

Vision Problems in the U.S.

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



2008 Update to the Fourth Edition

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.

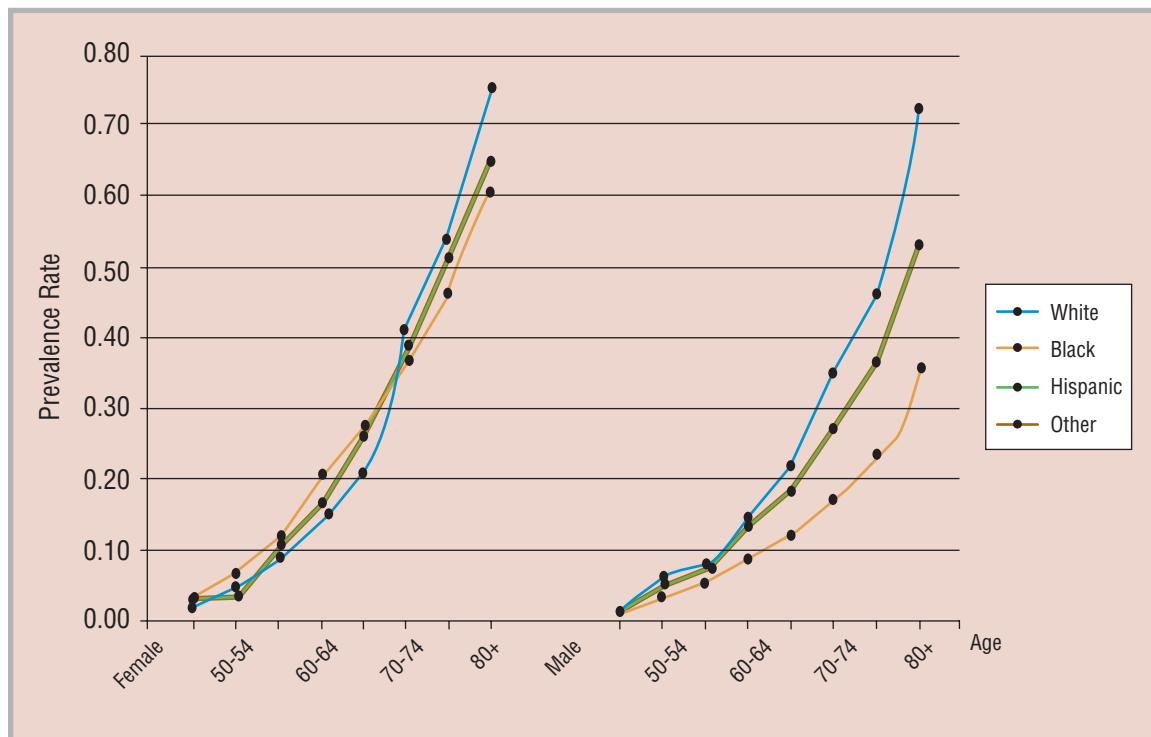
Because of the variety of opacifications possible, cases of cataract can be defined by a number of classification schemes. The cases included in the

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

Acknowledgements

Funding for *Vision Problems in the U.S.* and the 2008 Update to the Fourth Edition, was provided through a subcontract from the National Eye Institute, National Institutes of Health, and the U.S. Department of Health and Human Services.

Research described in this report was conducted by dozens of scientists from all over the world. We gratefully acknowledge the invaluable contribution of data from their work.

Prevalence estimates for *Vision Problems in the U.S.* were created under a grant from Prevent Blindness America to Johns Hopkins University. We offer our appreciation to the investigators:

Principal Investigator **David S. Friedman, MD, MPH**
Assistant Professor of Ophthalmology
Wilmer Eye Institute
Johns Hopkins University

Co-investigators **Nathan Congdon, MD, MPH**
Assistant Professor of Ophthalmology
Wilmer Eye Institute
Johns Hopkins University

John Kempen, MD, PhD
Assistant Professor of Ophthalmology
Wilmer Eye Institute
Johns Hopkins University

James M. Tielsch, PhD
Professor
Bloomberg School of Public Health
Johns Hopkins University

Dr. Tielsch also serves on the board of directors of Prevent Blindness America and was project leader for this publication.

The investigators were assisted by staff at ORC Macro International, including:

Benita J. O'Colmain, MPH, PhD
Wanda Parham, MPA
Arlen Rosenthal, MA
Adrienne Y. Semidey, MA
Sandra Townsend
Ceres Wright, BS

Text written by **John A. Shoemaker**

2008 Updates to the Fourth Edition provided by:

Kevin D. Frick, PhD Associate Professor Bloomberg School of Public Health Johns Hopkins University	Christine S. Spencer, ScD Associate Professor School of Public Affairs University of Baltimore
--	--

Cover design
donated by **Saatchi & Saatchi Healthcare**

Illustrations **Soumya Netrabile**



National Eye Institute
2020 Vision Place
Bethesda, MD 20892-3655
(301) 496-5248
www.nei.nih.gov



Prevent Blindness America
211 West Wacker Drive
Suite 1700
Chicago, Illinois 60606
800-331-2020
www.preventblindness.org