

Statistics on Vision Impairment: A Resource Manual

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INTRODUCTION

Statistics on vision impairment are available from a number of sources and/or agencies, depending upon the information needed. The purpose for developing this document was to pull together commonly requested statistics so the reader can easily find answers to many frequently asked questions about vision impairment.

In obtaining the statistics included in this manual, the most recent and clearly defined statistics were used whenever possible. Users should note that estimates may vary depending upon the definitions used, specific age groups included and the method of data collection employed. Therefore, while this document attempts to use consistent statistics regarding definitions and populations to which the estimates apply, this is not always possible (e.g., some data is based on only persons age 45 and over, while different sources need to be used for younger age groups).

The statistics included in this manual were gathered from a variety of different sources and should be cited accordingly using the reference list provided. When available, the actual source and date of the information is also included in addition to the publication information.

FREQUENTLY ASKED QUESTIONS

How many people of all ages have a vision impairment?

National estimates for the overall prevalence of vision impairment vary, depending upon the definition utilized.

- ❖ An estimated 7.9 million persons (age 6 and older) have difficulty seeing words and letters in ordinary newspaper print, even when wearing glasses or contact lenses (McNeil, 2001).
- ❖ Approximately 8.3 million persons of all ages (3.1%) are "blind in one or both eyes or report some other trouble seeing" (Adams, Hendershot, & Marano, 1999).

How many middle aged and older adults report some form of vision problem?

- ❖ One in six Americans (17%), 45 years of age or older, representing 16.5 million middle-age and older adults, report some form of vision impairment even when wearing glasses or contact lenses (The Lighthouse Inc., 1995).
- ❖ The prevalence of self-reported vision impairment increases with age. The following report some form of vision impairment: 15% (9.3 million) Americans age 45-64 years; 17% (3.1 million) age 65-74 years and 26% (4.3 million) age 75 years and older (The Lighthouse Inc., 1995).
- ❖ Among persons age 65 and older, 21% report some form of vision impairment (The Lighthouse Inc., 1995). Based on 2000 population estimates, this represents 7.3 million persons.
- ❖ The vast majority of middle-aged and older Americans who report vision impairment are partially sighted rather than totally blind. Only 2% of all Americans age 45 and older report that they are blind in both eyes (The Lighthouse Inc., 1995).

What is the prevalence of vision impairment among persons under age 45?

- ❖ Nationally, 1.7% of persons under age 45 (3 million) self-report a visual impairment, defined as *blindness in one or both eyes or any other reported trouble seeing even when wearing glasses or contact lenses* (Adams, Hendershot, & Marano, 1999; Estimates from the National Health Interview Survey, 1996).

How many children in the U.S. have a vision impairment?

- ❖ Based on data from the 1996 National Health Interview Survey, less than 1% (0.6%) of persons under the age of 18 are visually impaired, defined as *blindness in one or both eyes, or any other trouble seeing even when wearing glasses*, representing 448,000 children and youths (Adams, Hendershot, & Marano, 1999).

How many people in the U.S. have a severe vision impairment?

- ❖ An estimated 1.8 million persons age 6 and older (0.7%) have a severe vision impairment, defined as an inability to see words and letters in ordinary newspaper print, even when wearing glasses or contact lenses (McNeil, 2001).
- ❖ Based on data collected from The Lighthouse National Survey, 8.7 million (9%) Americans age 45 and older report a severe vision impairment, defined as *an inability to recognize a friend at arm's length even when wearing glasses or contact lenses, or cannot read ordinary newspaper print even when wearing glasses or contact lenses, or reports poor or very poor vision even when wearing glasses or contact lenses, or is blind in both eyes* (The Lighthouse Inc., 1995).

How many people potentially have low vision?

- ❖ More than 3 million Americans have low vision (National Advisory Eye Council, 1998).
- ❖ It is also estimated that approximately 12 million people have some form of vision impairment that cannot be corrected by glasses (National Advisory Eye Council, 1998).

How many people in the U.S. are legally blind?

- ❖ Data collected from the National Health Interview Survey on Disability (1994-95) indicate that approximately 1.3 million persons reported legal blindness (0.5%). (cited in American Foundation for the Blind, 2001)

How many people in the U.S. have light perception or less?

- ❖ An estimated 20% of legally blind individuals have *clinically measured light perception or less*, representing an estimated 260,000 individuals (American Foundation for the Blind, 2001).

How many people worldwide have a vision impairment?

- ❖ There is an estimated 180 million people worldwide who have a visual impairment. Of these, between 40 and 45 million persons are blind (World Health Organization, 2001).

What is the employment status of persons who have a visual impairment?

- ❖ Nationally, among persons age 21 to 64 who are visually impaired, *defined as any difficulty or inability to see words and letters even when wearing glasses or contact lenses*, only 41.5% are employed; among individuals *unable to see words and letters*, this figure decreases to 29.9%. (McNeil, 2001). This proportion is significantly lower than the approximately 84% of persons without any disability, or the 50% with any type of disability in this age group who are employed (McNeil, 2001).
- ❖ According to data collected from the National Health Interview Survey on Disability, 40-45% of working age people who have a vision impairment (serious difficulty seeing even with glasses or contact lenses) or are legally blind are employed (cited

in American Foundation for the Blind, 2001).

What are the leading causes of blindness?

- ❖ The leading causes of existing cases of blindness are: glaucoma, macular degeneration, cataract, optic nerve atrophy, diabetic retinopathy and retinitis pigmentosa. These causes account for 51% of all cases of blindness (National Society to Prevent Blindness, 1980).

PREVALENCE OF VISION IMPAIRMENT: NATIONAL ESTIMATES

ALL AGES

Self-Reported Visual Impairment & Low Vision

- ❖ Based on data from the 1996 National Health Interview Survey, some degree of vision impairment, defined as *blindness in one or both eyes or any other reported trouble seeing*, affects 8.3 million (3.1%) Americans of all ages. (Adams, Hendershot, & Marano, 1999).
- ❖ Approximately 3% of individuals age 6 and older, representing 7.9 million people, have *difficulty seeing words and letters in ordinary newspaper print even when wearing glasses or contact lenses*. This number increases to 12% among persons age 65 and older (3.9 million) (McNeil, 2001).
- ❖ It is estimated that there are more than 3 million people with low vision (National Advisory Eye Council, 1998).
- ❖ About 12 million people have some degree of visual impairment that cannot be corrected by glasses (National Advisory Eye Council, 1998).

Severe Vision Impairment

- ❖ An estimated 1.8 million individuals age 6 and older (0.7%) are unable to see words and letters in ordinary print even when wearing glasses or contact lenses (McNeil, 2001).

Legal Blindness

- ❖ Data collected from the National Health Interview Survey on Disability (1994-95) indicate that approximately 1.3 million persons reported legal blindness (0.5%) (cited in American Foundation for the Blind, 2001).

Light Perception or Less

- ❖ An estimated 20% of legally blind individuals have *light perception or less* representing an estimated 260,000 individuals (American Foundation for the Blind, 2001).

MIDDLE AGE AND OLDER ADULTS

The following estimates are based on findings from The Lighthouse National Survey on Vision Loss (The Lighthouse Inc., 1995). Vision impairment is defined as follows, based on self-reports:

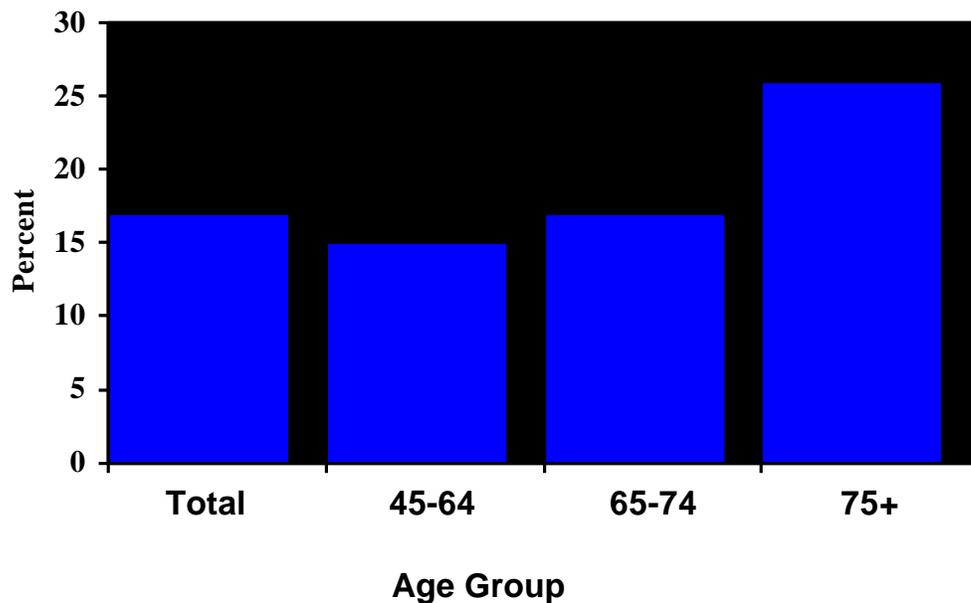
- ◆ Inability to recognize a friend across the room, even when wearing glasses or contact lenses; OR
 - ◆ Inability to read regular newspaper print, even when wearing glasses or contact lenses; OR
 - ◆ Self-rated vision as poor or very poor even when wearing glasses or contact lenses; OR
 - ◆ Report of some other trouble seeing, even when wearing glasses or contact lenses; OR
 - ◆ Blindness in one or both eyes.
- ❖ One in six Americans (17%) age 45 years of age or older, representing 16.5 million middle-age and older adults, report some form of vision impairment even when wearing glasses or contact lenses.

The prevalence of vision impairment increases with age as indicated in the following estimates:

- ❖ 15% of Americans age 45-64 years report some form of vision impairment, representing 9.3 million persons.
- ❖ 17% of Americans age 65-74 years and older report some form of vision impairment, representing 3.1 million persons.
- ❖ 26% of Americans age 75 years and older report some form of vision impairment, representing 4.3 million persons.
- ❖ Among persons age 65 and older, an estimated 21% report some form of vision impairment, representing 7.3 million persons.

[Note percentages have been applied to Census 2000 population estimates to arrive at the number of persons reporting vision problems.]

Figure 1
Percent of Americans age 45+ with a Self-Reported Vision Problem by Age



Source: Lighthouse National Survey on Vision Loss (1995)

- ❖ The vast majority of middle-aged and older Americans who report vision impairment are partially sighted rather than totally blind. Only 2% of all Americans age 45 and older report that they are blind in both eyes.

Severe Vision Impairment

- ❖ Approximately 8.7 million Americans age 45 and older (9%) report a severe vision impairment. Severe vision impairment is defined as follows, based on self-report:
 - ◆ Unable to recognize a friend at arm's length even when wearing glasses or contact lenses; OR
 - ◆ Cannot read ordinary newspaper print even when wearing glasses or contact lenses, OR
 - ◆ Self-rated vision as poor or very poor vision even when wearing glasses or contact lenses; OR
 - ◆ Blind in both eyes.
- ❖ Approximately 11% of people age 65 and older (3.8 million) report a severe vision impairment as defined above.

ESTIMATES BASED ON VISUAL ACUITY:

Visual Impairment

- ❖ Approximately 2.4 million Americans age 40 years and older have a *best corrected visual acuity of worse than 20/40 but better than 20/200 in the better eye* (Prevent Blindness America, 2002*).
- ❖ An estimated 3.4 million Americans age 40 years and older have a *best corrected visual acuity of worse than 20/40 in the better eye* (Prevent Blindness America, 2002*).

Legal Blindness

[Note: different data sources are used depending upon age group of interest.]

- ❖ More than one million Americans age 40 and older are legally blind (*clinically measured visual acuity with best correction in the better eye worse than or equal to 20/200 or a visual field of less than 20 degrees*) (Prevent Blindness America, 2002*).
- ❖ Among individuals age 65 and older, approximately 713,000 are legally blind (*clinically measured visual acuity of 20/200 or less*) (Chiang, Bassi, & Javitt, 1992).

*NOTE: Original source provides data for each state.

PERSONS UNDER AGE 45

- ❖ Nationally, 1.7% of persons under age 45 (3 million) self-report a visual impairment, defined as *blindness in one or both eyes or any other reported trouble seeing even when wearing glasses or contact lenses* (Adams, Hendershot, & Marano, 1999).

YOUNG & WORKING AGE ADULTS

Visual Impairment

- ❖ Among young adults age 18-44, 2.4% or 2.6 million persons report a visual impairment defined as *blindness in one or both eyes or any other reported trouble seeing even when wearing glasses or contact lenses* (Adams, Hendershot, & Marano, 1999).

- ❖ Among working age adults age 21-64, an estimated 3.7 million report having *difficulty seeing words and letters in ordinary newsprint even when wearing glasses or contact lenses*. Of these 3.7 million working age adults, 669,000 are unable to see words and letters in ordinary newsprint even when wearing glasses or contact lenses (McNeil, 2001).

Legal Blindness

- ❖ An estimated 163,000 Americans age 20-44, and 174,000 age 45-64 are legally blind (Chiang, Bassi, & Javitt, 1992).

Leading Cause of Vision Loss

- ❖ According to the American Diabetes Association, diabetes is the leading cause of blindness in persons age 20-74. An estimated 12,000 to 24,000 people lose their sight each year because of diabetes.

COLLEGE POPULATION

- ❖ Findings from the National Longitudinal Transition Study (NLTS) indicate that 57% of youth with visual impairments had attended postsecondary schools in comparison to 68% of the general population and only 27% of persons with disabilities overall (Blackorby & Wagner, 1996).

The following estimates are from the American Council on Education; HEATH Resource Center (Henderson, 1999).

- ❖ Based on a 1998 survey of college freshman, 1.1% of all full-time freshmen report being "partially sighted" or "blind".
- ❖ Of college freshmen with any kind of disability, 13.3% report being "partially sighted" or "blind" - a decline from 31.7% reported a decade ago and 22.0% just two years earlier.

CHILDREN & ADOLESCENTS

Visual Impairment

- ❖ Based on data from the 1996 National Health Interview Survey less than 1% (0.6%) of persons under the age of 18 are visually impaired, defined as *blindness in one or both eyes, or any other trouble seeing even when wearing glasses*, representing 448,000 children and youths (Adams, Hendershot, & Marano, 1999).

Severe Visual Impairment

- ❖ Based on data from the Survey of Income and Program Participation (1997), 264,000 children 6-14 years of age have difficulty seeing words and letters in ordinary newsprint even when wearing glasses or contact lenses. Of those, 45,000 have a severe vision impairment (unable to see words and letters in ordinary newspaper print), and 219,000 have a non-severe vision impairment (McNeil, 2001).

Legal Blindness

- ❖ In 1990, data on legal blindness indicated that approximately 2,600 children under 5 years of age and approximately 51,000 between the ages of 5-19 were legally blind (Chiang, Bassi, & Javitt, 1992).

Causes of Blindness Among Children

- ❖ Among children under 5 years of age, prenatal cataract is the leading cause of legal blindness, accounting for 16% of all cases. This is followed by optic nerve atrophy (12% of all cases) and retinopathy of prematurity (9% of all cases) (National Society to Prevent Blindness, 1980).
- ❖ Blindness occurs mainly among children with birth weights below 1,000 grams (2 lbs, 3 oz) at rates of 5% to 6% (Hack, Klein, & Taylor, 1995).
- ❖ Retinopathy of Prematurity (ROP) is the leading cause of blindness among premature infants in developed, and rapidly developing, countries (World Health Organization, 1997a).

Education

- ❖ According to the State reported data to the Office of Special Education Programs, 26,070 students age 6-21 received vision services under IDEA during the 1997-1998 school year (U.S. Department of Education, 1999).
- ❖ Among students who have disabilities, students with sensory impairments are the most likely to graduate from secondary school with 73% of those with visual impairments doing so (based on data from the 1993-1994 school year (Kaye, 1997).

World-Wide Estimates

- ❖ An estimated 1.4 million children (age 14 and under) in the world are classified as blind, defined as a corrected visual acuity in the better eye of less than 3/60 or a corresponding visual field loss in the better eye with best possible correction (Thylefors, Négrel, Pararajasegaram, & Dadzie, 1995).
- ❖ World-wide, vitamin A deficiency is the leading cause of childhood blindness, responsible for an estimated 70% of the 500,000 children who become blind each year (Thylefors, Négrel, Pararajasegaram, & Dadzie, 1995).

NURSING HOME RESIDENTS

- ❖ According to studies using clinical measures to examine the prevalence of vision impairment among nursing home residents, estimates of vision impairment range from 21% to 52% (Morse, O'Connell, Joseph, & Finkelstein, 1988; Marx, Feldman, Werner, & Cohen-Mansfield, 1994; Horowitz, Balistreri, Stuen, & Fangmeier, 1995).
- ❖ Based on findings from the 1997 National Nursing Home Survey, 27% of nursing home residents age 65 and older (N=396,700) have a vision impairment (Gabrel, 2000).

PREVALENCE OF VISION IMPAIRMENT: STATE ESTIMATES

Limited data exists on vision impairment for each state, however the resources provided below may be useful in determining the extent of vision loss in a particular state.

Table 1 (pages 9-10)

Estimates of vision loss among persons age 65 and older are based on data collected from the Lighthouse National Survey on Vision Loss (The Lighthouse Inc., 1995). In order to determine the number of persons reporting vision problems in each state, national percentages were applied to Census 2000 population estimates for each state (U.S. Census Bureau, 2001).

Note: These estimates are only intended to provide an approximation of self-reported vision impairment in each state based on national estimates; they do not take into account differences between states (e.g., population age, race, access to health care) that could affect individual state estimates.

Vision impairment is defined as follows, based on self-reports:

- ◆ Inability to recognize a friend across the room, even when wearing glasses; OR
Inability to read regular newspaper print, even when wearing glasses; OR
- ◆ Self-rated vision as poor or very poor, even when wearing glasses; OR
- ◆ Report of some other trouble seeing, even when wearing glasses; OR
- ◆ Blindness in one or both eyes

Additional Sources of State Estimates

- ❖ Estimates of vision impairment and severe vision impairment among persons age 16 and older for each state are available from the U.S. Census Bureau (2000). Data are based on 1990 Census estimates. Unfortunately, more recent data for each state is not available. These data can be obtained from Table 3 on the following website:
<http://www.census.gov/hhes/www/disable/census/disapick.html>

Vision impairment is defined as difficulty seeing words and letters in ordinary newsprint, even when wearing glasses or contact lenses.

- ❖ State estimates of vision impairment (based on visual acuity) among persons age 40 and older are available from Prevent Blindness America (2002). Data can be found on the following website: <http://www.preventblindness.org/vpus/vp.html>

Table 1
Self-Reported Vision Problems among Persons age 45+ and 65+ by State

State	45 +		65+	
	2000 Population	Self-reported vision problem (17%)	2000 Population	Self-reported vision problem (21%)
Alabama	1,595,539	271,242	579,798	121,758
Alaska	175,401	29,818	35,699	7,497
Arizona	1,738,115	295,480	667,839	140,246
Arkansas	980,321	166,655	374,019	78,544
California	10,541,386	1,792,306	3,595,658	755,088
Colorado	1,369,505	232,816	416,073	87,375
Connecticut	1,259,603	214,133	470,183	98,738
Delaware	277,244	47,131	101,726	21,362
D. C.	194,991	33,148	69,898	14,679
Florida	6,436,062	1,094,131	2,807,597	589,595
Georgia	2,526,723	429,543	785,275	164,908
Hawaii	438,541	74,552	160,601	33,726
Idaho	423,693	72,028	145,916	30,642
Illinois	4,167,400	708,458	1,500,025	315,005
Indiana	2,099,540	356,922	752,831	158,095
Iowa	1,086,419	184,691	436,213	91,605
Kansas	930,629	158,207	356,229	74,808
Kentucky	1,434,320	243,834	504,793	106,007
Louisiana	1,482,248	251,982	516,929	108,555
Maine	499,185	84,861	183,402	38,514
Maryland	1,824,715	310,202	599,307	125,854
Massachusetts	2,279,922	387,587	860,162	180,634
Michigan	3,449,996	586,499	1,219,018	255,994
Minnesota	1,664,831	283,021	594,266	124,796
Mississippi	951,327	161,726	343,523	72,140

State	45+		65+	
	2000 Population	Self-reported vision problem (17%)	2000 Population	Self-reported vision problem (21%)
Missouri	2,005,239	340,891	755,379	158,630
Montana	341,156	57,997	120,949	25,399
Nebraska	599,489	101,913	232,195	48,761
Nevada	678,178	115,290	218,929	45,975
New Hampshire	441,615	75,075	147,970	31,074
New Jersey	3,026,018	514,423	1,113,136	233,759
New Mexico	616,796	104,855	212,225	44,567
New York	6,689,275	1,137,177	2,448,352	514,154
North Carolina	2,777,910	472,245	969,048	203,500
North Dakota	233,342	39,668	94,478	19,840
Ohio	4,083,047	694,118	1,507,757	316,629
Oklahoma	1,226,040	208,427	455,950	95,749
Oregon	1,249,720	212,452	438,177	92,017
Pennsylvania	4,755,822	808,490	1,919,165	403,025
Rhode Island	383,254	56,153	152,402	32,004
South Carolina	1,408,565	239,456	485,333	101,920
South Dakota	268,162	45,588	108,131	22,708
Tennessee	2,023,478	343,991	703,311	147,695
Texas	6,281,859	1,067,916	2,072,532	435,232
Utah	570,440	96,975	190,222	39,947
Vermont	228,262	38,805	77,510	16,277
Virginia	2,423,200	411,944	792,333	166,390
Washington	2,004,700	340,799	662,148	139,051
West Virginia	732,177	124,470	276,895	58,148
Wisconsin	1,892,600	321,742	702,553	147,536
Wyoming	176,362	29,982	57,693	12,116

WORLDWIDE PREVALENCE OF VISION IMPAIRMENT

- ❖ There are an estimated 180 million persons worldwide who are visually impaired. Of these, between 40 and 45 million persons are blind (World Health Organization, 2001).
- ❖ It is estimated that at least 7 million people in world become blind each year, with over 70% having vision restored with treatment. Therefore, the number of blind people worldwide is increasing by up to 2 million per year (World Health Organization, 1997b).
- ❖ Among persons who are blind worldwide:
 - 58% are age 60+
 - 32% are age 45-59
 - 7% are age 15-44
 - 4% are age 14 or under(Thylefors, et al., 1995).
- ❖ It is projected that by the year 2020, there will be about 54 million blind persons age 60+ worldwide (if no additional resources become available) (World Health Organization, 1997b).

Causes of Vision Impairment & Blindness

- ❖ According to Prevent Blindness America (1994), cataract is the leading cause of blindness in the world.

The following estimates are from the World Health Organization (1997c).

- ❖ It is estimated that, depending on the cause, up to 80% of blindness and serious vision loss could be avoided (prevented or treated).
- ❖ The major causes of avoidable vision loss are: cataract, trachoma, and glaucoma. Together, they account for more than 70% of the world's blindness.
- ❖ Cataract accounts for an estimated 16 million cases of blindness worldwide; it accounts for approximately 1/2 of all cases in most countries of Africa and Asia.
- ❖ Trachoma, the 2nd leading cause of blindness worldwide is the cause of 15% of all blindness worldwide. There are an estimated 6 million persons with irreversible blindness due to trachoma and 146 million with active cases in need of treatment.
- ❖ Glaucoma is the 3rd leading cause of blindness worldwide and is responsible for about 5.2 million cases of blindness. Estimates of the number of persons

worldwide who have glaucoma range from 67 million (The Glaucoma Foundation, 2001) to about 105 million "suspect" cases of glaucoma (World Health Organization, 1997c).

Other Leading Causes of Blindness (World Health Organization, 1997d).

- ❖ "River Blindness" or onchocerciasis accounts for approximately 270,000 cases of blindness worldwide - almost 99% of these cases are in Africa.
- ❖ Diabetic retinopathy is the leading cause of blindness and visual impairment in economically developed societies.
- ❖ Macular degeneration is the most common non-avoidable cause of vision impairment. It is estimated that about 8 million persons worldwide are blind or severely visually impaired due to macular degeneration.

Children

- ❖ Worldwide, approximately 1.4 million children age 0-14 years are blind, defined as *a corrected visual acuity in the better eye of less than 3/60* (Thylefors, Négrel, Pararajasegaram, & Dadzie, 1995).

PROJECTED ESTIMATES OF VISION IMPAIRMENT

- ❖ According to Prevent Blindness America, twice as many people will be blind in 2030 as there are today (Prevent Blindness America, 1998-2000).

The following projections are based on estimates of self-reported vision impairment from The Lighthouse National Survey on Vision Loss (The Lighthouse Inc., 1995) and applied to US Census population projections.

- ❖ 17% of persons age 45 and older report some form of vision impairment, representing 16.5 million persons. By the year 2010, when all baby boomers are age 45 and older, this number will increase to 20 million.
- ❖ 9% of persons age 45 and older report a severe vision impairment, representing 8.7 million persons. By the year 2010, when all baby boomers are age 45 and older, this number will increase to 10.7 million.
- ❖ About 7.3 million, or 21% of persons age 65 and over, report some form of vision impairment. As baby boomers age, this number will reach 8.3 million in the year 2010, 11.3 million in 2020, and in 2030, 14.8 million persons age 65 and older will report some form of vision loss.
- ❖ About 3.8 million, or 11% of persons age 65 and over report a severe vision impairment. As baby boomers age, this number will reach 4.3 million in the year 2010, 5.9 million in 2020, and in 2030, 7.7 million persons age 65 and older will report a severe vision impairment.

Vision impairment is based on self-report and is defined on page 2.

Severe vision impairment is based on self-report and is defined on page 3.

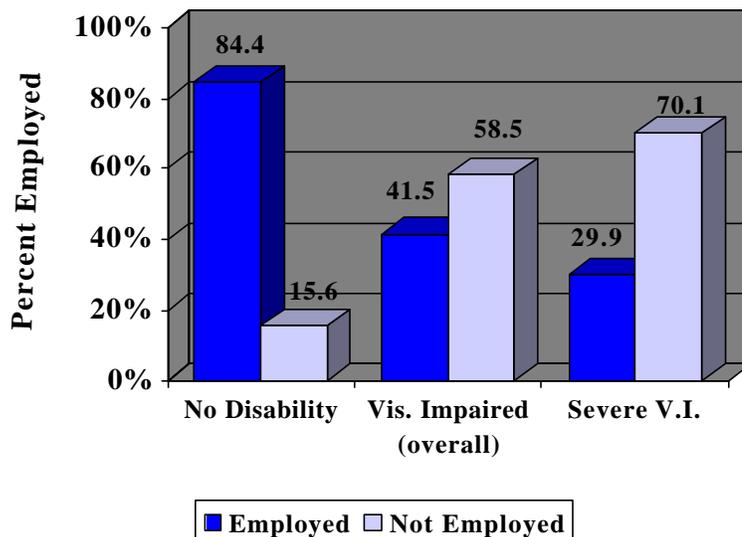
EMPLOYMENT STATUS & EARNINGS OF WORKING AGE PERSONS WITH VISUAL IMPAIRMENTS

Data on the employment status of persons with visual impairments presented in this document was obtained from two sources: the Survey of Income and Program Participation (SIPP), and the National Health Interview Survey on Disability (NHIS-D). Please note each source uses a different definition of vision impairment and includes different age categories of working age adults.

Data From the Survey of Income and Program Participation

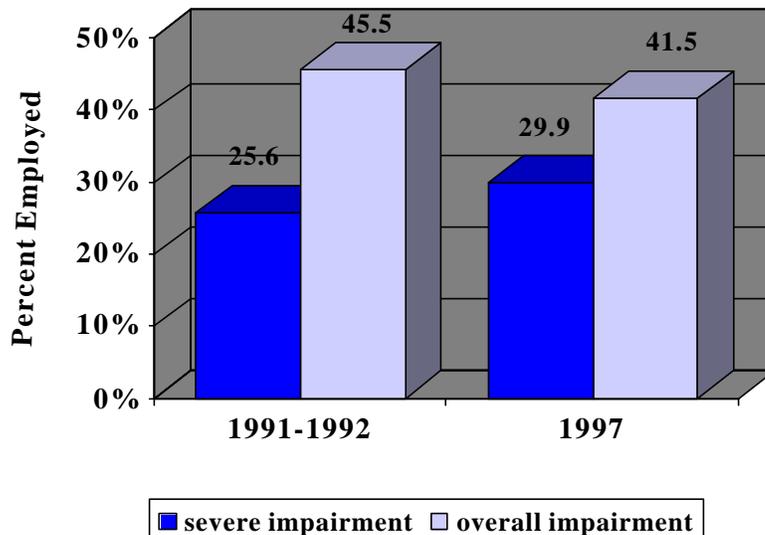
- ❖ Nationally, among persons age 21 to 64 who have a visual impairment (*defined as difficulty or inability to see words and letters in ordinary newspaper print even when wearing glasses or contact lenses*), only 41.5% are employed; among individuals *unable to see words and letters*, this figure decreases to 29.9%. This proportion is significantly lower than the estimated 84% of persons in this age group without any kind of disability who were employed (Figure 2) (McNeil, 2001).

Figure 2
Employment Status Among Persons age 21-64
with and without a Visual Impairment, 1997



- ❖ An examination of data collected from the Survey of Income and Program Participation 1991-1992 and 1997 indicate an increase in the proportion of persons with a *severe vision impairment* who are employed (Figure 3). During 1997, 29.9% of persons with a severe vision impairment were employed, in comparison to 25.6% in 1991-1992. However, the proportion of persons with a *vision impairment* overall who are working decreased slightly from 1991-1992 to 1997 (45.5% and 41.5% employed, respectively) (McNeil, 1993; McNeil, 2001).

Figure 3
Percentage of Persons with a vision impairment who are Employed 1991-1992 v. 1997



- ❖ Results of the National Longitudinal Transition Study indicate that only 29% of the youths with visual impairments (between the ages of 16 and 21 years) were competitively employed 3-5 years following secondary school. This figure can be compared to 57% of youths with disabilities overall and 69% of youth in general who are employed (Blackorby & Wagner, 1996).

Average Annual Earnings

- ❖ Average annual earnings of individuals with visual impairments are about 31% lower than those earned by persons without disabilities (\$21,559 versus \$31,053) and persons who are severely visually impaired report average yearly incomes that are approximately 37% lower than those earned by persons without disabilities (\$19,714 versus \$31,053) (McNeil, 2001).

- ❖ Working-age adults with visual impairments also earn annual incomes that are about 8% lower than those earned by persons with any type of disability (\$21,559 versus \$23,373) (McNeil 2001).

Data from the National Health Interview Survey on Disability

The following estimates were compiled by the American Foundation for the Blind (2001).

- ❖ According to data collected from the National Health Interview Survey on Disability, 40-45% of people age 18 to 69 years who have a vision impairment (serious difficulty seeing even with glasses or contact lenses) or are legally blind are employed.
- ❖ An estimated 30% of legally blind persons age 18 to 69 years of age are employed.
- ❖ Not including persons who are legally blind, 45% of individuals age 18 to 69 who have a visual impairment (serious difficulty seeing even with glasses or contact lenses) are employed.

DISABILITY ESTIMATES

Impact of Impaired Vision

- ❖ Based on findings from the Lighthouse National Survey on Vision Loss, one-half of all people with impaired vision age 45 and older report that their vision problem interferes to some degree with what they want to do in their daily lives (The Lighthouse Inc. 1995).

Furthermore, the Lighthouse National Survey on Vision Loss also found:

- ◆ 24% reported that their vision problem causes at least some difficulty managing daily household tasks;
 - ◆ 18% reported some difficulty getting to places outside the home because of vision problem;
 - ◆ 38% reported at least some interference with their leisure activities.
-
- ❖ Visual impairment has been identified as one of the four most significant contributors to lost independence among older Americans (Alliance for Aging Research, 1999).

Activity Limitation

- ❖ Blindness in both eyes causes activity limitation for 332,000 people and visual impairment in both eyes limits 527,000 people (LaPlante & Carlson, 1996, p. 18).
- ❖ Considering all the conditions reported to cause activity limitation, vision impairment (blindness and low vision) ranks 11th, limiting the activities of 1.3 million (LaPlante & Carlson, 1996, p.43).

CAUSES OF VISION IMPAIRMENT

The following estimates are from Prevent Blindness America (National Society to Prevent Blindness, 1980) and reflect 1978 estimates. While these estimates are not recent, they are the only comprehensive statistics which could be located which indicate the percentage of all cases of blindness accounted for by each disease (for all ages and ethnic groups).

Existing Cases of Legal Blindness

(Based on the number of legally blind persons in the population at a given time).

- ❖ The leading causes of existing cases of legal blindness and the percentage of cases of legal blindness caused by each are as follows:
 - glaucoma (12.5)
 - macular degeneration (11.7)
 - cataract (8.3%)
 - optic nerve atrophy (7.0)
 - diabetic retinopathy (6.6)
 - retinitis pigmentosa (RP) (4.7)
 - myopia (4.0)
 - all other/unknown (45.2)

New Cases of Legal Blindness

(New cases of legal blindness which occur during the year)

- ❖ The leading causes of new cases of legal blindness and the percentage of cases of legal blindness caused by each are as follows:
 - macular degeneration (16.8%)
 - glaucoma (11.5%)
 - diabetic retinopathy (10.1%)
 - cataract (9.8%)
 - optic nerve atrophy (4.3%)
 - all other/unknown (47.5%)

MACULAR DEGENERATION

- ❖ Age-related macular degeneration is the leading cause of visual impairment among persons age 75 and older. It is the most common cause of new cases of visual impairment among those over age 65 (Prevent Blindness America, 1998-2000).
- ❖ More than 1.6 million people age 50 and over in the U.S. have late age-related macular degeneration (involving geographic atrophy or neovascularization) (Prevent Blindness America, 2002).
- ❖ An estimated 5% of people age 65 and older in the U.S. have some visual impairment as a result of macular degeneration (National Advisory Eye Council, 1993). Based on 2000 population estimates, this represents approximately 1.7 million older persons.
- ❖ As the U.S. population ages, more elderly persons will become blind from macular degeneration than from glaucoma and diabetic retinopathy combined (National Advisory Eye Council, 1998, p.14).
- ❖ Conservatively, it is estimated that approximately 8 million persons worldwide are blind or severely visually impaired because of macular degeneration (World Health Organization, 1997d).

GLAUCOMA

- ❖ According to The Glaucoma Foundation (2001), approximately 3 million people in the U.S. have glaucoma, including 6% of those over the age of 65.
- ❖ Approximately 2.2 million Americans (1.9%) age 40 and older, have glaucoma (Prevent Blindness America, 2002).
- ❖ About 163,000, or 2%, of persons age 40 and older in New York State have glaucoma (Prevent Blindness America, 2002).
- ❖ Glaucoma is the 3rd leading cause of blindness worldwide and is responsible for about 5.2 million cases of blindness. Estimates of the number of persons worldwide who have glaucoma range from 67 million (The Glaucoma Foundation, 2001) to about 105 million "suspect" cases of glaucoma (World Health Organization, 1997c).

Ethnic differences in the prevalence of glaucoma are evident as indicated in the following estimates:

- ❖ Almost 4% of Blacks (409,643) (age 40 and over) are reported to have glaucoma as compared to about 1.7% of Whites (1.6 million) and 1.5% of Hispanics (131,654) (Prevent Blindness America, 2002).
- ❖ Based on findings from the Baltimore Eye Survey, the prevalence of vision impairment due to glaucoma is four to six times higher among blacks than Caucasians (Tielsch, Sommer, Witt, Katz, & Royall, 1990).
- ❖ Research on a population-based sample found that glaucoma is the leading cause of blindness among Hispanics (Rodriguez, 2002).

CATARACT

NOTE: - A review of the available data revealed that prevalence estimates of cataract vary considerably among different sources. According to the National Advisory Eye Council, "Data on cataract blindness and cataract surgery provide incomplete information about the magnitude of the cataract problem. Large numbers of persons with visual impairments from cataract are not included in these data because their impairment is not sufficient to require surgical correction or to result in blindness" (1993, p. 156), or they may not be aware that they have the condition. Furthermore, as indicated by the Cataract Management Guideline Panel (1993), a problem in determining the prevalence of cataracts is the varying definitions used in the literature (e.g., presence of lens opacities; loss of visual acuity).

- ❖ According to Prevent Blindness America (1998-2000), cataracts are a leading cause of blindness among adults in the U.S., accounting for 1 out of 7 cases of blindness in people age 45 and older.

Estimates Based on Clinical Data:

- ❖ Cataract affects 20.5 million (1 in 6) Americans age 40 and older. By 80 years of age, more than one half of Americans have cataract (Prevent Blindness America, 2002).
- ❖ There appears to be a higher prevalence of cataracts among females. According to estimates of Americans age 40 and older, a higher proportion of females have cataracts (20%) as compared to males (14%) (Prevent Blindness America, 2002).
- ❖ In the Framingham Eye Study, cataract (defined as lens opacities accompanied by visual acuity of 20/30 or worse, including aphakics) was found in 5% of persons age 55-64, 18% of persons age 65-74, and 46% of persons age 75-84. Lens opacities (including aphakics) were found in 42% of persons age 55-64, 73% of persons age 65-74, and 91% of those 75-84 (Cataract Management Guideline Panel, 1993).
- ❖ The 1971-1972 National Health and Nutrition Examination Survey of the National Center for Health Statistics reported that 28.5% of persons 65-74 had lens opacities accompanied by a decrease in visual acuity (20/25 or worse). Lens opacities were present in 58% of persons in this age group (National Advisory Eye Council, 1993; Cataract Management Guideline Panel, 1993).

CATARACT - continued

Estimates Based on Self-Report

- ❖ Based on data from the 1996 National Health Interview Survey, 15% of persons between 65-74 (2.8 million) and 20% of persons ages 75 and older (2.7 million) self-report the presence of cataracts (Adams, Hendershot, & Marano, 1999).

Worldwide Estimates

- ❖ According to the World Health Organization (1997c), cataracts are the leading cause of blindness in the world.
- ❖ Cataract accounts for an estimated 16 million cases of blindness worldwide; it accounts for 1/2 of all cases in most countries of Africa and Asia (World Health Organization, 1997c).

Cost

- ❖ Cataract surgery is the most frequently performed surgical procedure among Medicare beneficiaries. Furthermore, among Medicare beneficiaries, cataract is the most common condition for which eyecare services are sought, accounting for 43 percent of visits to ophthalmologists and optometrists combined (National Advisory Eye Council, 1998, p. 60).
- ❖ In 1991, Medicare spent an estimated \$3.4 billion for 1.35 million episodes of cataract surgery (Agency for Health Care Policy and Research, 1993).

DIABETIC RETINOPATHY

- ❖ An estimated 17 million people in the U.S. have diabetes. Of those, 5.9 million are not aware that they have the disease (American Diabetes Association).
- ❖ Approximately 40% (6 million) of all people with diabetes have diabetic retinopathy. An estimated 5% of persons with diabetes have the sight-threatening form of this disease (Prevent Blindness America, 1994).
- ❖ An estimated 5.3 million Americans age 18 and older have diabetic retinopathy (2.5%) (Prevent Blindness America, 2002).
- ❖ Annually, 12,000 to 24,000 people lose their sight from diabetic retinopathy (American Diabetes Association).
- ❖ Diabetes is the leading cause of new cases of legal blindness among adults 20 to 74 years of age (American Diabetes Association).
- ❖ Among persons with juvenile diabetes, 25% will have diabetic retinopathy after 5 years; almost 60% after 10 years; and 80% after 15 years (Prevent Blindness America, 1994).
- ❖ African-Americans are twice as likely to suffer from diabetic-related legal blindness (American Diabetes Association).
- ❖ The prevalence of diabetic retinopathy in Mexican Americans is 32-40% (American Diabetes Association).

AIDS RELATED VISUAL IMPAIRMENT

- ❖ The estimated proportion of persons with AIDS who will develop CMV retinitis ranges from 20% (Jabs, Davis, & Mowyer, 1992) to approximately 40% (cited in Gallant, et al. (1992).

CANCER

- ❖ Retinoblastoma is the most common intraocular malignancy of childhood. There are between 300 and 400 new cases diagnosed annually (National Advisory Eye Council, 1998).
- ❖ Approximately 1,500 new cases of choroidal melanoma are diagnosed annually (National Advisory Eye Council, 1998).

CORNEAL DISEASE

- ❖ Diseases and injury to the cornea are the leading cause of visits to physicians for medical eye care in the United States (National Advisory Eye Council, 1998).

LOW BIRTH WEIGHT

- ❖ Blindness occurs mainly among children with birth weights below 1,000 grams (2 lbs, 3 oz) at rates of 5% to 6% (Hack, Klein, & Taylor, 1995).

RETINITIS PIGMENTOSA

- ❖ Retinitis pigmentosa is the most common cause of inherited blindness (National Advisory Eye Council, 1993).
- ❖ Retinitis pigmentosa, for which there is no known cure, affects 100,000 Americans (Foundation Fighting Blindness).
- ❖ An estimated one out of 80 people carry the recessive gene for RP (National Advisory Eye Council, 1993).

USHER SYNDROME

The following estimates are from Foundation Fighting Blindness:

- ❖ There are about 10-15,000 people with Usher syndrome.
- ❖ Usher Syndrome is the major cause of deaf-blindness.

REFRACTIVE ERRORS

- ❖ Myopia (nearsightedness) affects more than 30.5 million Americans age 40 and older (26%) (Prevent Blindness, 2002).
- ❖ Hyperopia (farsightedness) affects 12 million Americans age 40 and older (10%) (Prevent Blindness America, 2002).
- ❖ It is estimated that between 1% and 4% of the childhood population are affected by strabismus and 1% to 2% suffer from amblyopia (National Advisory Eye Council, 1993).
- ❖ In the United States, less than 2% of all children beginning school (age 5) are myopic. By the end of grade school (age 11 or 12) more than 15% are myopic. By adulthood, about 25% Americans are myopic thereby requiring some form of optical correction to see clearly beyond an arm's length (National Advisory Eye Council, 1993, p. 247).
- ❖ Although amblyopia, strabismus, nystagmus, and myopia seldom cause legal blindness they produce substantial visual loss that interferes with learning and working, and the overall quality of life (National Advisory Eye Council, 1993).

EYE INJURIES IN THE U.S.

The following statistics are based on estimates from the United States Eye Injury Registry (2000) - Selected data 1988-2000:

- ❖ Eye injury is a leading cause of monocular blindness in the United States, and is second only to cataract as the most common cause of visual impairment.

Causes of Eye Injury:

- ❖ Blunt objects account for about 31% of eye injuries, 18% are caused by sharp objects, 9% by motor vehicle crashes, with the remainder caused by bb/pellet guns (6%), nails (5%), hammer on metal (5%), fireworks (5%), guns (5%), falls (4%), explosion (3%), and other (8%).

Age

- ❖ The majority of all eye injuries occur in persons under thirty years of age (57%). Persons with an eye injury are an average age of 29 years (median age=26 years).

Place of Injury

- ❖ The highest proportion of eye injuries occur in the home (40%), followed by street/highway (13%), industrial (13%), playing a sport (13%), other (12%), and 9% are unknown.

Work-Related Eye Injuries

- ❖ 20% of eye injuries are work-related with 95% occurring among males.
- ❖ The leading occupation reported was construction.

COSTS OF VISION IMPAIRMENT

- ❖ In 1990, the aggregate federal budgetary cost of vision impairment was estimated to be \$4.1 billion dollars (Chiang, Bassi, & Javitt, 1992).
- ❖ In 1991, Medicare spent an estimated \$3.4 billion for 1.35 million episodes of cataract surgery (Agency for Health Care Policy and Research, 1993).
- ❖ Visual impairment has been identified as one of the four most significant contributors to lost independence among older Americans. The loss of independence (due to all causes) costs an additional \$26 billion in medical and long-term costs per year (Alliance for Aging Research, 1999).
- ❖ "In 1981, the economic impact of visual disorders and disabilities was approximately \$14.1 billion per year. By 1995, this figure was estimated to have risen to more than \$38.4 billion-\$22.3 billion in direct costs and another \$16.1 billion in indirect costs each year" (National Advisory Eye Council, 1998, p. 7).

COMPUTER USE AND INTERNET ACCESS

- ❖ Among persons age 21-64 with a vision impairment who are employed, an estimated 900,000 persons use a computer (Demographics Update, 1995a).

The following estimates are based on data collected from the Survey of Income and Program Participation (U.S. Department of Commerce, 2000):

- ❖ 51% of persons (all ages) with no disability regularly use a personal computer, in comparison to 13% of persons with vision problems. While 23% of persons without a disability have never used a computer, 70% of those with a visual problem have never used one.
- ❖ The majority of persons with no disabilities (57%) report having internet access (at home or elsewhere), in comparison to one-fifth (21%) of persons who have a vision problem.

- ❖ The differences in computer use and internet access among those with and without disabilities decrease slightly when considering only persons who are employed (age 25-49):
 - ◆ 17% of employed persons without a disability have never used a computer, in comparison to 31% of employed persons with vision problems.
 - ◆ 64% of employed persons without a disability have internet access (at home or elsewhere), in comparison to 54% of employed persons with vision problems.

USE OF ADAPTIVE EQUIPMENT, OPTICAL DEVICES, BRAILLE & GUIDE DOGS

- ❖ According to data collected from The Lighthouse National Survey on Vision Loss (The Lighthouse Inc., 1995), only 30% of adults (age 45 and older) with self-reported vision impairments report using an optical device (such as a magnifier or telescope).
- ❖ Large print materials are used by 21% of adults with self-reported vision impairments. Other adaptive devices (e.g., talking books, talking clocks, etc.) are used by an even smaller minority (under 5%) (The Lighthouse Inc. 1995).
- ❖ According to data from the 1994 National Health Interview Survey on Disability (Russell, Hendershot, LeClere et al., 1997), approximately 527,000 persons in the US use some type of vision device:
 - ◆ Telescopic lenses: 158,000
 - ◆ White cane: 130,000
 - ◆ Readers: 68,000
 - ◆ Braille: 59,000
 - ◆ Computer equipment: 34,000
 - ◆ Other vision technology: 277,000
- ❖ According to the American Printing House for the Blind (1999), approximately 10% of blind students (5,557) primarily use Braille and 25% primarily use large or regular print (14,571).
- ❖ Based on estimates compiled by the American Foundation for the Blind, just over 7,000 Americans use guide dogs.

VISION REHABILITATION SERVICE UTILIZATION

- ❖ According to data collected from the Lighthouse National Survey on Vision Loss (The Lighthouse Inc., 1995), low vision clinical services, rehabilitation training in activities of daily living, and recreational services for persons with vision problems were each used by only 1% of persons age 45 and older with a self-reported vision problem.
- ❖ Furthermore, only 2% of respondents reported using job placement and/or placement services, and 2% reported to have received counseling to help adjust emotionally to their vision problem (p. 24).
- ❖ Only 6% of respondents who reported some form of vision problem used any type of vision rehabilitation service.
- ❖ When asked why vision rehabilitation services were not used, a sizeable proportion of respondents reported being unfamiliar with their availability. Specifically, unawareness of each type of service was reported:
 - ◆ low vision clinical services (21%)
 - ◆ recreational services (19%)
 - ◆ rehabilitation training in daily skills (16%)
 - ◆ counseling services (12%)
 - ◆ job training/placement services (10%)
- ❖ Survey findings also revealed that 35% of middle aged and older adults do not know if there are local public or private agencies in their community that provide vision rehabilitation services.

USE OF CORRECTIVE EYEWEAR

- ❖ The American Optometric Association (1997) reports the following statistics on persons who wear contact lenses:
 - ◆ Nearly 25 million Americans wear contact lenses.
 - ◆ Two-thirds of all contact lens wearers are female.
 - ◆ Ten percent are age 16 or younger.
 - ◆ Thirty percent are 17 to 24 years old.
 - ◆ Fifty percent are 25 to 44 years old.
 - ◆ Most are nearsighted.

- ❖ It is estimated that more than 150 million people in the U.S. use corrective eyewear for refractive errors (Prevent Blindness America, 2002).
- ❖ An estimated 29% of males and 40% of females age 18 to 35 wear corrective lenses. This increases to 44% of males and 53% of females age 35 to 54 and 61% of males and 66% of females age 55 and older who wear corrective lenses (American Association of Retired Persons, 1995).

KNOWLEDGE & ATTITUDES ABOUT VISION LOSS

- ❖ Results of the Lighthouse National Survey on Vision Loss (The Lighthouse Inc., 1995) indicated that there is great fear and limited knowledge about vision loss and aging among middle aged and older adults:
 - ◆ Only 43% of respondents correctly identified the following statement as false: "All older people will become visually impaired as part of the normal aging process". Forty three percent believed it was true and 14% did not know.
 - ◆ 71% of Americans age 45 and older fear being blind more than being deaf; 76% fear blindness more than having to use a wheel chair; and 70% fear blindness more than losing a limb. Only 41% fear blindness more than having a mental or emotional illness.
 - ◆ 26% of people without a visual impairment report fear when meeting a person with a visual impairment, feeling "what's happened to them might happen to you".

VISION IMPAIRMENT: RACIAL & ETHNIC DIFFERENCES

- ❖ Based on findings from The Lighthouse National Survey on Vision Loss (The Lighthouse Inc., 1995), among persons age 45 and older, those who report some form of vision problem are more likely to be non-white (23%) in comparison to those who report no vision impairment (17%).
- ❖ African-Americans have a higher rate of legal blindness than Caucasians, but much of this difference may be due to poor access to appropriate eye care services (Prevent Blindness America, 1994, p.3).
- ❖ The Baltimore Eye Survey found that the overall age-adjusted rates of visual impairment among African Americans was twice that of whites (Tielsch, Sommer, Witt, Katz, & Royall, 1990).
- ❖ Data from the 1991-92 Survey of Income and Program Participation indicate that a higher proportion of Blacks have visual impairments than do Whites. Although Blacks comprise 12% of the U.S. population, among persons with visual impairments 18% are Black and among those with a severe visual impairment 21% are Black (Schmeidler & Halfmann, 1998a, p.539).

Glaucoma

- ❖ Based on findings from the Baltimore Eye Survey, the prevalence of blindness due to glaucoma is 4 to 6 times higher among blacks than Caucasians (Tielsch, Sommer, Witt, Katz, & Royall, 1990).
- ❖ Almost 4% of Blacks (409,643) (age 40 and over) are reported to have glaucoma as compared to about 1.7% of Whites (1.6 million) and 1.5% of Hispanics (131,654) (Prevent Blindness America, 2002).
- ❖ Research on a population-based sample found that glaucoma is the leading cause of blindness among Hispanics (Rodriguez, 2002).

Diabetic Retinopathy

- ❖ According to Prevent Blindness America (2002), before age 40, diabetic retinopathy affects Whites more frequently than other races, however Hispanics are the most commonly affected in later decades.
- ❖ African-Americans are twice as likely to suffer from diabetic-related legal blindness (American Diabetes Association).
- ❖ The prevalence of diabetic retinopathy in Mexican Americans is 32-40% (American Diabetes Association).

Macular Degeneration

- ❖ Age-specific prevalence rates of age-related macular degeneration are initially comparable between races, however advance more significantly for Whites after age 75 (Prevent Blindness America, 2002, p.18).

AREA OF RESIDENCE

- ❖ In the U.S., most persons who have a vision impairment live in metropolitan areas (70%), but they are less likely to live in metropolitan areas than are persons without visual impairments (78%) (Schmeidler & Halfmann, 1998b; based on 1994 NHIS-D).
- ❖ Among all individuals who report "serious difficulty seeing, even when wearing glasses or contact lenses," 33% live in cities, 37% live in suburbs, 28% live in non-metropolitan areas (e.g., small towns) and 1% live in farm areas (Schmeidler & Halfmann, 1998b).
- ❖ In comparison to the general population, persons who report serious difficulty seeing, are over-represented in cities and non-metropolitan areas and somewhat under-represented in the suburbs (i.e., 48% of general population live in suburbs) (Schmeidler & Halfmann, 1998b).

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