 116,563 | 249,318 | 6,858 | 25,323 | 6,179 |
| Connecticut | 304,151 | 189,004 | 115,147 | 274,923 | 14,825 | 10,208 | 4,195 |
| Delaware | 66,182 | 40,368 | 25,814 | 56,677 | 7,490 | 995 | 1,021 |
| District of Columbia | 38,536 | 25,678 | 12,857 | 12,202 | 24,051 | 1,465 | 818 |
| Florida | 1,701,548 | 1,024,589 | 676,959 | 1,389,852 | 109,924 | 182,089 | 19,684 |
| Georgia | 526,081 | 328,518 | 197,563 | 406,598 | 101,408 | 9,400 | 8,675 |
| Hawaii | 101,131 | 62,426 | 38,706 | 27,783 | 640 | 2,571 | 70,138 |
| Idaho | 99,393 | 58,047 | 41,346 | 95,490 | 154 | 2,289 | 1,459 |
| Illinois | 942,405 | 587,506 | 354,899 | 783,984 | 93,145 | 41,341 | 23,934 |
| Indiana | 480,044 | 296,478 | 183,566 | 445,336 | 25,286 | 6,138 | 3,284 |
| Iowa | 270,038 | 165,705 | 104,332 | 264,197 | 2,288 | 2,022 | 1,531 |
| Kansas | 221,576 | 134,942 | 86,634 | 206,646 | 6,938 | 5,010 | 2,983 |
| Kentucky | 319,339 | 196,262 | 123,076 | 301,008 | 14,837 | 1,753 | 1,740 |
| Louisiana | 319,320 | 200,397 | 118,923 | 240,511 | 69,172 | 5,834 | 3,803 |
| Maine | 119,018 | 71,713 | 47,305 | 117,715 | 253 | 382 | 669 |
| Maryland | 399,315 | 248,517 | 150,799 | 302,886 | 75,100 | 7,995 | 13,334 |
| Massachusetts | 542,352 | 337,194 | 205,158 | 503,051 | 16,088 | 11,988 | 11,225 |
| Michigan | 781,698 | 480,261 | 301,437 | 691,057 | 70,682 | 9,825 | 10,134 |
| Minnesota | 392,007 | 236,304 | 155,703 | 377,988 | 4,646 | 2,986 | 6,387 |
| Mississippi | 208,550 | 132,107 | 76,443 | 156,887 | 48,765 | 1,493 | 1,405 |
| Missouri | 470,051 | 289,152 | 180,898 | 430,135 | 31,489 | 3,931 | 4,495 |
| Montana | 78,906 | 46,195 | 32,712 | 75,863 | 110 | 641 | 2,292 |
| Nebraska | 144,457 | 87,925 | 56,532 | 138,083 | 2,769 | 2,275 | 1,330 |
| Nevada | 156,188 | 89,363 | 66,825 | 127,908 | 7,445 | 11,864 | 8,971 |
| New Hampshire | 101,420 | 60,339 | 41,081 | 99,595 | 338 | 635 | 852 |
| New Jersey | 702,942 | 438,929 | 264,012 | 573,311 | 58,497 | 45,198 | 25,936 |
| New Mexico | 137,271 | 82,196 | 55,076 | 87,925 | 1,725 | 39,683 | 7,939 |
| New York | 1,534,750 | 964,751 | 570,000 | 1,191,491 | 158,008 | 122,458 | 62,794 |
| North Carolina | 624,510 | 390,072 | 234,438 | 515,526 | 92,332 | 7,086 | 9,566 |
| North Dakota | 58,147 | 35,272 | 22,875 | 56,821 | 55 | 204 | 1,067 |
| Ohio | 945,043 | 585,844 | 359,199 | 859,177 | 70,669 | 7,459 | 7,737 |
| Oklahoma | 279,621 | 169,960 | 109,661 | 246,980 | 11,672 | 4,469 | 16,499 |
| Oregon | 290,512 | 173,287 | 117,225 | 274,398 | 2,464 | 5,830 | 7,821 |
| Pennsylvania | 1,176,500 | 734,496 | 442,004 | 1,082,486 | 69,615 | 12,845 | 11,554 |
| Rhode Island | 96,735 | 60,551 | 36,184 | 90,767 | 2,050 | 2,681 | 1,237 |
| South Carolina | 313,574 | 196,158 | 117,416 | 245,858 | 62,613 | 2,635 | 2,468 |
| South Dakota | 67,672 | 40,813 | 26,859 | 65,218 | 118 | 342 | 1,994 |
| Tennessee | 449,681 | 278,439 | 171,242 | 398,699 | 44,394 | 3,270 | 3,318 |
| Texas | 1,354,576 | 823,527 | 531,049 | 966,484 | 107,883 | 249,226 | 30,983 |
| Utah | 128,576 | 75,035 | 53,541 | 120,127 | 498 | 4,932 | 3,019 |
| Vermont | 52,086 | 30,964 | 21,122 | 51,379 | 116 | 282 | 309 |
| Virginia | 527,702 | 324,546 | 203,156 | 429,402 | 74,130 | 9,188 | 14,982 |
| Washington | 451,135 | 268,260 | 182,875 | 409,338 | 7,525 | 9,867 | 24,404 |
| West Virginia | 168,516 | 102,477 | 66,039 | 163,233 | 3,799 | 713 | 772 |
| Wisconsin | 450,030 | 273,301 | 176,729 | 429,864 | 10,677 | 4,838 | 4,651 |
| Wyoming | 38,608 | 22,381 | 16,226 | 36,693 | 155 | 1,208 | 553 |

| White Female | White Male | Black Female | Black Male | Hisp. Female | Hisp. Male | Other Female | Other Male | State |
|--------------|------------|--------------|------------|--------------|------------|--------------|------------|----------------------|
| 11,258,602 | 7,311,806 | 1,194,031 | 523,278 | 788,369 | 504,245 | 458,337 | 287,258 | Total U.S. |
| 176,356 | 112,213 | 43,658 | 18,138 | 1,402 | 1,041 | 1,595 | 1,012 | Alabama |
| 12,165 | 10,658 | 385 | 244 | 324 | 252 | 3,351 | 2,098 | Alaska |
| 216,650 | 152,376 | 4,585 | 2,536 | 25,027 | 16,868 | 9,357 | 5,522 | Arizona |
| 123,037 | 79,407 | 14,444 | 6,113 | 1,208 | 1,002 | 1,145 | 733 | Arkansas |
| 969,322 | 647,356 | 76,813 | 36,696 | 219,693 | 140,932 | 167,459 | 103,184 | California |
| 147,802 | 101,516 | 4,431 | 2,427 | 15,002 | 10,322 | 3,880 | 2,299 | Colorado |
| 169,862 | 105,061 | 10,371 | 4,454 | 6,310 | 3,898 | 2,461 | 1,734 | Connecticut |
| 34,054 | 22,622 | 5,135 | 2,355 | 571 | 424 | 608 | 413 | Delaware |
| 7,055 | 5,146 | 17,146 | 6,906 | 946 | 519 | 532 | 286 | District of Columbia |
| 823,240 | 566,611 | 75,014 | 34,910 | 114,300 | 67,789 | 12,034 | 7,649 | Florida |
| 246,892 | 159,706 | 71,357 | 30,051 | 5,158 | 4,242 | 5,111 | 3,564 | Georgia |
| 15,617 | 12,165 | 347 | 294 | 1,562 | 1,008 | 44,899 | 25,239 | Hawaii |
| 55,829 | 39,661 | 85 | 70 | 1,235 | 1,054 | 898 | 561 | Idaho |
| 484,151 | 299,833 | 65,120 | 28,025 | 23,698 | 17,643 | 14,537 | 9,397 | Illinois |
| 273,676 | 171,660 | 17,384 | 7,902 | 3,432 | 2,706 | 1,986 | 1,298 | Indiana |
| 162,145 | 102,052 | 1,496 | 792 | 1,141 | 881 | 924 | 607 | Iowa |
| 125,583 | 81,063 | 4,683 | 2,255 | 2,878 | 2,132 | 1,799 | 1,184 | Kansas |
| 183,949 | 117,059 | 10,269 | 4,568 | 982 | 771 | 1,062 | 678 | Kentucky |
| 146,380 | 94,131 | 48,086 | 21,087 | 3,708 | 2,125 | 2,223 | 1,580 | Louisiana |
| 70,916 | 46,798 | 146 | 107 | 234 | 148 | 417 | 252 | Maine |
| 183,487 | 119,400 | 52,059 | 23,041 | 4,998 | 2,997 | 7,973 | 5,361 | Maryland |
| 312,044 | 191,007 | 11,077 | 5,011 | 7,427 | 4,560 | 6,646 | 4,579 | Massachusetts |
| 419,869 | 271,188 | 48,701 | 21,981 | 5,653 | 4,171 | 6,038 | 4,096 | Michigan |
| 227,821 | 150,167 | 2,973 | 1,673 | 1,643 | 1,343 | 3,867 | 2,520 | Minnesota |
| 96,338 | 60,550 | 34,040 | 14,725 | 864 | 629 | 865 | 540 | Mississippi |
| 261,996 | 168,139 | 22,090 | 9,400 | 2,314 | 1,617 | 2,753 | 1,743 | Missouri |
| 44,314 | 31,549 | 65 | 46 | 387 | 254 | 1,429 | 863 | Montana |
| 83,987 | 54,096 | 1,864 | 904 | 1,238 | 1,037 | 835 | 495 | Nebraska |
| 72,111 | 55,797 | 4,779 | 2,666 | 6,830 | 5,034 | 5,643 | 3,328 | Nevada |
| 59,244 | 40,351 | 201 | 136 | 387 | 249 | 506 | 345 | New Hampshire |
| 354,549 | 218,761 | 40,940 | 17,557 | 28,000 | 17,198 | 15,440 | 10,495 | New Jersey |
| 51,995 | 35,930 | 1,090 | 636 | 24,088 | 15,594 | 5,023 | 2,916 | New Mexico |
| 734,747 | 456,744 | 113,328 | 44,680 | 79,353 | 43,105 | 37,323 | 25,471 | New York |
| 315,177 | 200,349 | 65,188 | 27,144 | 3,761 | 3,325 | 5,946 | 3,620 | North Carolina |
| 34,445 | 22,377 | 28 | 27 | 120 | 83 | 679 | 388 | North Dakota |
| 527,838 | 331,339 | 48,919 | 21,750 | 4,394 | 3,065 | 4,692 | 3,045 | Ohio |
| 149,185 | 97,795 | 7,940 | 3,733 | 2,488 | 1,981 | 10,348 | 6,151 | Oklahoma |
| 163,638 | 110,759 | 1,584 | 880 | 3,255 | 2,575 | 4,810 | 3,011 | Oregon |
| 670,759 | 411,726 | 49,229 | 20,386 | 7,636 | 5,209 | 6,871 | 4,683 | Pennsylvania |
| 56,768 | 33,999 | 1,360 | 690 | 1,690 | 991 | 732 | 504 | Rhode Island |
| 149,162 | 96,696 | 43,965 | 18,648 | 1,482 | 1,153 | 1,549 | 919 | South Carolina |
| 39,284 | 25,934 | 62 | 56 | 200 | 142 | 1,268 | 727 | South Dakota |
| 243,426 | 155,272 | 31,182 | 13,213 | 1,831 | 1,439 | 2,000 | 1,318 | Tennessee |
| 579,255 | 387,229 | 74,198 | 33,685 | 151,607 | 97,619 | 18,467 | 12,516 | Texas |
| 70,065 | 50,063 | 284 | 213 | 2,865 | 2,067 | 1,821 | 1,197 | Utah |
| 30,552 | 20,828 | 64 | 52 | 170 | 112 | 178 | 130 | Vermont |
| 258,657 | 170,745 | 51,121 | 23,009 | 5,563 | 3,625 | 9,205 | 5,778 | Virginia |
| 242,645 | 166,693 | 4,665 | 2,860 | 5,487 | 4,380 | 15,462 | 8,943 | Washington |
| 98,918 | 64,315 | 2,674 | 1,125 | 427 | 286 | 458 | 314 | West Virginia |
| 260,400 | 169,464 | 7,314 | 3,363 | 2,701 | 2,137 | 2,886 | 1,765 | Wisconsin |
| 21,243 | 15,449 | 94 | 61 | 697 | 511 | 347 | 206 | Wyoming |

Diabetic Retinopathy

Diabetic retinopathy is a common complication of diabetes. It affects the tiny blood vessels of the retina. Retinal blood vessels can break down, leak or become blocked— affecting and impairing vision over time. In some people with diabetic retinopathy, serious damage to the eye can occur when abnormal new blood vessels grow on the surface of the retina.

Diabetic retinopathy can affect almost anyone with diabetes. The U.S. Centers for Disease Control and Prevention (CDC) estimate that 10.3 million Americans have diagnosed diabetes, while an additional 5.4 million have diabetes that has not been diagnosed.

In general, the longer someone has diabetes, the greater the risk of developing diabetic retinopathy. Eventually, almost everyone with juvenile-onset diabetes will develop some signs of diabetic retinopathy. Those who acquire diabetes later in life are also at risk of diabetic retinopathy, although they are somewhat less likely to develop advanced diabetic retinopathy.

Diabetes also increases the risk of other eye diseases such as cataract and glaucoma. Because of its dangers to good vision, people with diabetes are urged to seek annual dilated eye exams.

Research suggests that the risk of diabetic retinopathy can be reduced through careful control of blood sugar. People with diabetes are also encouraged to control their blood pressure.

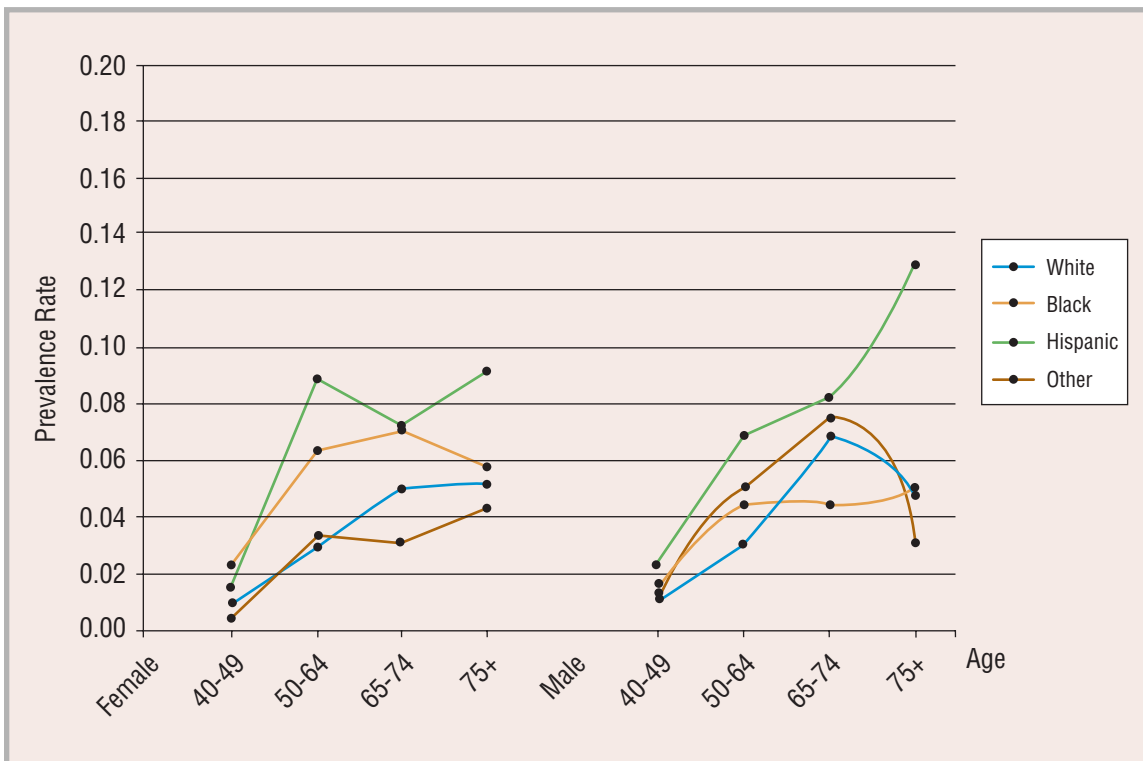
Laser treatment, called photocoagulation, has been shown to reduce the risk of sight loss in advanced cases of diabetic retinopathy. Focal photocoagulation can be used to destroy leaking blood vessels. Scatter photocoagulation, where a large number of spots are destroyed by the laser, is used to control the growth of abnormal blood vessels. In some cases vitrectomy, a surgical procedure to remove clouded fluid and gel from inside the eye, can help.

The prevalence estimates for cases of diabetic retinopathy on pages 28 and 29 include those with mild or worse retinopathy (grade 14 or higher based on fundus photographs), including definite non-proliferative retinopathy (e.g., microaneurysms, blot hemorrhages), macular edema or proliferative changes.

Diabetic retinopathy affects over 4.4 million Americans age 40 and older. Prior to age 40, diabetic retinopathy affects Whites more frequently than other races. In later decades, Hispanics are most commonly affected by the disease.

Due to a lack of information about diabetic retinopathy in other races, the prevalence estimates for "other" races are the arithmetic average of those for Whites, Blacks and Hispanics.

Estimated Specific Prevalence Rates for Diabetic Retinopathy



Estimated Number of Cases of Diabetic Retinopathy in the U.S. Population Age 40 and Older by State, Race and Sex

| State | Total | Female | Male | White | Black | Hispanic | Other |
|----------------------|-----------|-----------|-----------|-----------|---------|----------|---------|
| Total U.S.. | 4,482,885 | 2,300,979 | 2,181,905 | 3,122,598 | 538,896 | 633,375 | 188,016 |
| Alabama | 70,621 | 37,656 | 32,965 | 50,153 | 18,508 | 1,219 | 740 |
| Alaska | 7,610 | 3,291 | 4,319 | 5,495 | 260 | 384 | 1,472 |
| Arizona | 88,026 | 43,480 | 44,545 | 60,547 | 2,423 | 21,254 | 3,803 |
| Arkansas | 42,305 | 21,701 | 20,604 | 34,364 | 6,176 | 1,245 | 520 |
| California | 549,217 | 276,966 | 272,252 | 268,915 | 36,052 | 179,990 | 64,261 |
| Colorado | 63,132 | 30,868 | 32,264 | 46,526 | 2,378 | 12,603 | 1,625 |
| Connecticut | 55,483 | 28,882 | 26,600 | 44,050 | 4,789 | 5,444 | 1,199 |
| Delaware | 12,824 | 6,638 | 6,186 | 9,549 | 2,449 | 546 | 280 |
| District of Columbia | 9,471 | 5,667 | 3,804 | 2,161 | 6,368 | 742 | 200 |
| Florida | 328,595 | 170,017 | 158,579 | 210,842 | 35,816 | 76,580 | 5,358 |
| Georgia | 117,292 | 61,974 | 55,318 | 75,098 | 34,157 | 5,414 | 2,624 |
| Hawaii | 20,531 | 9,609 | 10,922 | 5,163 | 252 | 1,335 | 13,781 |
| Idaho | 18,776 | 8,925 | 9,850 | 16,993 | 62 | 1,342 | 379 |
| Illinois | 187,928 | 97,924 | 90,004 | 130,195 | 28,686 | 22,582 | 6,465 |
| Indiana | 88,257 | 44,901 | 43,356 | 76,328 | 7,753 | 3,236 | 941 |
| Iowa | 44,851 | 22,470 | 22,380 | 42,520 | 770 | 1,111 | 449 |
| Kansas | 39,555 | 19,799 | 19,755 | 33,917 | 2,181 | 2,608 | 848 |
| Kentucky | 59,863 | 30,192 | 29,671 | 53,838 | 4,589 | 932 | 504 |
| Louisiana | 67,106 | 36,243 | 30,863 | 41,865 | 21,575 | 2,606 | 1,060 |
| Maine | 20,926 | 10,271 | 10,655 | 20,444 | 93 | 191 | 198 |
| Maryland | 84,663 | 45,358 | 39,305 | 51,893 | 24,996 | 4,185 | 3,590 |
| Massachusetts | 96,239 | 49,506 | 46,733 | 81,520 | 5,230 | 6,512 | 2,977 |
| Michigan | 147,805 | 75,916 | 71,889 | 118,178 | 21,693 | 5,061 | 2,872 |
| Minnesota | 70,223 | 34,358 | 35,865 | 64,807 | 1,873 | 1,728 | 1,816 |
| Mississippi | 43,345 | 23,560 | 19,785 | 27,219 | 15,021 | 728 | 377 |
| Missouri | 85,696 | 43,914 | 41,783 | 72,797 | 9,696 | 1,990 | 1,214 |
| Montana | 14,446 | 6,843 | 7,602 | 13,433 | 38 | 334 | 640 |
| Nebraska | 25,185 | 12,587 | 12,598 | 22,631 | 914 | 1,266 | 374 |
| Nevada | 34,547 | 16,361 | 18,186 | 23,438 | 2,427 | 6,391 | 2,291 |
| New Hampshire | 18,752 | 9,072 | 9,680 | 18,019 | 131 | 352 | 250 |
| New Jersey | 140,099 | 73,503 | 66,596 | 91,845 | 18,245 | 22,721 | 7,288 |
| New Mexico | 35,727 | 18,040 | 17,688 | 15,170 | 549 | 17,986 | 2,022 |
| New York | 315,153 | 168,332 | 146,821 | 191,874 | 48,007 | 58,561 | 16,711 |
| North Carolina | 124,896 | 65,717 | 59,180 | 89,749 | 28,293 | 4,217 | 2,637 |
| North Dakota | 9,547 | 4,696 | 4,851 | 9,115 | 28 | 105 | 299 |
| Ohio | 171,467 | 88,715 | 82,752 | 144,515 | 21,068 | 3,731 | 2,153 |
| Oklahoma | 52,321 | 26,023 | 26,298 | 41,974 | 3,744 | 2,512 | 4,091 |
| Oregon | 53,012 | 25,813 | 27,198 | 46,786 | 834 | 3,354 | 2,037 |
| Pennsylvania | 200,754 | 104,511 | 96,243 | 170,715 | 20,143 | 6,709 | 3,187 |
| Rhode Island | 16,579 | 8,613 | 7,967 | 14,127 | 686 | 1,437 | 329 |
| South Carolina | 64,714 | 34,646 | 30,068 | 43,272 | 19,310 | 1,427 | 704 |
| South Dakota | 11,259 | 5,489 | 5,770 | 10,499 | 48 | 173 | 539 |
| Tennessee | 87,753 | 45,260 | 42,493 | 70,806 | 14,162 | 1,802 | 982 |
| Texas | 337,117 | 173,019 | 164,098 | 171,077 | 35,568 | 121,459 | 9,012 |
| Utah | 25,255 | 12,129 | 13,126 | 21,629 | 186 | 2,657 | 783 |
| Vermont | 9,545 | 4,630 | 4,915 | 9,280 | 45 | 125 | 96 |
| Virginia | 109,608 | 56,677 | 52,932 | 77,193 | 23,011 | 5,227 | 4,177 |
| Washington | 87,169 | 42,001 | 45,168 | 72,514 | 2,741 | 5,685 | 6,229 |
| West Virginia | 29,685 | 14,761 | 14,924 | 28,114 | 1,050 | 311 | 210 |
| Wisconsin | 80,310 | 39,848 | 40,462 | 72,610 | 3,769 | 2,665 | 1,266 |
| Wyoming | 7,644 | 3,606 | 4,038 | 6,839 | 51 | 600 | 154 |

| White Female | White Male | Black Female | Black Male | Hisp. Female | Hisp. Male | Other Female | Other Male | State |
|--------------|------------|--------------|------------|--------------|------------|--------------|------------|----------------------|
| 1,545,887 | 1,576,711 | 342,059 | 196,837 | 333,815 | 299,561 | 79,219 | 108,797 | Total U.S. |
| 24,837 | 25,317 | 11,922 | 6,586 | 587 | 632 | 311 | 430 | Alabama |
| 2,350 | 3,145 | 142 | 117 | 194 | 189 | 605 | 867 | Alaska |
| 29,418 | 31,128 | 1,393 | 1,030 | 11,020 | 10,234 | 1,649 | 2,154 | Arizona |
| 16,970 | 17,394 | 3,925 | 2,251 | 589 | 656 | 218 | 302 | Arkansas |
| 131,859 | 137,055 | 22,197 | 13,856 | 95,159 | 84,831 | 27,751 | 36,510 | California |
| 22,373 | 24,153 | 1,360 | 1,017 | 6,432 | 6,171 | 702 | 923 | Colorado |
| 22,373 | 21,676 | 3,072 | 1,718 | 2,970 | 2,475 | 468 | 732 | Connecticut |
| 4,708 | 4,842 | 1,544 | 906 | 274 | 272 | 114 | 166 | Delaware |
| 995 | 1,165 | 4,177 | 2,191 | 404 | 338 | 90 | 110 | District of Columbia |
| 104,179 | 106,663 | 22,365 | 13,451 | 41,226 | 35,353 | 2,246 | 3,112 | Florida |
| 36,694 | 38,403 | 21,765 | 12,392 | 2,491 | 2,923 | 1,024 | 1,600 | Georgia |
| 2,340 | 2,823 | 116 | 136 | 710 | 624 | 6,443 | 7,338 | Hawaii |
| 8,100 | 8,893 | 29 | 33 | 635 | 707 | 161 | 217 | Idaho |
| 65,436 | 64,759 | 18,570 | 10,116 | 11,284 | 11,298 | 2,634 | 3,831 | Illinois |
| 38,074 | 38,254 | 4,887 | 2,866 | 1,557 | 1,679 | 383 | 558 | Indiana |
| 21,303 | 21,218 | 447 | 323 | 536 | 575 | 185 | 264 | Iowa |
| 16,844 | 17,073 | 1,329 | 853 | 1,283 | 1,325 | 343 | 505 | Kansas |
| 26,673 | 27,165 | 2,876 | 1,713 | 438 | 494 | 205 | 300 | Kentucky |
| 20,673 | 21,192 | 13,758 | 7,817 | 1,397 | 1,209 | 416 | 644 | Louisiana |
| 10,040 | 10,404 | 45 | 47 | 103 | 88 | 83 | 115 | Maine |
| 25,668 | 26,225 | 15,969 | 9,027 | 2,262 | 1,923 | 1,459 | 2,131 | Maryland |
| 41,474 | 40,046 | 3,263 | 1,967 | 3,589 | 2,923 | 1,180 | 1,797 | Massachusetts |
| 58,452 | 59,726 | 13,800 | 7,893 | 2,523 | 2,538 | 1,141 | 1,732 | Michigan |
| 31,756 | 33,051 | 1,048 | 824 | 821 | 907 | 733 | 1,083 | Minnesota |
| 13,486 | 13,732 | 9,564 | 5,457 | 347 | 381 | 162 | 214 | Mississippi |
| 36,154 | 36,643 | 6,245 | 3,451 | 1,008 | 982 | 506 | 708 | Missouri |
| 6,383 | 7,050 | 18 | 20 | 178 | 156 | 264 | 376 | Montana |
| 11,272 | 11,359 | 556 | 358 | 599 | 667 | 160 | 214 | Nebraska |
| 10,734 | 12,704 | 1,434 | 993 | 3,192 | 3,199 | 1,002 | 1,289 | Nevada |
| 8,716 | 9,303 | 69 | 62 | 188 | 164 | 99 | 151 | New Hampshire |
| 46,659 | 45,186 | 11,757 | 6,488 | 12,237 | 10,484 | 2,850 | 4,438 | New Jersey |
| 7,384 | 7,787 | 304 | 245 | 9,467 | 8,519 | 885 | 1,137 | New Mexico |
| 97,137 | 94,737 | 31,606 | 16,401 | 32,976 | 25,585 | 6,613 | 10,099 | New York |
| 44,618 | 45,131 | 18,122 | 10,171 | 1,878 | 2,339 | 1,099 | 1,538 | North Carolina |
| 4,501 | 4,614 | 12 | 16 | 54 | 51 | 129 | 170 | North Dakota |
| 72,516 | 71,999 | 13,416 | 7,652 | 1,907 | 1,824 | 876 | 1,278 | Ohio |
| 20,746 | 21,228 | 2,308 | 1,436 | 1,217 | 1,295 | 1,752 | 2,340 | Oklahoma |
| 22,878 | 23,908 | 465 | 369 | 1,611 | 1,743 | 860 | 1,178 | Oregon |
| 86,739 | 83,976 | 13,018 | 7,126 | 3,482 | 3,228 | 1,273 | 1,914 | Pennsylvania |
| 7,276 | 6,851 | 409 | 277 | 797 | 640 | 131 | 198 | Rhode Island |
| 21,304 | 21,968 | 12,372 | 6,938 | 671 | 756 | 299 | 405 | South Carolina |
| 5,153 | 5,346 | 21 | 28 | 85 | 88 | 231 | 308 | South Dakota |
| 34,967 | 35,840 | 9,056 | 5,106 | 842 | 960 | 395 | 588 | Tennessee |
| 83,320 | 87,756 | 22,199 | 13,369 | 63,925 | 57,534 | 3,574 | 5,438 | Texas |
| 10,379 | 11,249 | 91 | 95 | 1,327 | 1,330 | 332 | 451 | Utah |
| 4,506 | 4,774 | 22 | 23 | 65 | 60 | 38 | 58 | Vermont |
| 37,707 | 39,486 | 14,462 | 8,548 | 2,760 | 2,467 | 1,747 | 2,431 | Virginia |
| 35,008 | 37,506 | 1,491 | 1,250 | 2,775 | 2,910 | 2,727 | 3,502 | Washington |
| 13,869 | 14,245 | 650 | 400 | 158 | 153 | 84 | 126 | West Virginia |
| 35,671 | 36,939 | 2,368 | 1,401 | 1,286 | 1,379 | 523 | 743 | Wisconsin |
| 3,216 | 3,623 | 26 | 25 | 298 | 302 | 66 | 88 | Wyoming |

Glaucoma

Glaucoma is a disease that causes a gradual degeneration of cells that make up the optic nerve, which carries visual information from the eye to the brain. As the nerve cells die, vision is slowly lost, usually beginning in the periphery. Often, the loss of vision is unnoticeable until a significant amount of nerve damage has occurred. For this reason, as many as half of all people with glaucoma may be unaware of their disease.

The exact cause of primary open-angle glaucoma, the most common form of the disease, is uncertain. Other forms of glaucoma (such as angle-closure, secondary and congenital glaucoma) occur in relation to specific physical causes.

Elevated fluid pressure within the eye (intraocular pressure) seems related in some way to all cases of glaucoma. The majority of cases of glaucoma exhibit intraocular pressure outside normal limits at some time. However, even those cases with apparently normal pressure seem to benefit from treatment aimed at lowering pressure.

Most cases of glaucoma can be controlled and vision loss slowed or halted by treatment. Medications, laser treatments and surgery can be used to lower intraocular pressure. However, any vision lost to glaucoma cannot be restored.

Unfortunately, glaucoma cannot be prevented. Factors that increase the risk of glaucoma include age, race, diabetes, eye trauma and long-term use of steroid medications.

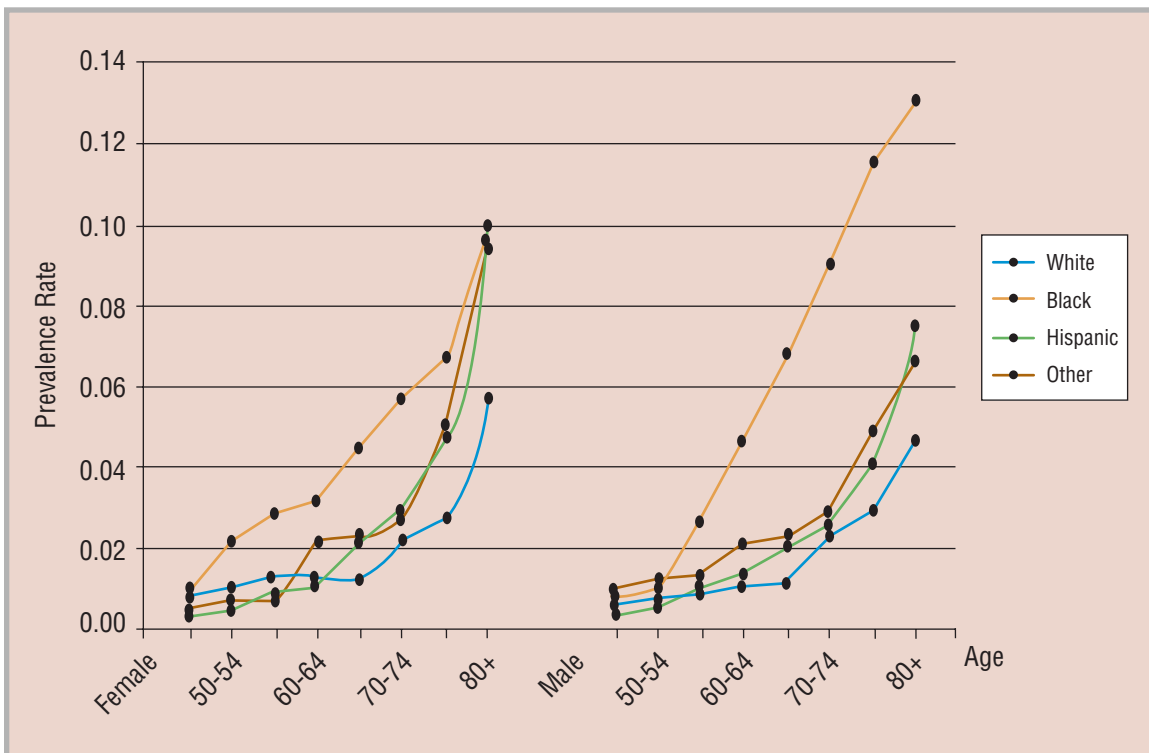
Glaucoma is traditionally defined by a triad of signs, including the presence of at least two of the following: elevated intraocular pressure, optic disc cupping and visual field loss. However, case definitions used in the various epidemiologic studies of the disease have differed on specific criteria. Only cases of primary open-angle glaucoma that had clear signs of optic nerve head damage and/or reproducible visual field loss (definite open-angle glaucoma) are included in the prevalence estimates.

The table on pages 32 and 33 lists state-by-state prevalence estimates for glaucoma by race and sex. Glaucoma affects almost 2.3 million Americans age 40 and older, or about 1.9% of this population. Glaucoma prevalence is clearly related to age and race (on p. 31). In general, glaucoma is more common in Blacks, Hispanics and with increasing age.

In the 65-69 age group, the prevalence rate for White females is about 1.6%, while in Black females the rate is almost three times higher at 4.6%. For those age 80 and older, glaucoma affects more than 10% of Black men and Hispanic women.

Glaucoma appears to be more common initially in women, but by age 65, prevalence becomes more comparable between the sexes.

Estimated Specific Prevalence Rates for Open-Angle Glaucoma

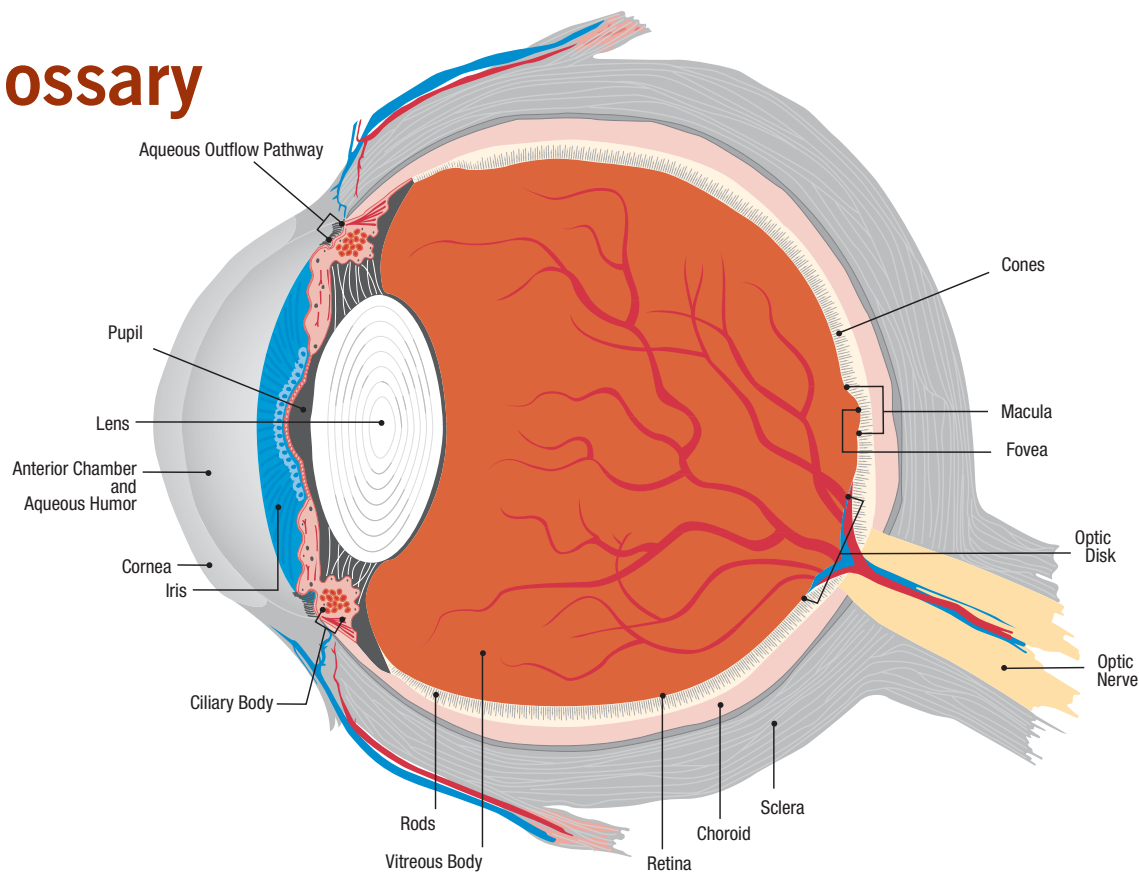


Estimated Number of Cases of Definite Primary Open Angle Glaucoma in the U.S. Population Age 40 and Older by State, Race and Sex

| State | Total | Female | Male | White | Black | Hispanic | Other |
|----------------------|-----------|-----------|---------|-----------|---------|----------|---------|
| Total U.S. | 2,290,846 | 1,388,698 | 902,148 | 1,589,670 | 440,861 | 153,860 | 106,455 |
| Alabama | 40,621 | 24,489 | 16,131 | 24,387 | 15,548 | 297 | 389 |
| Alaska | 3,281 | 1,858 | 1,424 | 2,230 | 184 | 70 | 798 |
| Arizona | 39,674 | 23,485 | 16,189 | 30,660 | 1,926 | 4,963 | 2,125 |
| Arkansas | 22,742 | 13,813 | 8,929 | 17,007 | 5,189 | 269 | 277 |
| California | 249,602 | 148,472 | 101,130 | 139,063 | 29,533 | 43,221 | 37,785 |
| Colorado | 27,989 | 16,870 | 11,119 | 22,197 | 1,860 | 3,026 | 906 |
| Connecticut | 29,434 | 18,367 | 11,068 | 23,737 | 3,834 | 1,225 | 638 |
| Delaware | 7,037 | 4,207 | 2,830 | 4,801 | 1,968 | 120 | 149 |
| District of Columbia | 7,157 | 4,111 | 3,046 | 1,062 | 5,804 | 176 | 115 |
| Florida | 166,640 | 99,070 | 67,570 | 113,539 | 28,847 | 21,402 | 2,853 |
| Georgia | 64,469 | 38,861 | 25,608 | 35,475 | 26,506 | 1,156 | 1,331 |
| Hawaii | 12,317 | 7,221 | 5,096 | 2,459 | 189 | 305 | 9,364 |
| Idaho | 8,832 | 5,308 | 3,525 | 8,298 | 46 | 278 | 211 |
| Illinois | 99,577 | 60,820 | 38,756 | 67,449 | 23,737 | 4,929 | 3,462 |
| Indiana | 46,142 | 28,511 | 17,630 | 38,416 | 6,488 | 742 | 495 |
| Iowa | 23,651 | 14,814 | 8,837 | 22,559 | 612 | 248 | 232 |
| Kansas | 20,611 | 12,681 | 7,931 | 17,758 | 1,799 | 607 | 447 |
| Kentucky | 30,265 | 18,699 | 11,566 | 25,995 | 3,797 | 211 | 262 |
| Louisiana | 39,541 | 23,522 | 16,019 | 20,581 | 17,712 | 689 | 559 |
| Maine | 10,374 | 6,422 | 3,952 | 10,154 | 72 | 46 | 102 |
| Maryland | 48,909 | 29,234 | 19,675 | 26,317 | 19,686 | 968 | 1,937 |
| Massachusetts | 50,610 | 31,770 | 18,841 | 43,329 | 4,183 | 1,441 | 1,658 |
| Michigan | 80,583 | 48,971 | 31,612 | 59,827 | 18,059 | 1,177 | 1,520 |
| Minnesota | 35,695 | 22,046 | 13,649 | 33,037 | 1,323 | 369 | 966 |
| Mississippi | 26,059 | 15,552 | 10,507 | 13,237 | 12,436 | 180 | 205 |
| Missouri | 45,943 | 28,233 | 17,710 | 36,797 | 8,019 | 472 | 655 |
| Montana | 7,009 | 4,217 | 2,793 | 6,564 | 31 | 76 | 338 |
| Nebraska | 13,013 | 8,043 | 4,970 | 11,807 | 731 | 278 | 198 |
| Nevada | 15,517 | 8,789 | 6,728 | 10,859 | 1,999 | 1,410 | 1,249 |
| New Hampshire | 9,118 | 5,609 | 3,509 | 8,814 | 97 | 77 | 130 |
| New Jersey | 73,158 | 44,851 | 28,307 | 48,990 | 14,959 | 5,348 | 3,861 |
| New Mexico | 13,754 | 8,157 | 5,596 | 7,463 | 459 | 4,688 | 1,143 |
| New York | 164,395 | 101,075 | 63,320 | 101,305 | 39,592 | 14,374 | 9,123 |
| North Carolina | 69,683 | 42,199 | 27,484 | 44,002 | 23,381 | 884 | 1,416 |
| North Dakota | 5,045 | 3,135 | 1,911 | 4,843 | 17 | 25 | 160 |
| Ohio | 93,852 | 57,763 | 36,089 | 73,894 | 17,918 | 894 | 1,146 |
| Oklahoma | 26,767 | 16,185 | 10,582 | 20,861 | 3,038 | 537 | 2,332 |
| Oregon | 26,212 | 15,953 | 10,258 | 23,700 | 662 | 715 | 1,135 |
| Pennsylvania | 112,325 | 70,012 | 42,313 | 91,756 | 17,321 | 1,544 | 1,705 |
| Rhode Island | 8,852 | 5,610 | 3,242 | 7,800 | 545 | 325 | 182 |
| South Carolina | 37,509 | 22,413 | 15,096 | 20,922 | 15,898 | 321 | 367 |
| South Dakota | 5,923 | 3,651 | 2,272 | 5,552 | 35 | 42 | 294 |
| Tennessee | 46,496 | 28,436 | 18,061 | 34,186 | 11,407 | 401 | 502 |
| Texas | 145,790 | 86,920 | 58,870 | 83,327 | 28,242 | 29,566 | 4,655 |
| Utah | 11,648 | 6,971 | 4,677 | 10,470 | 142 | 594 | 442 |
| Vermont | 4,631 | 2,844 | 1,786 | 4,513 | 34 | 35 | 48 |
| Virginia | 59,790 | 35,730 | 24,060 | 37,404 | 19,063 | 1,114 | 2,209 |
| Washington | 42,820 | 25,876 | 16,944 | 36,025 | 2,095 | 1,204 | 3,497 |
| West Virginia | 14,954 | 9,210 | 5,744 | 13,828 | 929 | 86 | 111 |
| Wisconsin | 41,344 | 25,566 | 15,778 | 37,194 | 2,868 | 589 | 693 |
| Wyoming | 3,486 | 2,080 | 1,406 | 3,218 | 42 | 144 | 81 |

| White Female | White Male | Black Female | Black Male | Hisp. Female | Hisp. Male | Other Female | Other Male | State |
|--------------|------------|--------------|------------|--------------|------------|--------------|------------|----------------------|
| 991,193 | 598,477 | 247,981 | 192,881 | 89,804 | 64,056 | 59,721 | 46,735 | Total U.S. |
| 15,222 | 9,165 | 8,886 | 6,661 | 163 | 134 | 218 | 171 | Alabama |
| 1,281 | 948 | 93 | 91 | 37 | 33 | 446 | 351 | Alaska |
| 18,453 | 12,206 | 981 | 945 | 2,830 | 2,134 | 1,221 | 904 | Arizona |
| 10,566 | 6,441 | 2,953 | 2,236 | 139 | 130 | 154 | 123 | Arkansas |
| 85,909 | 53,154 | 16,000 | 13,533 | 25,201 | 18,020 | 21,362 | 16,424 | California |
| 13,680 | 8,517 | 955 | 904 | 1,716 | 1,310 | 519 | 387 | Colorado |
| 15,119 | 8,618 | 2,183 | 1,651 | 724 | 501 | 340 | 298 | Connecticut |
| 2,967 | 1,835 | 1,094 | 874 | 65 | 54 | 81 | 68 | Delaware |
| 634 | 427 | 3,299 | 2,505 | 109 | 67 | 69 | 46 | District of Columbia |
| 68,678 | 44,860 | 15,849 | 12,997 | 12,948 | 8,454 | 1,595 | 1,258 | Florida |
| 22,174 | 13,301 | 15,371 | 11,135 | 600 | 556 | 715 | 616 | Georgia |
| 1,436 | 1,023 | 81 | 107 | 176 | 129 | 5,527 | 3,837 | Hawaii |
| 5,027 | 3,271 | 20 | 26 | 142 | 136 | 119 | 92 | Idaho |
| 42,818 | 24,631 | 13,409 | 10,328 | 2,677 | 2,252 | 1,916 | 1,546 | Illinois |
| 24,260 | 14,157 | 3,584 | 2,905 | 395 | 347 | 273 | 221 | Indiana |
| 14,234 | 8,325 | 319 | 293 | 133 | 115 | 128 | 104 | Iowa |
| 11,127 | 6,631 | 974 | 825 | 333 | 274 | 246 | 201 | Kansas |
| 16,322 | 9,673 | 2,120 | 1,677 | 112 | 99 | 145 | 117 | Kentucky |
| 12,846 | 7,735 | 9,956 | 7,756 | 423 | 267 | 297 | 262 | Louisiana |
| 6,304 | 3,850 | 33 | 39 | 27 | 19 | 58 | 44 | Maine |
| 16,461 | 9,857 | 11,133 | 8,554 | 578 | 390 | 1,062 | 874 | Maryland |
| 27,684 | 15,645 | 2,338 | 1,845 | 855 | 586 | 893 | 764 | Massachusetts |
| 37,456 | 22,371 | 10,046 | 8,014 | 645 | 531 | 824 | 697 | Michigan |
| 20,617 | 12,419 | 705 | 618 | 193 | 176 | 530 | 436 | Minnesota |
| 8,298 | 4,939 | 7,039 | 5,398 | 100 | 81 | 115 | 90 | Mississippi |
| 23,041 | 13,756 | 4,561 | 3,459 | 265 | 207 | 366 | 289 | Missouri |
| 3,968 | 2,596 | 13 | 17 | 44 | 32 | 191 | 147 | Montana |
| 7,390 | 4,418 | 396 | 334 | 144 | 134 | 113 | 84 | Nebraska |
| 6,299 | 4,559 | 1,001 | 998 | 770 | 640 | 718 | 531 | Nevada |
| 5,447 | 3,366 | 46 | 51 | 45 | 32 | 71 | 60 | New Hampshire |
| 31,131 | 17,860 | 8,464 | 6,495 | 3,171 | 2,177 | 2,085 | 1,776 | New Jersey |
| 4,539 | 2,924 | 224 | 236 | 2,733 | 1,955 | 661 | 482 | New Mexico |
| 64,120 | 37,185 | 23,094 | 16,498 | 8,945 | 5,428 | 4,915 | 4,208 | New York |
| 27,577 | 16,425 | 13,374 | 10,007 | 445 | 439 | 803 | 613 | North Carolina |
| 3,020 | 1,823 | 8 | 10 | 14 | 11 | 93 | 68 | North Dakota |
| 46,669 | 27,225 | 9,955 | 7,962 | 503 | 391 | 636 | 510 | Ohio |
| 12,903 | 7,958 | 1,663 | 1,374 | 281 | 255 | 1,337 | 995 | Oklahoma |
| 14,601 | 9,099 | 336 | 326 | 378 | 336 | 638 | 496 | Oregon |
| 58,322 | 33,434 | 9,886 | 7,435 | 879 | 665 | 925 | 780 | Pennsylvania |
| 5,023 | 2,777 | 292 | 253 | 197 | 128 | 98 | 83 | Rhode Island |
| 13,000 | 7,922 | 9,030 | 6,868 | 172 | 149 | 211 | 156 | South Carolina |
| 3,443 | 2,109 | 14 | 21 | 23 | 18 | 170 | 124 | South Dakota |
| 21,404 | 12,783 | 6,542 | 4,865 | 214 | 187 | 276 | 226 | Tennessee |
| 51,423 | 31,904 | 15,792 | 12,450 | 17,185 | 12,381 | 2,520 | 2,135 | Texas |
| 6,335 | 4,135 | 64 | 78 | 328 | 265 | 244 | 199 | Utah |
| 2,783 | 1,731 | 15 | 19 | 21 | 15 | 26 | 22 | Vermont |
| 23,246 | 14,158 | 10,600 | 8,464 | 641 | 473 | 1,244 | 965 | Virginia |
| 22,174 | 13,852 | 1,038 | 1,056 | 637 | 566 | 2,027 | 1,470 | Washington |
| 8,578 | 5,250 | 521 | 408 | 50 | 36 | 61 | 50 | West Virginia |
| 23,250 | 13,943 | 1,612 | 1,256 | 313 | 276 | 391 | 302 | Wisconsin |
| 1,934 | 1,285 | 19 | 23 | 80 | 64 | 47 | 35 | Wyoming |

Glossary



accommodation: ability of the lens to adjust its shape for vision at various distances in order to produce a clear image on the retina

anterior chamber: space in front portion of the eye between the cornea and the iris and lens, which is filled with aqueous humor

aqueous humor: clear, watery fluid that fills the anterior chamber and the posterior chamber in the front part of the eye and provides nutrients to structures in the anterior chamber

aqueous outflow pathway: the main exit route of aqueous humor from the eye, including the trabecular meshwork and Schlemm's canal

astigmatism: irregular curvature of the cornea or lens resulting in a distorted image because light rays are not focused on a single point on the retina

binocular vision: coordinated use of the two eyes to see a single fused three-dimensional image

blindspot: in testing the visual field, this is the blind area corresponding to the optic disk where the optic nerve fibers exit the eye and where there are no light-sensitive cells

central visual field: the area of objects in space seen without moving the head or eyes; corresponds to an area within 30 degrees of the fixation point (fovea)

choroid: the middle layer of the eye containing blood vessels that furnish nourishment to the other parts of the eye, especially the retina

ciliary body: a ring of tissue between the iris and the choroid consisting of muscles and blood vessels that changes the shape of the lens and manufactures aqueous humor

color vision deficiency (color blindness): inability to recognize certain colors, primarily red or green, but rarely blue

cones: cone-shaped, light-sensitive cells in the retina particularly in the macula area; cone function predominates in daylight with a small pupil allowing one to make out details and shapes, especially colors

congenital: present at birth

conjunctiva: delicate tissue that lines the inside of the eyelids and covers the front part of the eye except the cornea

cornea: the clear, curved structure that comprises the front of the eye, a refractive surface through which light enters

degeneration: tissue changes that make it less able to carry out its function

depth perception: the blending of slightly dissimilar images from the two eyes for the perception of three-dimensional depth

diopter: metric unit used to denote the refractive error of the eye or lens

distance vision: ability to distinctly perceive objects at a distance, usually tested at 20 feet

farsightedness: also called hyperopia; a refractive error in which the focal point for light rays is behind the retina; distant objects are seen more clearly than near objects

focus: the point at which light rays meet after passing through the cornea and lens; in normal eyes this point is on the fovea of the retina

hereditary: appearing in, or characteristic of, successive generations; individual differences in human beings passed from parent to offspring

incidence: number of new cases of a particular problem or disease that occurs within a period of time

iris: colored, circular membrane that is in front of the lens and controls the size of the opening at its center (pupil), thereby regulating the amount of light entering the eye

laser: surgical tool using an intense beam of light energy to close rips, make holes, destroy new vessels (photocoagulation) or to open channels as in the treatment of glaucoma

legal blindness: visual acuity that does not exceed 20/200 in the better eye with correcting lens; field of vision no greater than 20 degrees in its widest angle (visual acuity of 20/200 means that a person can see at a distance of 20 feet what one with "normal" sight can see at 200 feet)

low-vision aids: powerful optical devices useful to persons with vision impairments that are not successfully corrected by the usual prescription lenses

macula: a rod-free area at the center of the retina that surrounds the fovea and is responsible for best central vision

myopia: see nearsightedness

nearsightedness: also called myopia; a refractive error of the eye where the image of a distant object is formed in front of the retina and cannot be seen distinctly; near objects are seen more clearly than distant objects

near vision: the ability to perceive objects distinctly at normal reading distance (usually about 14 inches from the eye)

night blindness: condition in which sight is good by day but deficient at night and in any faint light

optic disk: head of optic nerve; formed by the meeting of all retinal nerve fibers in the retina

optic nerve: special nerve of sight beginning in the retina as the optic disk, which carries messages from the retina to the brain, resulting in visual images

peripheral vision: the ability to perceive the presence or motion of objects outside the direct line of vision

presbyopia: decreased elasticity of the lens due to advancing age which moves the near point of vision farther from the eye, making it difficult to focus on near objects

prevalence: total number of cases of a problem or disease in the population at a given time

pupil: the opening in the center of the iris that appears as a black dot and through which light enters the eye

refraction: measurement of the focusing characteristics of the eye to determine refractive error and the need for prescription glasses

retina: innermost layer of the eye containing light-sensitive nerve cells and fibers connecting with the brain through the optic nerve and nourished by a network of blood vessels; receives image and sends it to the brain

rods: light-sensitive cells in the retina that work best in darkness or dim illuminations

sclera: the white part of the eye; a tough covering that along with the cornea forms the external protective layer of the eye

severe vision impairment: inability to read ordinary newspaper print, even with the aid of glasses, and impairment indicating no useful vision in either eye; includes those who are legally blind

20/20 vision: the ability to correctly perceive an object or letter of a designated size from a distance of 20 feet; normal visual acuity

visual acuity: measurement of the ability of the eye to perceive the shape of objects in the direct line of vision and to distinguish detail; generally determined by finding the smallest symbol on an eye chart that can be recognized at a given distance

vision impaired: persons who have some difficulty seeing with one or two eyes even when wearing glasses

vitreous body: transparent, colorless mass of soft, gelatinous material filling the globe of the eye between the lens and the retina

Methods and Sources

In 2001, a consensus meeting was convened by the National Eye Institute at which many of the world's leading ophthalmic epidemiologists created standard case definitions for the eye conditions included in this report. Data was obtained from a review of the major epidemiological studies with the cooperation of their authors (see Table of Sources below).

The number of individuals with each disease and the total number at risk were provided in five-year age increments by race and sex for the adult population from each of the studies. These age, race and sex-specific prevalence rates were then combined using a meta-analysis technique for reducing the overall variance of the pooled rate. Appropriate logistic regression models were fit to the age, race and sex-specific pooled prevalence rates. These models were applied to the state level U.S. Census 2000 populations for each year of age to arrive at the number of individuals with disease by race and sex for each state. The state-level prevalence rates were then derived by dividing the number of individuals with disease in each state by the total population in each state. To estimate the prevalence of disease in the "other" race category, the age and sex-specific rates for Whites, Blacks and Hispanics were averaged, then logistic regression models were developed based on these averages.

While the methods used in this report are similar to those used in previous editions of *Vision Problems in the U.S.*, there are minor differences. Changes in statistical techniques and significantly broader source data have resulted in the most accurate estimates Prevent Blindness America has ever produced. For these reasons, however, direct comparisons between current and previous estimates are inappropriate.

Obtaining an actual count of the number of eye disease cases in America would be virtually impossible. While these estimates do not represent exact measurements, they provide the best available information on the scope of the most serious threats to good vision for American adults in the 21st century.

Table of Sources

| Study | Location | Eye Condition | | | | | |
|---|---------------------------|---------------|-----|-----|----------|-----|----------|
| | | B/VI | R/E | AMD | Cataract | D/R | Glaucoma |
| Baltimore Eye Survey | Baltimore, MD | B W | B W | B W | | | B W |
| Barbados Eye Study | Barbados, West Indies | | | B | B | B | |
| Beaver Dam Eye Study | Beaver Dam, WI | W | W | W | W | W | W |
| Blue Mountains Eye Study | Blue Mountains, Australia | W | | W | W | W | W |
| Kongwa Eye Survey | Kongwa, Tanzania | | | | | | B |
| Proyecto Ver | Tucson, AZ | H | H | | | H | H |
| Rotterdam Study | Rotterdam, Netherlands | W | W | W | | | W |
| Salisbury Eye Evaluation Project | Salisbury, MD | B W | | B W | B W | | |
| San Antonio Heart Study | San Antonio, TX | | | | | H W | |
| San Luis Valley Diabetes Study | San Luis Valley, CO | | | | | H W | |
| Visual Impairment Project | Melbourne, Australia | W | | W | W | W | W |
| Wisconsin Epidemiologic Study of Diabetic Retinopathy | Madison, WI | | | | | W | |

Primary prevalence rate source for: B = Blacks, W = Whites, H = Hispanics
 B/VI = blindness and vision impairment, R/E = refractive errors, AMD = age-related macular degeneration,
 D/R = diabetic retinopathy

The Tables in this 2008 Update to the Fourth Edition of *Vision Problems in the U.S.* were updated using revised prevalence numbers from a meta-analysis of multiple smaller studies of blindness and vision impairment published in a special issue on blindness in the *Archives of Ophthalmology* in 2004. The population numbers were also updated using the 2004 census estimates of the U.S. population.

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