

Vision loss or visual impairment affects 32.2 million adults throughout the United States (American Foundation for the Blind [AFB], 2020a) and poses an annual economic burden in excess of \$145 billion (Wittenborn & Rein, 2014). Roughly 7.5 million individuals reported a vision disability in 2019; 684,509 of whom were Texans (U.S. Census Bureau, 2021a). The likelihood of having a vision disability increases with age. The following tables reflect vision disabilities reported by age group for the U.S., Texas, and the KCF counties of interest in 2019:

VISUAL DISABILITIES 2019						
	US		TX		Bexar	
Age	Number	%	Number	%	Number	%
Under 5	80,722	0.4	8,862	0.4	715	0.5
5 - 17	471,175	0.9	52,561	1.0	6,938	1.9
18 – 64	3,808,95	1.9	364,431	2.1	39,356	3.3
65 & over	3,109,24	6.3	258,655	7.7	20,732	9.1
Total	7,470,09		684,509		67,741	

(U.S. Census Bureau, 2021a)

VISUAL DISABILITIES 2019						
	Bandera		Comal		Kendall	
Age	Number	%	Number	%	Number	%
Under 5	0	0.0	16	0.2	57	2.7
5 - 17	115	4.0	201	0.8	68	0.8
18 – 64	281	2.3	2,041	2.4	323	1.3
65 & over	358	6.2	1,333	5.3	535	6.7
Total	754		3,591		983	

(U.S. Census Bureau, 2021a)

Visual impairment refers to the consequence of functional loss of vision such as losing the ability to perform daily living activities or function independently. Levels of visual impairments are defined as follows (American Optometric Association [AOA], n.d.):

- **Low vision:** best-corrected visual acuity in the better-seeing eye is:
 - 20/30 to 20/60 -- mild vision loss
 - 20/70 to 20/160 -- moderate low vision
 - 20/200 to 20/400 -- severe low vision
 - 20/500 to 20/1,000 -- profound low vision
- **Legal blindness:** best-corrected visual acuity less than 20/200 in the better-seeing eye or has a visual field extent less than 20 degrees in diameter (AOA, n.d.).
 - What a person with normal vision can see at 200 feet, a legally blind person can see at 20 ft.
 - 1,355,248 people in the U.S. are estimated to be blind (Wittenborn & Rein, 2014)
 - 71,731 Texans age 40 and older are estimated to be blind (Prevent Blindness America [PBA], 2012)

A wide variety of other conditions that result in visual impairment are described in greater detail below.

Retinal diseases involve the neural tissue that contains photoreceptor cells (rods and cones), located in the back of the eye. The retina converts light to electrical signals and then transmits the information via the optic nerve to the brain (National Eye Institute [NEI], 2019e).

- **Age-related Macular Degeneration (AMD):** Leading cause of vision loss in persons over 50 years of age with no known cure.
 - **Dry AMD:** the gradual break-down of cells in the macula (center of retina), resulting in blurring of the central vision of the affected eye

- Dry AMD makes up majority of all AMD cases
 - Gradual onset
 - **Wet AMD:** the growth of tiny blood vessels under the retina leak fluid or break, distorting vision and can form scar tissue
 - Rapid onset
 - Also known as Advanced AMD
 - A “blind spot” in the center of the eye is characteristic of wet AMD; the spot can grow over time but does not usually completely black out the entire vision range
 - Peripheral vision is typically maintained but can become so severely blurred that it is difficult to distinguish details (NEI, 2020a)
 - 11 million people in the U.S. are estimated to have AMD (BrightFocus Foundation, 2019)
 - 118,169 Texans over age 50 have AMD (PBA, 2012)
- **Diabetic Retinopathy:** Damage to the blood vessels in the retina. There are four progressive stages (Eye Center of Texas, 2019):
- Mild Nonproliferative Retinopathy: microaneurysms occur
 - Moderate Nonproliferative Retinopathy: some blood vessels become blocked
 - Severe Nonproliferative Retinopathy: many more blood vessels become blocked triggering growth of new vessels
 - Proliferative Retinopathy: numerous newly grown blood vessels are abnormally fragile and may leak, causing severe vision loss or blindness
 - Treatment for the first three stages is unnecessary; control of diabetic issues such as blood sugar, blood pressure, and cholesterol have been shown to slow down progression of the disease
 - Proliferative retinopathy is treated with laser surgery
 - More than 2 in 5 Americans diagnosed with diabetes have some stage of diabetic retinopathy (NEI, 2019d).

- From 2010 to 2050, the number of Americans with diabetic retinopathy is expected to nearly double, from 7.7 million to 14.6 million (NEI, 2020b)
- 607,054 Texans have diabetic retinopathy (PBA, 2012)

Corneal diseases affect the transparent tissue at the front of the eye that serves as both a protective physical barrier, by shielding the eye from the external environment, and as the main refractive element of the eye, directing incoming light onto the lens (NEI, 2019b):

➤ **Refractive errors**

- Myopia (nearsightedness) – incoming light rays focused in front of the retina
- Hyperopia (farsightedness) – incoming light rays focused behind the retina
- Astigmatism – light rays not focused on a single point
- Over 2.3 million individuals in Texas are myopic (PBA, 2012)
- 929,605 Texans are hyperopic (PBA, 2012)

➤ **Corneal Dystrophies:** conditions in which one or more parts of the cornea lose their normal clarity due to a buildup of cloudy material. There are several different types of corneal dystrophies that affect all parts of the cornea.

➤ **Keratoconus:** progressive thinning of the cornea that results in thin, bulging, conically shaped corneas that can cause severe visual impairment. This affects one in every 2,000 Americans (NEI, 2019c).

Glaucoma is a group of diseases that cause a gradual degeneration of cells that make up the optic nerve (NEI, 2020c):

- Elevated pressure inside the eye is frequently, but not always, present
- Vision loss is gradual and usually unnoticed until significant, irreversible nerve damage occurs
- Peripheral and side vision is lost first, creating a “tunnel effect” where patients only see what is central in their vision. Gradually, this central vision also begins to deteriorate until little or no vision remains.

- Can be treated with medication and/or surgery to slow the progression of the disease
- Highest risk for African Americans or Hispanic Americans over age 40; everyone over age 60
- About 3 million Americans are estimated to have glaucoma (Centers for Disease Control and Prevention [CDC], 2020b).
- 184,720 Texans have glaucoma (PBA, 2012)

Cataracts are the leading cause of blindness in the United States according to the CDC (2020a). A clouding of the eye’s naturally clear lens that interferes with vision, a cataract is the result of a build-up of proteins in the lens (NEI, 2019a):

- Occur mostly in older persons
- Fuzzy or blurred vision is sometimes the first symptom
- Outpatient surgery is the only option for mild to severe cataract, and is usually performed by replacing the cataract affected lens with an artificial lens
- Medical costs and prescription drug services total \$10.7 billion a year for cataract treatment (The Optical Journal, 2014)
- 30.1 million people in the U.S. are estimated to have cataracts in 2020 (CDC, 2020a)
- 1,589,280 Texans have cataracts (PBA, 2012)

Vision Is a Continuum

A person with low vision has severely reduced visual acuity and/or has a significantly obstructed field of vision that cannot be corrected by glasses, medicine or surgery (NEI, 2020d). Persons with visual impairments face a variety of challenges on a day-to-day basis. These difficulties often lead persons with visual impairments to suffer from loneliness, isolation, and depression. Even simple tasks such as preparing food may become extremely difficult.

The elderly have the highest risk for developing visual impairments, and suffer the most from the effects of vision loss due to the inability to adapt to a world of non-vision. In 2019, people 65 years and older made up 16.5% of the

United States population; in Texas, they made up 12.9% of the population. Bandera (27.9%), Bexar (12.4%), Comal (18.3%), and Kendall (19.3%) counties all have percentages of elderly residents near or exceeding the state average (U.S. Census Bureau, 2021b).

Early and frequent screening of older adults is imperative to minimize the impact of vision problems. The National Institute on Aging (2017) states that most vision problems among seniors can be treated or avoided if treated before the problem becomes too severe.

Low Vision Rehabilitation

Low vision exams may be necessary to assess a patient’s level of usable vision. Provided by low vision specialists, these exams are conducted using specialized charts (versus the standard eye chart) as well as tests to measure contrast sensitivity, size, and location of blurry or distorted areas in the visual field, and other functions such as how well someone can see faces, street signs, newspaper print, stove dials, etc. (AOA, n.d.).

The goal of a low vision exam is to help maximize the use of remaining vision. Low vision doctors prescribe prescription eyewear, filters, microscopic-telescopic eyewear, magnifiers, adaptive equipment, closed circuit television systems, independent living devices, and provide training and counseling for patients (AFB, 2020b).

While low vision exams are not currently covered under most vision insurance policies, including Medicare (Sharp Eyes Vision Center, 2020), there is some help available for Texans through the Texas Health and Human Services Blind and Visually Impaired Services (Texas Health and Human Services [HHS], 2021).

Accessible Media

It is especially important for seniors to access resources to help alleviate feelings of isolation. Certain adaptations, such as learning to read Braille, are very difficult to attain. There are a limited number of services available to address this growing need:

- **U.S. Library of Congress National Library Service for the Blind and Physically Handicapped (NLS):** any U.S. citizen who is unable to read or use standard print materials, as a result of a temporary or permanent visual or physical limitation, may receive service. Playback equipment, books, magazines, and catalogs are sent directly to the subscriber by U.S. Postal Services as “Free Matter for the Blind” and are returned the same way. There is no cost to the individual for this service.

The technologies used for this service are either a portable digital talking-book player or mobile reading app that allows visually impaired readers to easily navigate through books. There are two types of digital players, a standard model and a more advanced one that has navigation and bookmarking capabilities (NLS, n.d.).
- **Texas Talking Book Program** “provides free library services for Texans with blindness, visual, physical, or reading disabilities. Registered TBP users may borrow books and magazines in digital audio, Braille and large print” (HHS, 2021).
- **National Federation of the Blind** offers a free newspaper and magazine reading service (U.S. newspapers only) where qualified individuals call a toll-free number and can hear articles from national and local papers and magazines, including four Spanish language papers, read over the phone, a mobile app, or via website (National Federation of the Blind, 2021).
- **Owl Radio** in San Antonio provides daily radio broadcasts of newspapers, magazines, and other information. Programming is transmitted to special radio receivers provided to qualified applicants over subcarriers provided by Texas Public Radio (Low Vision Resource Center, n.d.).

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