



National Center for Children's Vision and Eye Health

Prevent Blindness



Children's Vision and Eye Health: A Snapshot of Current National Issues

(2nd Edition)

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About Prevent Blindness and the National Center for Children’s Vision and Eye Health (NCCVEH)

Prevent Blindness is the leading national nonprofit 501(c)(3) organization dedicated to preventing blindness and preserving sight across all life stages. We bring together science and policy to implement positive population-based change with an emphasis on early detection and access to appropriate care. We focus on improving the nation’s vision and eye health by educating the American public on the importance of caring for their eyes and vision by promoting advances in public health systems that support eye health needs and advocating for public policy that emphasizes early detection and access to appropriate eye care.

Quality practices and systems for children’s vision include establishment of a surveillance system, coordination, and collaboration among agencies and community partners, a comprehensive screening and referral infrastructure, a uniform approach to training, technical assistance resources, improved policies, and increased public and professional education and awareness. Realizing that all stakeholders across the spectrum must be engaged in this challenge, Prevent Blindness established our *National Center for Children’s Vision and Eye Health* (NCCVEH) in 2009 to strengthen the nation’s public health system for children’s vision. Over the past 10 years the NCCVEH has reshaped the system for children’s vision health through strong partnerships, sound science, and targeted policy initiatives to ensure that no child is impeded in school or life because of an undiagnosed vision problem.

The NCCVEH is supported by a grant from HRSA’s Maternal and Child Health Bureau (Grant # H7MMC24738– Vision Screening for Young Children).

About this Report

The Children’s Vision and Eye Health: A Snapshot of Current National Issues 2nd Edition offers a compilation of current research, survey data, and best-practices that outline the current landscape for children’s vision and eye health in the U.S. It is our intent that the information and examples provided in this report will translate into effective community- and state-level health promotion strategies that lead to improved vision. The report is designed to give diverse stakeholders the knowledge to implement systems-level changes, including but not limited to public health practitioners, primary health care providers, parent advocates, early childcare providers, policy makers, community and business leaders, community-based organizations, educators, school nurses and others interested in improving the health of children.

This report should be used along with technical assistance offered by the NCCVEH, local and state health experts, public health program managers, researchers, and others with relevant expertise to ensure successful changes in your vision health system for children.





The following staff members of Prevent Blindness and the NCCVEH assisted in the development of this publication: Donna Fishman, Kira Baldonado, Arzu Bilazer, Sara Brown, P. Kay Nottingham Chaplin, EdD., and Paulette Tattersall. Linda C. Wolfe, EdD, RN served as editor. The Advisory Committee to the NCCVH provided content and review.

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Please visit <https://nationalcenter.preventblindness.org/wp-content/uploads/sites/22/2020/06/Advisory-Committee-List-2020-for-Website-003.pdf> for a full list of Advisory Committee members.

INTRODUCTION



Everything Is So Clear

When my daughter Zoe was in the first grade, her teacher recommended we have her eyesight checked. I found the request odd as Zoe had regular check-ups with her pediatrician and had not complained of things not “looking right.” However, of course I wanted to make sure she was okay. When we met with the eye doctor, she walked us through several comprehensive tests. We discovered Zoe needed eyeglasses. A few weeks later after receiving the glasses, we walked out of the office, and Zoe said, “Wow! Everything is so clear! The trees used to look like blobs of color but now I see their shape. Everything is so pretty!”¹

When Samantha was a toddler, I asked my husband, “Do you see her squinting?”

In sharing this concern with Samantha’s pediatrician, we were referred to an ophthalmologist who diagnosed her with hyperopia (farsightedness) and prescribed eyeglasses. We sat at the kitchen table, put a pair of pink frames on a squirming, fussing 18-month-old Samantha, and instantly saw a child go quiet and become enthralled by the book in front of her. Magic. Or if you have normal vision—sight!²

There are many success stories of children who have received treatment for visual disorders. However, for too many children, such disorders are often not identified and thus not treated early. These children may fall behind in school, exhibit behavioral disorders in the classroom, and lag in reaching developmental milestones. Everyone has a role in the early identification of children’s vision disorders—parents, pediatricians and primary care providers, preschool program providers, school nurses, and teachers, among others.

Vision has a critical role in children’s physical, cognitive, and social development. Up to one in 17 young children and one in five preschool-age children enrolled in Head Start has an undiagnosed vision disorder.³ Without early detection and treatment, uncorrected vision disorders can impair child development, interfere with learning, and even lead to permanent vision loss.^{4,5,6,7,8} Moreover, visual functioning is a strong predictor of academic performance in school-age children,⁹ and vision disorders in childhood may continue to affect health and well-being through adulthood.¹⁰

Vision is a global concern. According to the World Health Organization (WHO), 2.2 billion people have vision impairment, with 1 billion estimated to be being children.¹¹ The majority of children have uncorrected refractive error (URE). Blindness resulting from URE and other causes have been diagnosed in 1.4 million children¹² (Box 1). Researchers estimate

that in 2015, there were 174,000 preschool-age children in the U.S. with a visual impairment, with conditions including uncorrected refractive error amblyopia, and other eye diseases.¹³ Blindness in childhood is particularly concerning, as many disorders leading to impairment are preventable.¹² One of the greatest concerns is that vision loss will impact a child’s quality of life, affecting financial, social, and employment opportunities over his or her lifespan.

The economic costs of children’s vision disorders are significant, amounting to \$10 billion yearly in the U.S.¹⁴ Typically, families shoulder 45% of these costs.¹⁴ This estimate accounts for the costs of medical care, vision aids and devices, caregivers, special education, federal assistance programs, vision screening programs, and quality of life losses, and does not take into account any limitations in future employment or social opportunities.

On the global level, several notable organizations have identified the need for comprehensive wellness and addressed the social determinants impacting health. The United Nations has developed Sustainable Development Goals (SDG) to address the health needs of the global population.¹⁵ The third SDG, often referred to as Universal Health, focuses on good health and wellness for all. Although eye health falls under this heading, vision and eye health also impact other SDGs. For example, SDG Goals 1 and 4—poverty and quality education, respectively—are both directly impacted by visual ability. Numerous researchers have shown

BOX 1. Vision Impairment Definitions

Legal Blindness: Visual acuity that does not exceed 20/200 in the better eye with a correcting lens; and the 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 a person with “normal” sight can see at 200 feet).

Severe Visual Impairment:

An inability to read ordinary newspaper print, even with the aid of glasses. The impairment indicates no useful vision in either eye and includes those who are legally blind.

Visually Impaired: Persons who have some difficulty seeing with one or both eyes even with the use of glasses.

Source: Prevent Blindness, 2019.

that vision disorders, if not identified and addressed in a timely fashion, can compromise a child’s academic success. Poverty also restricts access to quality eye services, and children with disabilities have a higher prevalence of vision and eye health disorders.

The WHO reports that “vision, the most dominant of our senses, is vital at every turn of our lives yet it is overlooked worldwide and often untreated.”¹¹ In 2018, the G20 Development Working Group called for “investing in early childhood [ages 0–8 years] development,” which includes reducing the cycle of poverty and inequality.¹⁶ Development is defined as the “continuous acquisition of skills and abilities across the domains of cognition, language, motor, social and emotional development.”¹⁶ As vision is vital to each of these developmental areas, the NCCVEH advocates for eye health as a part of this important initiative. **We must recognize the paramount importance of vision within the current contexts of comprehensive health and the social determinants of health.**

In the U.S., vision care for children (including eye health education, screenings, care coordination, eye care, and treatment) is addressed in a variety of venues, including primary care offices, public health clinics, schools, childcare facilities, eye care provider offices, and community health program settings. Early detection, diagnosis, and treatment of a vision disorder is

critical to a child’s long-term vision health, and vision screenings serve a useful role in identifying children in need of eye care and promote further evaluation by a professional. Many children in the U.S. do not receive timely vision screenings or access to professional eye care,¹⁷ and wide variation exists among the laws and regulations related to vision and eye health.

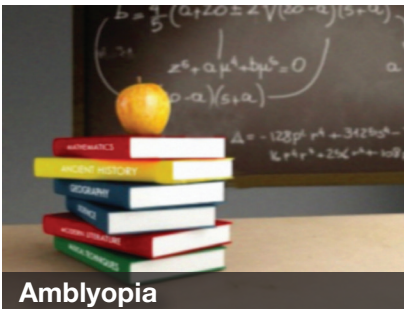
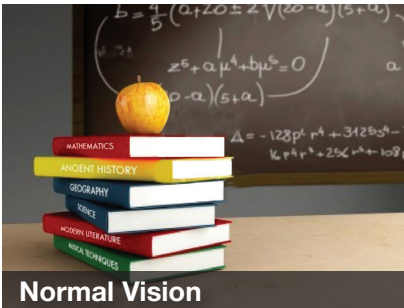
The purpose of this report is to provide facts and strategies to help readers facilitate change on a state and local level in order to eradicate blindness and visual impairment. This document brings together information on the scope of vision disorders in children, national and state-level policies, and efforts to build comprehensive systems to promote children’s vision and eye health. Research is continuously providing new knowledge on risk factors, better access to needed services, and estimates of the prevalence of vision disorders among U.S. children.

Given the importance of vision in early childhood development, the NCCVEH will continue to advocate for appropriate vision and eye health services to help all children reach their full potential. **Much work remains to build awareness of the significance of vision disorders and ensure that every state initiates a comprehensive system to promote vision and eye health.** This report is intended as a tool to engage readers in supporting our efforts.

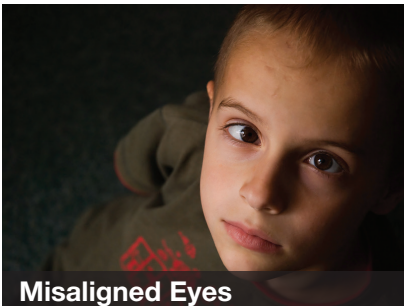
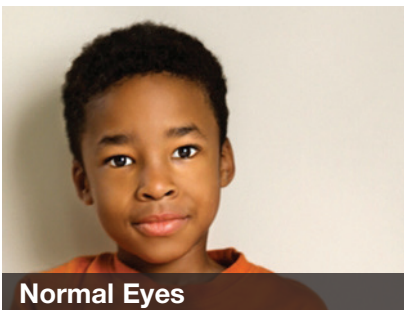


Common Vision Disorders in Children

Amblyopia



Strabismus



VISION LOSS

According to the 2016–2017 National Survey of Children’s Health, 1.6% of U.S. children from birth through 17 years suffered from blindness or had problems seeing even with the use of glasses, which represents over 1.1 million children.¹⁸ The number of preschool children (ages 3 to 5) in the U.S. with vision impairment is estimated to be more than 174,000.¹³ An analysis of children’s vision disorders in 2015 with projections to 2060 indicates significant increases in visual impairment among Hispanic, Asian-American, and multi-racial children ages 36 months to 72 months old¹³ (Table 6). California, Florida, and Texas are estimated to be the states most impacted.¹³

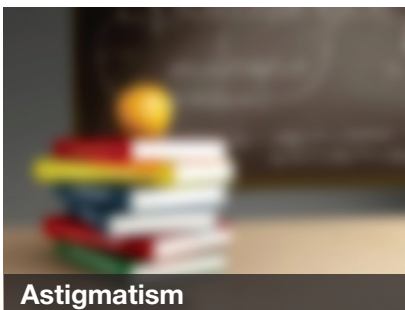
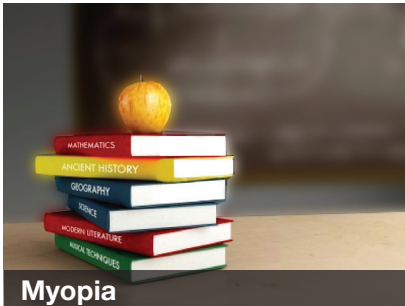
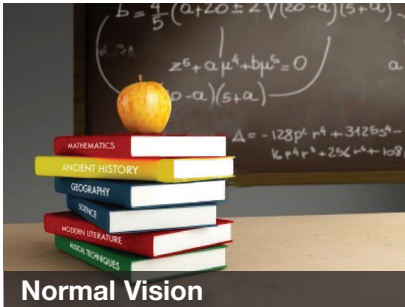
AMBLYOPIA

Amblyopia (sometimes called “lazy eye”) is the most common cause of vision loss in children and occurs in about 2% to 4% of young children (ages 6 months to 6 years)^{19,20,21} With amblyopia, vision is impaired due to abnormal development of the neural connections between the brain and the eye during early childhood. The primary causes are misalignment of the eyes (strabismus) and high-uncorrected refractive error or unequal refractive error between the eyes.²² Amblyopia may also occur with other causes of vision loss. Typically, the vision loss affects only one eye, but people with amblyopia are nearly three times more likely to develop vision impairment in their better-seeing eye later in life.²³ Early detection of amblyopia is critical

as treatment is most successful when initiated *before* age 7. The battle to prevent vision loss due to amblyopia is a winnable battle; other countries have made strides toward eradicating vision loss due to amblyopia.²⁴ Without early treatment, amblyopia can lead to permanent vision loss in one or both eyes.²⁵

STRABISMUS

Strabismus, or misalignment of the eyes, occurs in 2% to 4% of children under the age of 6.^{19,20,21} The term “eye alignment” refers to how the eyes align and work together when looking at an object. Strabismus orients the eyes in different directions and thus the brain receives conflicting visual input, interfering with binocular vision development and depth perception. Terms used to describe the direction of the eye(s) are: esotropia (eye turns inward toward the nose), exotropia (eye turns outward and to the side), hypertropia (eye turns upward), and hypotropia (eye turns downward). Without treatment, vision loss in one eye can occur and the appearance of misaligned eyes may negatively affect the emotional health, social relationships, and self-image of children.⁴ Risk factors for strabismus are family history of the condition, prematurity, and maternal smoking.²⁶



REFRACTIVE ERRORS

The most common vision disorders in children are refractive errors: myopia (“nearsightedness”), hyperopia (“farsightedness”), and astigmatism (irregular shape of the front surface of the cornea, the transparent “window” at the front of the eye). Refractive errors occur when light does not focus on the retina (the “film” in the “camera”), causing blurred vision. Uncorrected refractive errors in young children are associated with parental concerns about developmental delay, as well as deficits in cognitive and visual-motor functions that may affect school readiness and performance.^{5,6,7}

Estimates of prevalence vary due to differences in diagnostic criteria and examination methods. Refractive errors make up 70% of decreased visual acuity in Asian and non-Hispanic White children and more than 90% of decreased vision acuity with an identifiable cause.²⁷

Myopia is a condition in which objects in the distance are blurry. Four percent of children aged 6 months to 6 years²⁸ and 9% of older children (ages 5 to 17 years)²⁹ have myopia, or nearsightedness. Prevalence varies by age and race/ethnicity.^{29,30,31}

Hyperopia is a condition whereby close objects are blurry. The prevalence of hyperopia, or farsightedness (when nearby objects appear blurry), is 21% among children 6 months to 6 years²⁸ and 13% among children aged 5 to 17.²⁹ As with myopia, the prevalence varies by age and race/

ethnicity.^{29,30,31} Further, children of mothers who smoked during pregnancy have higher rates of hyperopia.³² Untreated hyperopia compromises a child’s readiness for learning by interfering with reading skills.¹³

Astigmatism is an irregularity in the shape of the cornea or lens that causes blurry vision at distances if not corrected. Depending on the diagnostic threshold used, 15% to 28% of children aged 5 to 17 years have astigmatism.²⁹ Children with refractive errors are more likely to have astigmatism¹⁷ as well as those whose mothers smoked during pregnancy.³³

Early Detection of Children's Vision Disorders



Children and their parents may not be aware of reduced visual functioning. Therefore, when children do not pass a vision screening, comprehensive eye examinations are vitally important to detect, diagnose, and treat disorders before they lead to interference with normal development and academic success. Any concern identified by vision screening must be followed up with a comprehensive eye examination (Box 2). Vision screening and eye examinations are complementary and essential elements of a strong public health approach to vision and eye health.

Forty-one states (including D.C.) mandate some type of vision screening for children. Of those, 40 require vision screening for school-age children.³⁴ Only 26 states require vision screening for preschool-age children.³⁴ Head Start and Early Head Start programs—which together serve nearly 1 million children younger than 5 years old³⁰—are required to provide a record of a completed vision screening for all enrollees within 45 days of entry³¹ (please refer to Appendix B for a list of state vision screening requirements). While more states are establishing vision screening guidelines or requirements compared to the number of states five years ago,³⁵ there is no national uniformity in vision screening by method or frequency.

Box 2. Vision Screening and Eye Examinations: Definitions

Vision Screening

- Identifies those who may be at high risk for a vision problem or in need of a professional eye examination
- May detect vision disorders early when treatment is typically more effective
- Provides valuable information and education on the importance of vision
- Results in a referral to an eye care professional for an examination when screening tests indicate the presence of a possible disorder

Eye Examination

- Provides a comprehensive evaluation of vision functioning and eye health
- Is performed by an ophthalmologist or optometrist trained and licensed to diagnose and prescribe treatment for vision disorders
- Is generally understood to include an evaluation of visual acuity, ocular alignment, refractive state, binocularity, color vision, and eye health
- Uses eye drops that dilate the pupils to provide the doctor a better view of the back of the eye

Screening Rates

Box 3. The Importance of Reliable Data for Vision Screening Goals

“The absence of a standardized approach to the determination of vision screening rates means that the United States lacks reliable data to track national progress toward vision screening goals or to compare rates of vision screening across states and regions.”

Source: Marsh-Tootle WL, Russ SA, Repka MX, & National Expert Panel to the NCCVEH, 2019.³⁶



The data presented in this report were analyzed by the NCCVEH using the 2016–2017 combined National Survey of Children’s Health results. The vision questions include: Has (child) [ever (0-5)/ during the past 2 years (6–17)] had his or her vision tested with pictures, shapes, or letters?

Source: Child and Adolescent Health Measurement Initiative, 2019

Currently, it is difficult to determine with certainty how many children receive vision a screening in the U.S. since estimates vary depending on the date source and type of screenings studied.^{36,37} The main sources of data on screening rates are surveys of parents (or other adult members of households) and typically do not define what constitutes a vision screening or specify the type of test or provider (Box 3).

Healthy People 2020, a comprehensive set of ten-year national goals and objectives for improving the health of all Americans, used the 2008 National Health Interview Survey for baseline data on vision screening.³⁸ In that survey, only 40% of children aged 5 and younger had ever had their “vision tested by a doctor or other professional.”¹⁸ This estimate is consistent with the 2016–2017 National Survey of Children’s Health that found only 39% of children aged 5 and younger had ever had their vision tested¹⁸ (Table 1). Additionally, 86% of children aged 6 to 11 had their vision tested (with pictures, shapes, or letters) within the past two years. Neither survey provides information on the type of testing or whether children received vision screening or comprehensive eye examinations. However, the surveys do provide national, population-based data that point to significant disparities in vision assessment rates by household income, education levels, insurance coverage, race/ethnicity, and primary household language (Table 1 and Table 3).

A closer look at the data is needed to differentiate between those who do and do not receive vision

screening. In 2016–2017, 70% of all children aged 0–17 and 81% of those aged 0–17 with special health care needs received vision testing (Table 3). However, lower rates of vision testing were found among non-White children (Table 1 and Table 3). For information on vision testing by state, please see Appendix A: Vision Screening Percentages by State, Age and Race and Ethnicity by age 0–5, 6–11, and 12–17.

A consistent primary care provider, also known as a medical home, is an important site of vision screening (Table 2 and Table 3). The American Academy of Pediatrics in partnership with the Health Resources and Services Administration– Maternal and Child Health Bureau recommends vision screening at well child visits as a part of their Bright Futures recommendations.³⁹ Medicaid’s Early and Periodic Screening, Diagnosis, and Treatment Program (EPSDT) requires vision services to be provided “at intervals that meet reasonable standards as determined in consultation with medical experts” for all enrollees younger than 21.⁴⁰ However, in nine states examined for a 2010 report by the Office of Inspector General of the Department of Health and Human Services, 60% of children on Medicaid received no vision screening.⁴¹ The Centers for Medicare & Medicaid Services does not require states to report vision screenings and has determined that such a requirement is not feasible at this time due in part to the lack of access to data from school-based screenings and non-standard billing codes for vision screening in children younger than three years old.⁴²

Table 1.**Percentage of Children Receiving Vision Testing by Age and Race/Ethnicity in Children Age 17 Years and Younger 2016-2017.**

Data from the National Survey of Children's Health 2016–2017. Survey Question asked: Has the child ever (if 0–5 years of age) or during the past 2 years (if 6–17 years of age) had his or her vision tested with pictures, shapes, or letters?

	Total: % Tested	Hispanic: % Tested	White: % Tested	African American: % Tested	Asian: % Tested	Other/ Multi-racial/ non-Hispanic: % Tested
0–5 years	39	38	39	42	37	40
6–11 years	86	81	87	84	81	88
12–17 years	83	83	83	83	81	80

Source: Child and Adolescent Health Measurement Initiative, 2019.¹⁸

Because of changes in the survey's mode of data collection and sampling frame, as well as adjustments to item wording where necessary, it is not possible to compare estimates from the redesigned 2016–2017 National Survey of Children's Health (NSCH) survey to those from previous iterations or to conduct

related trend analyses. (Source: <https://census.gov/content/dam/Census/programs-surveys/nsch/tech-documentation/methodology/NSCH-2016-FAQs.pdf>). More recent data from the National Survey of Children's Health can be found at www.childhealthdata.org/. This survey is now conducted annually.

Table 2.**Vision Testing Sites for Children in the U.S. in Children Age 17 Years and Younger 2016-2017**

Data from the National Survey of Children's Health 2016–2017 Survey. Question asked: Has the child ever (if 0–5 years of age) or during the past 2 years (if 6–17 years of age) had his or her vision tested with pictures, shapes, or letters?

Vision testing sites among children who received vision testing	Age 0–5	Age 6–11	Age 12–17
Eye doctor or eye specialist's office	29%	51.3%	70.7%
Pediatrician or general doctor's office	67%	46.3%	30.9%
Clinic or health center	6.3%	5.3%	4.4%
School	18.2%	29.9%	16%
Other place	1.8%	.4%	.8%

Note: A parent or caregiver reported this data. Data on the type of test or the provider is unknown.

Source: Child and Adolescent Health Measurement Initiative, 2019.¹⁸



Equity Matters in Vision



Socioeconomic and racial inequities impact health care in the U.S. Certain racial and ethnic groups face increasing challenges to health and well-being, which compromises healthy child development. Vision is essential to health and well-being. Equity in vision health and development means ensuring that all children are born in optimal health, receive age-appropriate screening, and have access to quality services to support good health.

What the Data Tell Us

The National Survey of Children's Health (2016–2017) includes data on social determinants of health, such as household income and educational level, and their association with vision testing for children 17 years and younger (Table 3 and Appendix A.) Some key findings include:¹⁸

- Non-Hispanic children aged 0–17 years whose primary language at home was not English had the lowest percentage of vision testing as compared to children in homes where English or Spanish were spoken (Table 3).
- Children in families with greater household income are more likely to have received vision testing.
- Children in families with adults that have a college education compared to those in homes with adults that did not complete high school or who have some college education are more likely to have received vision testing.

- Disparities in vision testing were identified in the survey. Children 17 years or younger with the following demographics were more likely to have received vision testing:
 - » private health insurance
 - » consistent health insurance within the last year
 - » a medical home or consistent health care provider
 - » being non-Hispanic and living in a home where English is the primary language.

Table 3.**Receipt of Vision Testing in Children Age 17 Years and Younger**

Data from the National Survey of Children's Health 2016–2017. Survey Question asked: *Has the child ever (if 0–5 years of age) or during the past 2 years (if 6–17 years of age) had his or her vision tested with pictures, shapes, or letters?*

INSURANCE STATUS	% Tested	% Not Tested
Insured at time of survey	70.4	29.6
Not insured at time of survey	58.4	41.6
Consistently insured throughout past year	70.6	29.4
Currently uninsured or had periods without coverage	60.8	39.2
TYPE OF INSURANCE AT TIME OF SURVEY	% Tested	% Not Tested
Public insurance only	69	31
Private insurance only	72	28
Public and private insurance	71	29
Currently uninsured	58	42
INCOME	% Tested	% Not Tested
Household income 0-99% FPL*	67.7	32.3
Household income 100-199% FPL	67.8	32.2
Household income 200-399% FPL	69.2	30.8
Household income 400% FPL or greater	72.8	27.2
ADULT EDUCATION	% Tested	% Not Tested
Adult: Less than high school education	64.4	35.6
Adult: High school or GED	71.3	28.7
Adult: Some college or technical school	69.1	30.9
Adult: College degree or higher	70.5	29.5
MEDICAL HOME	% Tested	% Not Tested
Care met medical home criteria	72.2	27.8
Care did not meet medical home criteria	67.3	32.7
LANGUAGE SPOKEN AT HOME – HISPANIC CHILDREN	% Tested	% Not Tested
Primary household language is English, among Hispanic children	72	28
Primary household language is not English, among Hispanic children	68	33
LANGUAGE SPOKEN AT HOME – NON-HISPANIC CHILDREN	% Tested	% Not Tested
Primary language in household English	70.9	29.1
Primary language in household Other than English	62.9	37.1
SPECIAL HEALTH CARE NEEDS	% Tested	% Not Tested
Children with special health care needs (CSHCN)**	81	19
Non-CSHCN	67	33

* FPL: Federal Poverty Level

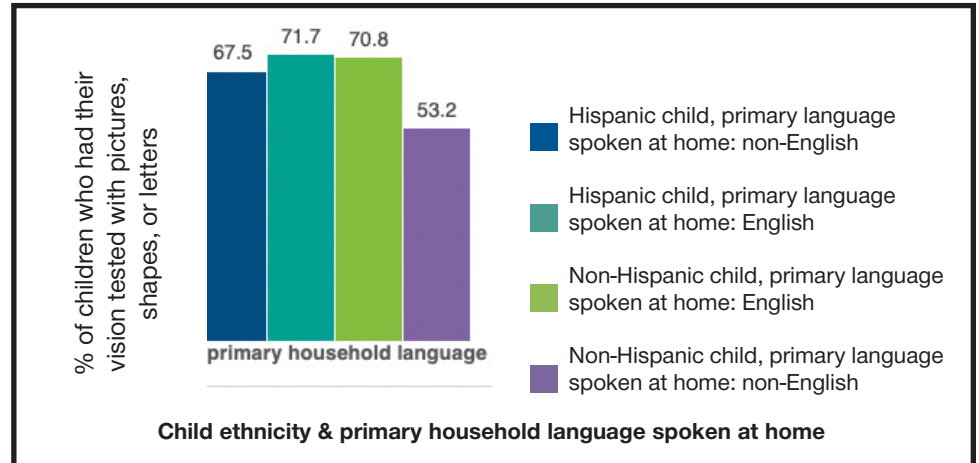
Source: <https://mchb.hrsa.gov/maternal-child-health-topics/children-and-youth-special-health-needs#ref1>

** Children with special health care needs, as defined by HRSA's Maternal and Child Health Bureau, "have or are at increased risk for chronic physical, developmental, behavioral or emotional conditions and who also require health and related services of a type or amount beyond that required by children generally."

Source: Child and Adolescent Health Measurement Initiative, 2019.¹⁸



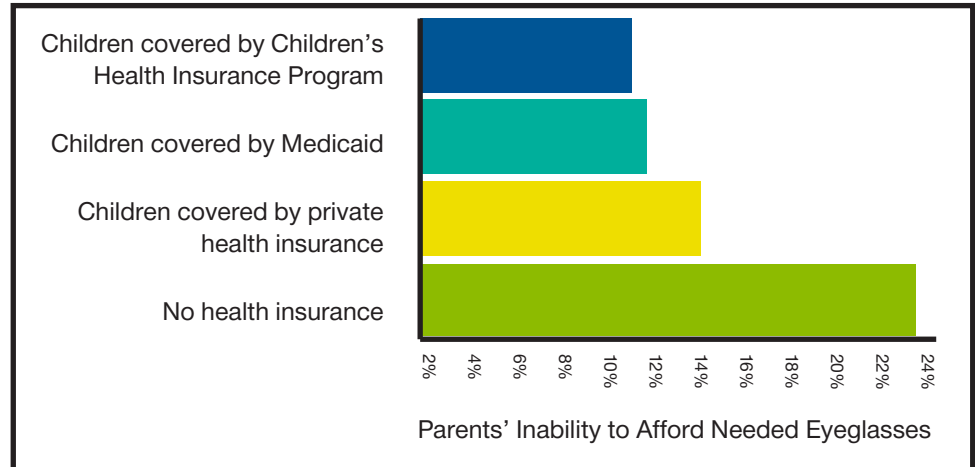
Table 4.
Percentage of Children Receiving Vision Testing by Ethnicity and Primary Household Language in Children Age 17 Years and Younger 2016-2017



Source: Child and Adolescent Health Measurement Initiative, 2019.¹⁸

Children experiencing health and socioeconomic inequities have lower rates of vision testing, experience disparities in visual impairment, and reduced access to care. For example, a lack of health insurance impedes a family’s ability to purchase eyeglasses (Table 5). It has been reported that Latino and African-American children were two to three times more likely to have unmet vision needs. Even with health insurance (public or private), only 15% of such children had a policy that included vision health.⁴³ An analysis of

children’s vision disorders in 2015 with projections to 2060 indicates significant increases in visual impairment among Hispanic, Asian-American, and multi-racial children 36 months to 72 months old¹³ (Table 6). According to several studies, early detection, uniform systems of accessible care for all children, and referral completion to available eye care are critical components of an equitable system that will lead to improvements in children’s health and learning.⁴⁴

Table 5.**Parent Difficulty in Affording Needed Eyeglasses for Their Children by Child’s Health Insurance Status (2004–2006)**

Source: Zhang, Elliott, Saaddine, et al., 2012.⁴³

Data from the National Survey of Children’s Health 2016–2017 provide clear opportunities for improving equity for early detection and treatment of vision disorders in children. It is incumbent upon us to identify targeted outreach strategies benefiting children with special health care needs. Such strategies must also be targeted to children in lower-income households, in households with less formal education, those who are Medicaid/SCHIP recipients, those with inconsistent or no insurance, and those in which the household language is other than English (Table 3, Table 4, Table 5, and Appendix A).

Improving Vision Equity

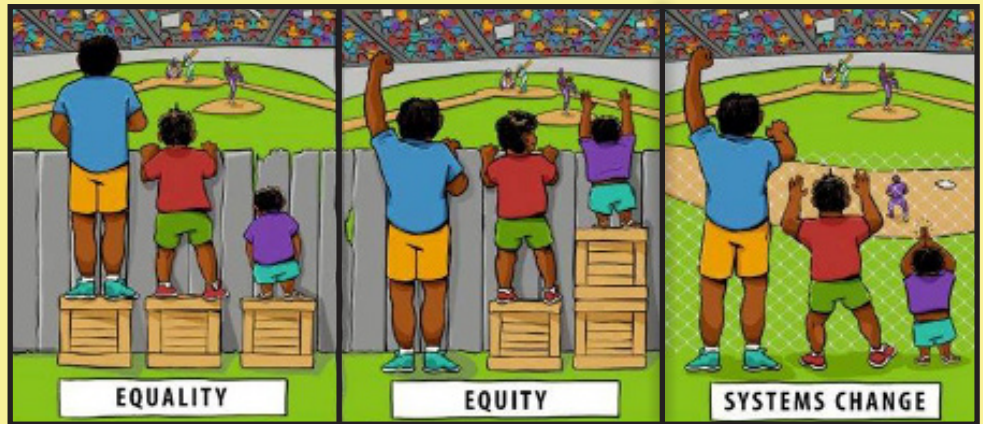
Equality means treating everyone the same, while equity is giving everyone what they need to be successful (Box 4). Achieving and maintaining optimum vision health requires the right resources. We must strive for equity to achieve optimum vision health. The report from the National Academies of Sciences, Engineering and Medicine (NASEM), *Making Eye Health a Population Health Imperative: Vision for Tomorrow*, reminds us to address “questions about broader conditions that may prevent access to existing eye and vision services.”²¹ Access to care is one of

Table 6.**Visual Impairment in Preschool Children Aged 36–72 Months by Race/Ethnicity, 2015–2060**

Race/Ethnicity	2015		2060		Δ2015–2060	
	No.	%	No.	%	No.	%
African American	42,831	24.5	48,518	22.0	+5,687	+13.3
Hispanic	65,782	37.7	96,110	43.6	+30,328	+46.1
Asian American	5,049	2.9	9,154	4.2	+4,105	+81.3
Other Minority	3,693	2.1	3,592	1.6	-101	-2.7
Multi-racial	11,315	6.5	26,779	12.1	+15,464	+136.7
White	45,922	26.3	36,422	16.5	-9,500	-20.7
Total	174,592	100.0	220,575	100.0	+45,983	+26.3
Uncorrected RE	120,591	69.1	154,057	69.8	+33,466	+27.8

Source: Varma, Tarczy-Hornoch, & Jiang, 2017.¹³

Box 4. Equity Graphic



Source: Adapted from Duke University Talent Identification Program

the many forms of health inequity. To assure equity **we must ensure the right resource, for the right person, at the right time, and in the right way—in every case and across multiple platforms** (please refer to Appendix A for differences among states in vision testing rates, and among ethnic groups, and ages.).¹¹

It is important to consider the role of cultural factors in health service, according to the 2019 WHO report, World Report on Vision.¹¹ For example, indigenous peoples are more likely to access eye care if it is culturally appropriate and well-integrated within their community-based health service.⁴⁵ Similarly, higher levels of patient engagement and satisfaction have been reported when similarities exist in language and/or ethnicity between patients and health care professionals.⁴⁶ In some cultures, gender-sensitivity may arise when care is provided by a health care worker of the opposite gender.

For children, a foundation for equity requires:⁴⁷

- creating systems and supports that improve adherence to recommended vision assessments and interventions
- reimbursement strategies for sustainable, in-school vision care programs, and
- increased uniformity of state-level policies on early detection and surveillance of vision disorders (Appendix B).

These foundational efforts can mitigate longstanding inequities and long-term systems change in children's vision.³⁷

Vision Screening in Preschool and School-Aged Educational Settings



Early childhood education programs and schools are ideal places for public health initiatives, as many children can be reached at one time. Educators, health, and other staff in early childhood programs, as well as school nurses, can be leaders in advocating for and providing screening services and referrals to eye care professionals for diagnosis and treatment. Educators recognize the powerful link between vision and learning, not only for school readiness and reading activities, but also for classroom behaviors and participation.

Supporting children’s health and development during pre-school years is critical as a foundation for learning and well-being in later years. The National Expert Panel to the NCCVEH recommends an annual professional eye examination for children aged 36 to 72 months. An examination at least once during these ages is the minimum standard, with annual vision screenings preferred.⁴⁴

The NCCVEH at Prevent Blindness has developed a framework for a comprehensive vision screening process. The 12 Components of a Strong Vision Health System of Care (<http://preventblindness.org/12-components-of-a-strong-vision-health-system-of-care/>) begins by providing parents and caregivers with educational materials on the importance of good vision for their children now and in the future and scheduling an eye examination when their children do not pass vision screening. This framework includes information on evidence-based tools and procedures and, as a final step, conducting an annual

evaluation of an entity’s vision health program.

The NCCVEH has partnered with the National Association of School Nurses (NASN) to provide national guidance to school nurses and others responsible for screening the vision of preschool- and school-aged children based on the 12 components. This NCCVEH/NASN guidance webpage—Vision and Eye Health (<https://www.nasn.org/nasn-resources/practice-topics/vision-health>) addresses vision screening within the broader context of comprehensive vision and eye health. Overarching goals of this national partnership are to standardize approaches to vision health and follow-up eye care for students that do not pass vision screening.

The NCCVEH recommends using the 12 Components of a Strong Vision Health System of Care in vision screening programs (*Appendix C*) and the Annual Vision Health Program Evaluation Checklist (<https://nationalcenter.preventblindness.org/wp-content/uploads/sites/22/2020/07/Vision-Screening-Program-Checklist.pdf>).

Treatment and Follow-up

As difficult as it is to determine reliable rates of vision screening, it is even more difficult to determine population-based estimates of the percentages of children receiving diagnostic examinations and treatment after receiving a referral for an eye examination from a vision screening program. No national standardized system is in place to track screening, follow-up to eye care, or sites where screenings occur³⁷ (Box 3). A system is sorely needed both to provide population-level data and to ensure that individual children receive necessary eye care services.

In a study of vision screening within medical home settings, fewer than half of preschool-age children that did not pass the screening were referred for diagnostic examination.⁴⁸ Additionally, some children who receive referrals do not obtain the necessary care. In

one study, two thirds of children with referrals did not obtain further care.⁴⁹ Cost, access to providers, and parental awareness of the significance of vision disorders pose barriers to obtaining eye examinations and eyeglasses after a referral from a vision screening.^{50, 51}

Communities and states are developing innovative strategies for increasing the referral completion rate. Best practices are emerging that demonstrate the effectiveness of collaboration between the health care system, education programs/schools, and families. It is critical to address cultural differences, reading levels, fear of eye care costs and treatment, and other barriers faced by families. Read about some exciting state efforts in the **State Approaches to Ensuring Children’s Vision and Eye Health** section of this report.

Special Considerations

Some children are at higher risk for vision disorders. These children may need to be referred for an eye examination—even if they pass the vision screening—or should bypass screening and be referred directly to an eye care professional. Health conditions placing children at a higher risk of vision disorders include:

- visible ocular abnormalities, such as strabismus, and ptosis⁴⁴
- systemic medical conditions or the use of medications associated with eye disorders,⁴⁴ such as diabetes mellitus, juvenile idiopathic arthritis, and neurofibromatosis
- congenital infections, such as Zika virus,^{22,52}

cytomegalovirus,^{53,25} rubella, syphilis, and toxoplasmosis

- neurodevelopmental disorders such as autism spectrum disorders, cerebral palsy, Down syndrome, hearing impairment, developmental delay, cognitive impairment, cognitive impairment, and speech delay⁴⁴
- premature birth (prior to the 32nd week of pregnancy)⁴⁴
- neurological concerns; e.g. post-concussion
- family history (parent or siblings) of strabismus or amblyopia⁴⁴
- intrauterine alcohol or drug exposure (including methadone).⁵⁴



National Guidance and Recommendations

The conditions in this list are associated with a number of eye and vision disorders that affect learning and development. These conditions include refractive errors, loss of binocular vision (depth perception), strabismus, amblyopia, cataracts, intraocular inflammation, optic nerve atrophy, and cerebral visual impairment. Additionally, any parent, caregiver, or teacher concerned about a child's vision⁴⁴ should refer him or her for an eye examination.

While the list of high-risk medical conditions cannot include every possibility, we recommend that for the listed conditions and other similar health conditions, a comprehensive eye examination

should be conducted even if a child passes a screening. For example, a child with attention deficit hyperactivity disorder may have challenges with screening. Waiting to re-screen at a later time delays possible treatment that may help a child who is struggling to pay attention in school. Each vision screening program should review how it evaluates children at high-risk for vision disorders and develop a strategy for referrals. Health professionals should determine the need for ongoing care for all children to be seen by a medical specialist. Note that 6% of children with special health care needs have unmet vision needs,⁵⁵ indicating the need for systems of referrals for comprehensive eye examinations.

In a 2016 report, [Making Eye Health a Population Health Imperative](#), the National Academies of Sciences, Engineering, and Medicine (formerly the Institute of Medicine) called for increased consensus and uniformity in clinical practice guidelines among diverse stakeholders (including eye care professionals, other care providers, and public health professionals) addressing children's vision and eye health.²¹ The report promotes development of a comprehensive public health approach to vision that incorporates evidence-based vision screening procedures along with access to comprehensive eye care for those who do not pass a vision screening. As such, it is important to be aware of national recommendations that drive vision and eye health practices in various settings, ensure that procedures are being implemented, and promote measures of accountability if improvement in the

national coordination of vision health for children is to occur.

Primary Health Care

Currently, organizations such as the American Academy of Pediatrics and its Bright Futures⁵⁶ and the American Academy of Ophthalmology Preferred Practice Patterns⁵⁷ provide national policies and guidelines for vision screening and eye health as a part of primary health care. The U.S. Preventive Services Task Force also recommends vision screening at least once for children between the ages of 3–5.⁸ National pediatric preventive care guidelines include vision screening by pediatricians at well-child visits with quantitative measurement of vision yearly at ages three through six and then



at regular intervals through late adolescence.³⁹ These guidelines are intended for implementation of a vision and eye health program within a clinical health care setting.

Medicaid offers enrolled children a comprehensive benefit called Early and Periodic Screening, Diagnostic and Treatment (EPSDT), generally referred to as a “well-child check-up” by a primary care provider. At a minimum, EPSDT must include an age-appropriate vision assessment (including a vision screening) and services to correct or ameliorate vision disorders, including eyeglasses.⁵⁸ If a screening identifies a possible vision disorder, a referral to an eye care provider and further evaluation is in order. EPSDT requires Medicaid coverage of necessary diagnostic and treatment services, including further testing and eyeglasses through a comprehensive eye examination, even if the services do not cover adults.

Pediatric vision care is an essential health benefit under the Affordable Care Act (ACA). All new individual and small group health insurance plans, regardless of whether they are part of the ACA’s Health Insurance Marketplace (also called “Exchanges”), must provide coverage of vision services for children younger than 19. Coverage for essential health benefits is defined by a “benchmark plan” in each state. If the benchmark plan does not include pediatric vision services, the benefits provided by either the Federal Employee Dental and Vision Insurance Plan (FEDVIP) or the state’s Children’s Health Insurance Program (CHIP)

are used as supplements. A majority of states (42, including the District of Columbia) choose to use FEDVIP, which covers an annual eye examination and one pair of eyeglasses per year. (*Please refer to Healthcare.gov to learn the most current policies.*)

Public Health

National public health goals include early detection and intervention for vision disorders and are featured in Healthy People 2020^{38,59} and publicly issued drafts of the Healthy People 2030 goals. The current Healthy People 2020 objectives focus on evidence-based interventions to preserve sight and prevent blindness. Objectives include addressing screening and examinations, early detection and timely treatment of eye diseases and disorders, injury prevention, and the use of vision rehabilitation services.⁶⁰

The NCCVEH has provided guidelines for use by public health professionals, primary health care providers, and non-clinician providers of vision screenings.^{36,37,44} These recommendations were developed for the NCCVEH by a National Expert Panel (NEP) composed of leading professionals in ophthalmology, optometry, pediatrics, public health, and related fields. The NEP conducted a consensus review process of the published literature (through February 2014) that included research, reviews and policy statements, and consulted with program directors in developing a vision health program infrastructure. The NEP also supplemented their



literature evaluation with the group’s clinical experience where necessary. The NEP specifically addressed vision-screening methodology and a system of care needed to ensure appropriate, subsequent referral for an eye examination by an optometrist or ophthalmologist. The vision screening guidelines are currently being updated and will be maintained at: <https://nationalcenter.preventblindness.org/>.

Head Start

The Office of Head Start recognizes the role that healthy vision plays in proper child development and currently requires all children in Head Start and Early Head Start programs to be screened for vision disorders within 45 days of enrollment.³⁰ Implementation of this program performance standard requirement is left for interpretation at the program level in regard to training, educating staff on common vision disorders, appropriate vision screening materials and methods, as well as ensuring follow-up to eye care when children are referred.

Children with Disabilities: The Individual with Disabilities Education Act

The Individuals with Disabilities Education Act (IDEA)⁶¹ under Part B ensures that all children with disabilities ages 3–21 are entitled to a free appropriate public education to meet their unique needs and prepare them for further education, employment, and independent living. Under Part C of the IDEA, states ensure that appropriate early intervention services are available

to all infants and toddlers with disabilities in the state and their families (some services are provided at no cost). Under Part C, states are required to develop a “rigorous” definition of an infant or toddler (ages birth through age 2 years) with a developmental delay disability and diagnosed physical or mental conditions with a high probability of developmental delay, which include sensory disorders such as vision (20 CFR §303.21). When an infant or toddler is determined to be eligible, an IFSP (Individualized Family Service Plan) is developed. In addition to a variety of other services determined by the IFSP team, early intervention services for children with vision disorders include:

- Evaluation and assessment of visual functioning, including the diagnosis and appraisal of specific visual disorders, delays, and abilities that affect early childhood development (20 CFR §303.13[b][17][i]);
- Referral for medical or other professional services necessary for the habilitation or rehabilitation of visual functioning disorders or both (20 CFR §303.13[b][17][ii]); and
- Communication skills training, orientation and mobility training for all environments, visual training, and additional training necessary to activate visual motor abilities (20 CFR §303.13[b][17][iii]) .

Under Part B, for children ages 3 to 21 years, a disability is defined as having any of a number of conditions including visual



impairment that includes blindness that, even with correction, adversely affects a child's educational performance. If a determination is made that a child has a disability and needs special education and related services, a children must have an Individualized Education Plan (IEP). Appropriate services provided to blind or visually impaired children include teaching children the following, as appropriate:

- Spatial and environmental concepts and use of information received by the senses (such as sound, temperature and vibrations) to establish, maintain, or regain orientation and line of travel, e.g., using sound at a traffic light to cross the street, (20 CFR §300.34[c][7][ii][A]);
- Use of a long cane or a service animal to supplement visual travel skills or as a tool for safely negotiating the environment for children with no available travel vision (§300.34[c][7][ii][B]);
- To understand and use remaining vision and distance low-vision aids (§300.34[c][7][ii][C]); and
- Other concepts, techniques, and tools (§300.34[c][7][ii][D]).

Note that each state has different Part C and Part B definitions. For more information on eligibility for vision services in Part B, please see <https://sites.ed.gov/idea/files/letter-on-visual-impairment-5-22-17.pdf>

School Nursing Services

In 2010, the Institute of Medicine (now the National Academy of Science, Engineering, and Medicine) released *The Future of Nursing: Leading Change*, a landmark report.⁶³ The report made four recommendations, of which three are relevant to improving vision health in children:

1. Nurses should practice to the full extent of their education and training. This includes advocating to influence better processes and outcomes of vision care in schools and communities.
2. Nurses should be full partners along with physicians and other health professionals, in redesigning health care in the U.S.
3. Effective workforce planning and policy making require better data collection and information infrastructure.

The role of the school nurse is integral for vision screening and other common health conditions in children. "A comprehensive vision health program is a school nurse intervention that makes a significant measurable difference in a student's overall health and learning."⁶³

State Approaches to Ensuring Children's Vision and Eye Health

Prevent Blindness established the NCCVEH in 2009 to strengthen the nation's public health system for children's vision. Over the past 10+ years, the NCCVEH has reshaped children's vision health systems to ensure that no child's future is limited by an undiagnosed vision problem. **In 2019 alone, the NCCVEH impacted more than 13 million children through improved access to eye care, uniformity in practice and policies, and increased education and awareness of the role of vision in childhood.**

The NCCVEH works with states to develop comprehensive and sustainable vision and eye health programs and serves as a catalyst to improve public health systems of care to support children's vision. The NCCVEH has provided support to programs in 29 states through grants and technical assistance. The NCCVEH recognizes and celebrates the important work done by states to improve the vision and eye health of all children, particularly those at highest risk of vision disorders and limited access to screening and eye care. States have implemented policies, guidelines, and systems-change actions. These state-level best practices guide the U.S. and other countries worldwide toward better vision health.

This report highlights several unique examples of the ways states have improved systems of vision screening and eye care for young children. State actions presented here were developed through two NCCVEH pilot projects, Children's Vision Quality Improvement Project

(QI Project) (<https://nationalcenter.preventblindness.org/childrens-vision-quality-improvement-project/>), and the current *Better Vision Together* (<https://nationalcenter.preventblindness.org/better-vision-together/>) Community of Practice. The goal of the Children's Vision Quality Improvement Project was to support the development of comprehensive children's vision and eye health systems. Overviews from two states, Arizona and Ohio, are included in the following section. Better Vision Together teams are developing best practices that are shared on the project's website.

Initiatives developed through states' participation with NCCVEH projects include:

- enlisting primary care providers to improve vision screening and eye care
- engaging families in the development of culturally competent parent-education messaging about children's vision
- working with and supporting school nurses in providing quality periodic vision screening of school-age children
- testing parental responses to referral letters and other communication when their child does not pass a vision screening to encourage follow-up to eye care
- development of educational materials and forms for eye care professionals to complete and return to schools in order for teachers and school nurses to assist with implementing



- prescribed vision treatment plans
- reviewing screening practices for young children (birth to age 8) with a special focus on children from birth to age 3, and publishing a state blueprint for a comprehensive and aligned system of vision screening
- implementing a vision screening system with data collection
- improving the system of vision examinations and care for children receiving early intervention services

We issue a “call to action” to all states to learn from peers, replicate successful interventions, and share lessons learned with the NCCVEH. Tell us about your successes by contacting Donna Fishman, Director, NCCVEH at dfishman@preventblindness.org.

To read the complete state stories, please visit
<https://nationalcenter.preventblindness.org/state-approaches-childrens-vision>

State Highlights

ARIZONA



The Eyes On Learning Vision Coalition of Arizona consists of state, local, and national organizations that share a commitment to vision health and learning success for all Arizona children. The Coalition was part of NCCVEH's Improving Children's Vision: Systems, Stakeholders & Support Collaborative project (QI Project) and currently participates in the Better Vision Together Community of Practice. During the QI Project, the coalition engaged primary care providers, including federally qualified health centers (FQHCs), to improve vision screening and care. The project engaged families in focus groups to develop culturally appropriate parent education messaging on children's vision. This resulted in significant increases in vision screening, along with the utilization and distribution of a Photoscreening Implementation Checklist³⁸ which guides providers on implementing a quality screening and referral

process, as well as resources for families about their child's vision health. The engagement of family partners in guiding the work to improve parent education about children's vision led to the development of a social media messaging and print media campaign in English and Spanish with the message "*Children don't know what they can't see.*" Videos are being developed in 2020.

Links:

<https://nationalcenter.preventblindness.org/childrens-vision-quality-improvement-project/>

<https://nationalcenter.preventblindness.org/better-vision-together/>

<https://www.bestcare4kidsaz.com/wp-content/uploads/2018/07/PhotoScreener-Implementation-Checklist.pdf>

<http://www.eyesonlearning.org/resources/>

MASSACHUSETTS: Early Intervention



The MA Department of Public Health has the largest Early Intervention (EI) program in the nation, enrolling 20% of all children aged birth to 3. Eighty percent (80%) of the children who are served in the program have a developmental delay. By state law, MA requires all children with a neurodevelopmental delay to have proof of a comprehensive eye examination upon entering public kindergarten. Children's Vision MA (CVMA) supported system improvements and raised awareness among Early Intervention

Department policy makers of the impact of untreated vision disorders in children enrolled in early intervention programs. CVMA members initiated multiple and widespread outreach efforts that included: meeting with state officials to highlight the vision connection, troubleshoot potential barriers and discuss avenues for information dispersal around childhood vision care. This led to meeting presentations, annual conferences, wide distribution of CVMA resources, etc. For

example, the parent/caregiver education resource, “Is My Child Seeing Clearly?” was translated into six languages and “Is my Child Seeing Clearly?” was distributed across Massachusetts (<https://childrensvision.preventblindness.org/fact-sheets/>)

Finally, more children received vision-status evaluations through a revision of the Individualized Family Service Plan Handbook. (<https://www.mass.gov/doc/ifsp-handbook/download>)

MASSACHUSETTS: Photoscreening



Under Massachusetts (MA) law, children entering kindergarten must pass a Department of Public Health (DPH)-approved vision screening within 30 days or provide proof of a comprehensive eye examination within the past 12 months. For preschoolers in a public school system, a vision screening is recommended by the DPH but not mandated, and private schools are currently exempt from any vision screening mandates. Children’s Vision MA led an effort to increase the early detection of vision disorders in children aged 3 to 5, by initiating a system of vision screening through schools in low-income and underserved towns of Eastern MA. Photoscreening devices were designated for use by three Regional Nurse Consultants, who facilitated their regions’ operator training and transported the device to public and private preschool districts where needed. Through this initiative, increased numbers of children received a vision screening, more MA preschools developed evidence-

based screening programs and state mandated screenings were completed earlier in the school year. There was success in parental education on vision screening results and the need for eye care when applicable. Half of the school districts reported vision screening of children aged 3 to 4 for the first time—a group not often or regularly screened. Several private preschools that did not previously conduct vision screening accessed and used the photoscreener for the first time. Over 100 school nurses received training and up-to-date information on vision screening and the DPH has committed to ongoing collection, including data on vision care treatment and follow-up.

MINNESOTA



The Minnesota Department of Health, Child and Adolescent Health (DHCAH) unit provides a vision screening procedures manual used to train those who perform vision screening across the state including personnel from clinics, local public health departments, Early Childhood Screening (for children ages 3–5 and pre-K screening), Head Start, and schools. In 2015, an expert panel created new vision screening guidelines for schools in Minnesota based on national recommendations. The new manual includes guidelines for standardized screening, with a focus on ensuring that children and youth in all settings are screened for visual acuity in accordance with recommendations. This led to an expansion of the

usage of these guidelines within clinic systems to inform staff of policies and training in visual acuity screening. MN's vision screening program made a change in their Early and Periodic Screening, Diagnostic and Treatment program (EPSDT) which now references the updated guidelines under the Child & Teen Check-Ups schedule of age-related screening standards. MN's vision screening program also includes Minnesota Department of Health-led visual acuity screening training ten times per year in statewide locations.

Find guidelines at <https://www.health.state.mn.us/docs/people/childrenyouth/ctc/visioncreen/visionscrnman.pdf>

OHIO



Prevent Blindness Ohio (PBO) participated in the NCCVEH's **Improving Children's Vision: Systems, Stakeholders & Support Collaborative** (<https://nationalcenter.preventblindness.org/childrens-vision-quality-improvement-project/>) project. PBO partnered with a public preschool system within the Knox County Educational Service Center (ESC) to increase the percentage of children who receive comprehensive eye examinations after not passing a vision screening. The ESC consists of four preschool locations that provide morning and afternoon classes. Knox County is predominately rural and located in central Ohio. The project developed new strategies for families to overcome common barriers to follow-up on referrals

for eye examinations. For example, the parent permission form for vision screening included an educational paragraph about the importance of children's vision health and school officials included a pair of youth safety sunglasses, another brochure, *Your Child's Sight*, and an activity book to take home. Follow-up with parents of students who had not received a comprehensive examination or had not shared the results with the school was conducted. Additionally, the school director sent a letter two months after the initial school screening and approximately two months later, the child's teacher contacted the family either face-to-face or via phone call. Finally, a brief survey to gather feedback was mailed to those parents that did not respond. Results indicated that

communication from the teachers was a very effective intervention, the initiative led to a stronger partnership between the schools and the Ohio Department of Health, and strong involvement by parent partners had positive results. To sustain this effort beyond the quality

improvement (QI) study project, the preschool teachers at all four sites were trained as certified preschool vision screeners and were provided vision screening equipment approved by the NCCVEH at Prevent Blindness and the Ohio Department of Health.

WISCONSIN



Wisconsin currently has no state legislation requiring vision screening for children. Prevent Blindness Wisconsin is a leader in the state in providing vision screening as part of children's vision and eye health system of care and recognizes that state-led systems are imperative for children to receive vision screening and eye care through collaborative efforts between schools, early childhood education providers, and the health and public health sectors. In 2012, the *Blueprint for a Comprehensive and Aligned System for Screening and Assessment of Young Children*³⁹ (https://www2.waisman.wisc.edu/cedd//pdfs/Healthy_Children_Blueprint_16.pdf) was issued. Prevent Blindness Wisconsin along with universities and several state agencies comprised the Wisconsin Early Childhood Collaborating Partners Healthy Children Committee, which developed a common set of principles to offer guidance in finding commonalities in screening and assessment processes across systems. The development of a set of common principles is essential to

the implementation of cross-sector screening and assessment practices regardless of where young children spend their time or which programs and services they access.

The Committee reviewed screening practices for young children (birth to age 8) with a special focus on children from birth to age 3. The Blueprint addresses vision screening protocols, the Wisconsin Mandate, the current status of vision screening in Wisconsin, and the actions recommended to address existing gaps. To enhance integration of principles into practice, fact sheets were created for each area of screening and assessment listed on the fact sheet, Critical Time Periods for Early Childhood Screening and Assessment: Visual Chart and Narrative, in the Blueprint.

For the complete stories from each state, please visit <https://nationalcenter.preventblindness.org/state-approaches-childrens-vision>.

Building a Comprehensive State Vision Health Program

Understanding the importance of a comprehensive system to address vision and eye health while learning from states' successes and challenges is just the beginning of our efforts. Early detection interventions, cultural competencies, caregiver and professional education, access to eye care, population-based data systems, and measures of accountability are the foundation of

a comprehensive system to ensure children's vision and eye health. Assessing and building a strong program that meets the unique needs of a state is the next step. Two tools provided by the NCCVEH to guide discussions are: *Analyze Your State's System for Children's Vision (Box 5)* and *Creating Effective Systems (Box 6)*. These tools are also applicable for regional or local children's vision and eye health efforts.

Box 5. Analyze Your State's System for Children's Vision

The following questions may help you assess the strength of your own state's approach to ensuring children's vision and eye health:

- Is vision screening for children mandated by law? At what ages and frequency?
- Who is doing the vision screening? Who trains vision screeners? Are there certification or training requirements for screeners?
- Are the results of vision screening and eye examination outcomes communicated to the child's medical home/primary health care provider?
- Is there a standard protocol for referrals? Who follows up to ensure referred children access needed eye care? Is this follow-up process/protocol in place for all children, or only segments of the state's population?
- Does the state regulations and training reflect current evidence-based vision-screening techniques, instrumentation and periodicity?
- Are there populations that are being missed, are unable to access eye care, or need special considerations? How is your strategy improving health equity? Is your state addressing the needs of populations that are missed: immigrants and refugees, ethnic communities, non-English speakers, and those without health insurance?
- What percentage of children aged 3–5 receives a vision screening or eye examination?
- Who monitors the quality of vision screening programs?
- Who maintains the data on children's vision in your state? Is there statewide tracking of vision screening and follow-up? If so, does it integrate systems, sites, and providers to support population-based (all children) data?

Note: These guidelines were developed by a National Expert Panel convened by NCCVEH.

BOX 6 Vision Screening for Children 36 to <72 Months: Recommended Practices⁴⁴

This article provides recommendations for screening children 36 to <72 months for disorders of the eyes and visual system, which include primarily amblyopia, strabismus, significant refractive error, and risk factors associated with these disorders. Guidance includes periodicity, methods and tools, and referral protocol. Specifically:

- Screening should occur annually (best practice) or at least once (acceptable minimum standard) between the ages of 3 and 6 and periodically throughout the school years for children who do not receive comprehensive eye examinations.
- Vision screening personnel should be trained and certified, with recertification completed every 3 to 5 years.
- Vision screening programs require planning for acquiring and maintaining the necessary space and equipment.
- Screening results must be recorded and communicated to the child's parents, medical home/primary care provider, and school, along with the necessary state agency and subsequent referrals to an ophthalmologist or optometrist for examination and treatment when indicated.

Note: Visit <https://preventblindness.org/vision-screening-recommendations/>

Vision and Eye Health in Children³⁶ to <72 Months: Proposed Data System³⁷

This article provides a rationale for developing an integrated data system for recording vision screening and eye care follow-up outcomes in preschool-aged children. The expansion of currently existing, or

developing integrated health information systems that would include child-level vision screening data, as well as referral records and follow-up diagnosis and treatment, is consistent with the proposed national approach to an integrated health information system. Recommendations include:

- inclusion of vision screening data in an integrated health information system
- integration of vision data with other child health data at the state level
- characteristics of an effective child vision health data system that includes data flow, demographic information required for a robust system, and specific vision care data elements.

Note: Visit <http://preventblindness.org/data-collection-guidelines/>

Vision and Eye Health in Children 36 to <72 Months: Proposed Data Definitions³⁶

This article recommends a standardized approach for measuring progress toward national goals of improving preschool children's eye health. The article offers numerators and denominators for the following:

- performance measures for vision care
- performance measures for children with diagnosed neurodevelopmental disorders
- performance measures for follow-up and treatment
- pre-school vision care performance measures.

Note: Visit <http://preventblindness.org/performance-measures-guidelines/>



The NCCVEH has developed model legislation to assist states in working with legislators and governmental agencies to create sustainable systems for comprehensive vision health for children (*Appendix D*).

Call to Action

Much work remains in ensuring a strong vision and eye health system for children in the U.S. Over the past 10+ years, the NCCVEH has led the charge to engage diverse stakeholders, collect and disseminate evidence, and provide education or technical assistance to governments, school districts, vision coalitions, and other organizations in almost every state (Box 7).

States and communities are on the front line in working to improve the screening and vision care rates for children, in educating parents and caregivers on the need to follow-up on referrals for eye care, and in helping develop early detection systems using evidence-based methodologies and tools in early childhood education. Quality improvement initiatives are needed in practice, data collection, and surveillance. The NCCVEH continues to advocate for state- and federal-level surveillance systems for vision health. Communities of practice, such as the NCCVEH's Better Vision Together (<https://nationalcenter.preventblindness.org/better-vision-together/>), develop grassroots and state-level strategies that are tested, measured and documented. The NCCVEH recommends the continuation of grassroots/local and state efforts to follow these steps:

1. Develop culturally competent, comprehensive, vision screening programs utilizing the 12 components.
2. Develop data collection systems utilizing the NCCVEH recommendations.
3. Advocate for the inclusion of vision in state maternal and child health and education plans and objectives.

4. Develop community- and state-wide children's vision initiatives and involve parents and caregivers in vision teams.
5. Initiate quality improvement projects or add children's vision to existing quality improvement projects.
6. Plan and implement professional education programs for children to receive evidence-based screening, referral programs, and comprehensive eye examinations when indicated.
7. Develop and implement state legislation or guidelines for vision screening and referral processes for preschool and school-aged children.
8. Adopt the use of the assessment tool, 18 Vision Development Milestones From Birth to Baby's First Birthday. (https://nationalcenter.preventblindness.org/wp-content/uploads/sites/22/2020/05/18-Key-vision-questions-to-ask-in-year-1_version-5.27.2020.pdf)
9. Improve equity/access to vision screening, eye care, and treatment by creating vision information materials for parents and caregivers. Ensure the materials are available in languages spoken by members of the target communities. Provide access to translators as needed when non-English-speaking families visit eye care specialists.
10. Encourage eye care specialists at the community- and state-level to accept payment vouchers (from private companies, etc.) or Medicaid.



The NCCVEH needs allies in the public health, education, medicine, and early childhood fields to commit to strengthening screening protocols, improve access to diagnostic examinations and treatment, and bolster capacity for surveillance and performance measurements in order to grow and support a comprehensive approach to children’s vision and eye health.

This objective must begin by educating all sectors that serve children of the vital importance of good vision. As vision develops over time, the need for early identification is continuous from early childhood through teen years. Our messages are critical and need to be universally communicated.

- Visual functioning is a strong predictor of academic performance in school-aged children.
- Healthy vision plays an

important role in fine and gross motor skill development.

- Low academic achievement predicts poor health and good vision is needed for academic achievement.
- Childhood vision disorders may continue to affect health and well being throughout adult years.
- Good vision is key to doing well in school.
- 70% of children in the U.S. are receiving appropriate vision screening or eye examinations.
- Over 90% of vision disorders among children in the U.S. are either preventable or treatable. Early detection is critical.

All sectors that work with children are needed to join the effort to preserve sight and include:

- Families and caregivers

- Public health leaders
- Ophthalmologists, optometrists, and other eye care specialists
- Primary health care providers (including pediatricians, community health centers, and other “medical homes”)
- Early childhood educators and care organizations and programs
- Schools and school nurses
- Early care and education agencies
- Family education and advocacy organizations
- Community organizations
- Insurance providers, Medicaid/CHIP, and other funders
- Epidemiologists and health information system specialists
- Legislators and other policy makers



We can all agree that children are our future.

Help us forge a stronger vision and eye care system that ultimately ensures the health and well-being of all children in your state.

Box 7. A Bright Future for NCCVEH

“First, it is exciting to see that the Center has reached our 10th anniversary and has so many accomplishments – however, we have only scratched the surface of what is needed for children and vision issues. Second, we are amazed at the collaborations that have come together under the umbrella of the Center including government from the federal level on

through the local levels, non-profits, affiliates, parents, experts and even patients. Lastly, we look forward to continuing all of the efforts to cover children of all ages.”

Sandra Block OD, Med, MPH, CoChair,
NCCVEH Advisory Committee 2018–Current

Appendix A. Vision Screening Percentages by State, Age, Race and Ethnicity by Ages 0–5, 6–11, and 12–17

The data presented here were analyzed by the NCCVEH using the 2016–2017 combined National Survey of Children’s Health results. The % answering “yes” to the question: *Has (child) [ever (0–5)/during the past 2 years (6–17)] had his or her vision tested with pictures, shapes, or letters?*

State	0–5 years old % (National = 38.9%)	6–11 years old % (National = 85.85)	12–17 years old % (National = 83%)	Hispanic %	White, non-Hispanic %	Black, non-Hispanic %	Asian, non-Hispanic %	Other, non-Hispanic %
Alabama	45.2	86.7	82.3	61.5	69.1	77.9	–	60
Alaska	43.6	89.6	81.9	68.7	69.6	–	67.7	75.6
Arizona	31.4	84.4	76.9	64.6	69	–	50.3	51.7
Arkansas	36.3	84	78.3	69.4	65.9	67	57.1	73.4
California	35.9	86.4	84.6	70	71.7	68.5	58.1	65.9
Colorado	39	85.6	81.5	65.3	71.2	65.6	66.3	79
Connecticut	46.2	89.8	85.8	71.9	78.2	70.1	74.3	71.4
Delaware	39.8	91.9	91.3	73.3	74.9	78.1	57.9	59.8
District of Columbia	42.8	81.8	86.8	66.9	54.4	73.8	46.8	57.5
Florida	30.6	86.6	79.5	63.2	69.9	70.2	74.1	58
Georgia	44.9	85.7	77.4	77.2	69.8	75.3	47.4	60
Hawaii	44.5	84	76.4	64.9	68.6	–	66	70.6
Idaho	25.5	80	74.1	55.2	60.8	–	–	63.6
Illinois	32.8	85.7	79	66.5	67.8	61.3	64.9	76
Indiana	35.2	82.6	84.1	67.7	66.5	77.4	69.1	56
Iowa	40.7	84.9	84.6	73.8	71.4	–	42.1	65.3
Kansas	39.2	81	89.5	59.4	71	77.1	72.6	73.1
Kentucky	36.3	79.3	83.3	65.2	66.7	65.3	51.9	55.6
Louisiana	47.9	82.3	76.9	74.3	63.9	78.1	–	58.8
Maine	40.1	85.6	79.7	85.9	67.1	–	–	72.8
Maryland	37.2	81.3	86.3	74.4	65.1	72.7	70.8	69.7
Massachusetts	46	85.7	88.5	72.2	75.3	65.9	71.9	76.2
Michigan	41.1	88.2	88.4	68.6	72.1	79.6	75.7	73.9
Minnesota	48.5	88.6	84.3	73.3	73.9	66.5	75.4	76
Mississippi	34.9	82.8	82.6	60.4	63.4	72	–	67.6
Missouri	37.8	86.3	80.8	71.1	66.5	78.6	58.5	63.1
Montana	38.8	85.2	81.3	71.7	67.8	–	–	67.5
Nebraska	32.7	88	84.1	58.3	70.2	77.9	23.6	76.5
Nevada	29	72.1	79.1	61.8	61.7	50.8	58.1	58.9
New Hampshire	38.1	89.6	82.4	65.2	71.3	–	85.4	57
New Jersey	43.2	89	88	76.7	76.2	66.8	68.2	67.3
New Mexico	37.5	81.7	78.8	68.9	67.3	–	–	58.2
New York	45.3	89.8	85.6	72.1	74	83.1	71.7	59.7
North Carolina	50.5	86.3	82.2	71	77.9	67.9	75	68.6
North Dakota	37	86.6	82.8	60.5	65.7	–	–	71.2
Ohio	36.8	83.4	84.4	64.8	70.1	68.3	48.2	80.2
Oklahoma	34.5	88.4	80.1	59.8	65.6	64.5	61.7	71.6
Oregon	34.7	88	77.5	70.7	65.3	–	70	71.4
Pennsylvania	41.1	86.2	88.1	75.9	71	68	80.6	69.8
Rhode Island	41.3	94	86.1	74.4	76	81.4	72.1	56.4

Appendix A. (continued)

State	0-5 years old % (National = 38.9%)	6-11 years old % (National = 85.85)	12-17 years old % (National = 83%)	Hispanic %	White, non-Hispanic %	Black, non-Hispanic %	Asian, non-Hispanic %	Other, non-Hispanic %
South Carolina	34.1	82.4	80.5	86.7	63.8	63.4	65.5	72.4
South Dakota	30.7	86.3	79	83.1	63.6	–	–	58.2
Tennessee	43.1	84.1	83.3	87.7	68.1	73.5	53.4	71.5
Texas	38.7	84.3	82.7	69.9	67.7	71.9	67.1	67.2
Utah	34.8	88.1	79.7	70.8	66.6	–	–	63.4
Vermont	40.9	84.5	81.2	78.8	69.4	–	86.7	50.5
Virginia	46.8	86.1	84.9	74.9	73.2	67.8	78.1	75.7
Washington	36.2	88.6	81.7	77.9	64.8	73.4	65.2	71.4
West Virginia	43.5	86.5	80.8	82.6	69.2	–	–	68
Wisconsin	33.4	87.1	86.7	67.4	70	83.5	59	67
Wyoming	51.8	90.9	87.5	79.5	75.3	–	–	76.8

Source: Child and Adolescent Health Measurement Initiative, 2019.¹⁸



Appendix B. Vision and Eye Health Requirements by State

The information in the chart below was compiled based on information available at the time of publication. States with a Y means that there is legislation, rule, code or requirement for vision screening or an eye examination. Guidelines or recommendations, unless indicated as rules in the code, are not included in this chart but many states that have no legislation or requirements do have guidelines and some state allocate/provide funding for vision screening. We encourage readers to reference the most current published legislative code and recommendations and guidance from your state public health and/or education departments as state policies can change. At the time of publication we are aware of several states reviewing current requirements; this is indicated in the “Other Information” column.

The NCCVEH thanks our partner, The Wilmer Eye Institute at Johns Hopkins School of Medicine, for their research of state codes.

STATE	Pre-School	School-Age	Frequency of Required Screening	Other Information
Alabama	N	N	No state requirements	
Alaska	N	Y	Upon school entrance and at regular intervals determined by the school district	
Arizona	Y*	Y	First entry to school and at no more that 2 additional grade levels, students receiving or considered for special education services, students at the school's discretion from other grade levels, students for whom teachers requested a screening and have not been screened in the past year, students who are not reading at grade level by third grade	*Required if a public or charter school offers a preschool program; child will be screened upon entry. Guidance in development for school-age children
Arkansas	Y*	Y	Public pre-K K, grades 1, 2, 4, 6, 8 transfer students, referrals	*Required if a public school offers a preschool program Requires follow-up eye exam after any failed screen
California	N	Y	K, grades 2, 5, 8 transfer students	New guidelines will be published in 2020
Colorado	N	Y	K, grades 1, 2, 3, 5, 7, 9, and children referred for screening	
Connecticut	Y	Y	Pre-K, K, grades 1, 3, 4 and 5 and required as part of a health assessment (received in community) upon first entry and for grades 6 or 7 and 9 or 10	
Delaware	Y	Y	First entry, K, grades 2, 4, 7, and 9 or 10, transfer students, students referred by teacher/administrator, students considered for special education, and driver education students prior to in-car hours	
District of Columbia	Y	Y	Universal Health Certificate is required annually for all students entering into Child Care Facilities, Head Start and DC public, private and parochial schools (includes a visual acuity screen)	

Appendix B. (continued)

STATE	Pre-School	School-Age	Frequency of Required Screening	Other Information
Florida	N	Y	K, grades 1, 3, 6 transfer students entering K-5	
Georgia	Y*	Y	Entry into school system	* Required if a public school offers a preschool program
Hawaii	Y*	Y	Physical exam required prior to entry into school system (preschool or school age) and at 7th grade; includes basic vision status	* Required if a public school offers a preschool program
Idaho	N	N	No state requirements	
Illinois	Y	Y	Annual screening for preschool children 3 years of age or older in any public/ private preschool or licensed child care facility, and in grades K, 2 and 8, transfer students, special education students, students referred by teachers- in all public, private and parochial schools	
Indiana	N	Y	Kindergarten or grade 1, grades 3, 5 and 8, students transferred in grades 3 and 8 and for students suspected of having a visual defect.	
Iowa	N	Y	At least once before enrollment in Kindergarten and again before enrollment in the 3rd grade. Vision screening shall be performed no earlier than one year prior to the date of enrollment in kindergarten or 3rd grade and no later than six months after date of enrollment	
Kansas	N	Y	At least once every 2 years while enrolled in public school	
Kentucky	Y	Y	Eye exams for all children ages 3-6 entering public preschool/Head Start/public school for the first time, performed by ophthalmologist or optometrist. Vision screening prior to first enrollment and entry into grade 6 (and grade 9 at the school's discretion)	
Louisiana	N	Y	Required annually for all students and in accordance with the schedule established by the American Academy of Pediatrics. Required for students suspected of having dyslexia	Guidelines currently under review
Maine	Y	Y	Preschool, kindergarten, grades 1,3,5,7, and 9	Distance acuity shall be screened in preschool, kindergarten and grades, 1, 3, 5, 7, and 9 Children who received a comprehensive eye examination from an eye care provider within the previous 12 months do not need to have a school vision screening

Appendix B. (continued)

STATE	Pre-School	School-Age	Frequency of Required Screening	Other Information
Maryland	Y	Y	Pre-K and K, upon entry, first grade, and grades 8 or 9	
Massachusetts	Y	Y	Upon entering kindergarten or once within the 12 months prior to K entry Required annually Kindergarten through grade 5 (or by age 11 in ungraded classrooms), once in grades 6 through 8 (or ages 12 through 14 in ungraded classrooms) and once in grades 9 through 12 (or ages 15 through 18 in ungraded classrooms)	Eye exam required for children with neurodevelopmental delay diagnosis; required for school entry for children that did not pass a screening in previous school
Michigan	Y	Y	Required before entry to Kindergarten, grades 1, 3, 5, 7, 9/in conjunction with driver training.	
Minnesota	Y	N	Early childhood developmental screening at least once before school entrance, targeting children who are between three and four years old (includes vision screening)	
Mississippi	Y	Y	Pre-K, and K within the first 45 days of the school year	
Missouri	N	N	No state requirements	Vision screening is recommended and the state issues guidelines
Montana	N	N	No state requirements	No current requirement but recommended on a periodic basis
Nebraska	Y	Y	Periodic, annual screening for ages 3–5 Eye exam required within six months prior to school or upon transfer, and grades 1–4, 7, and 10	
Nevada	N	Y	Required before entry in elementary school and one additional grade in elementary school, one grade in middle or junior high school, and one grade of high school, transfer students, special education students, and referrals	
New Hampshire	N	N	No state requirements	Recommends a complete vision exam for all students within first year of entry or transfer and screening for pre-K, K and 1st grade
New Jersey	Y	Y	Pre-K and required biennially for students in Kindergarten through grade 10	
New Mexico	Y	Y	Pre-K, kindergarten, grades 1 and 3, and transfers	
New York	Y	Y	Pre-K, Kindergarten, 1, 3, 5, 7, 10 and at any other time deemed necessary shall be screened for distance acuity	

Appendix B. (continued)

STATE	Pre-School	School-Age	Frequency of Required Screening	Other Information
North Carolina	Y*	Y	Kindergarten, or enrolling in the public school for the first time as part of health assessment within 12 months of entry	*Required for entry into Pre-K in Title I preschool programs
North Dakota	N	N	No state requirements	Some guidelines available
Ohio	N	Y	K or first entry, 1, 3, 5, 7, 9, 11, referrals.	Pre-K: state guidelines for screening are available
Oklahoma	N	Y	K, grades 1 and 3	
Oregon	Y	Y	Pre-K, K, age 7 or younger, grades 1, 2 or 3; 4 or 5; 7 or 8, 10 or 11; first entry into school, driver education student, upon entrance into special education, referrals	
Pennsylvania	N	Y	Required annually (K–12)	Guidelines under review
Rhode Island	Y	Y	Kindergarten or first entry (including preschool), grades 1–5, 7, and 9	Guidelines under review
South Carolina	N	N	No state requirements	Vision screening is recommended
South Dakota	N	N	No state requirements	
Tennessee	Y	Y	Pre-K, K, annually for 2, 4, 6 and 8; one year of high school is optional	
Texas	Y	Y	Required for first entry after age 4, grades 1, 3, 5, 7.	
Utah	N	Y	A completed vision screening form signed by a health care professional is required upon first entry for children less than nine years of age	New legislation passed in 2019. State Department of Health currently writing standards and procedures
Vermont	Y	Y	Pre-K, K, 1, 3, 5, 7, 9, 12	
Virginia	N	Y	Kindergarten, grades 2 or 3, 7, and 10	
Washington	N	Y	K, 1, 2, 3, 5, 7, referrals	
West Virginia	Y	Y	Prior to first entry, K, 2, 7	
Wisconsin	N	N	No state requirements	Allows individual schools and boards to request evidence of an eye exam, but does not require
Wyoming	N	N	No state requirements	

Please send us an email if you feel you have an update on vision screening regulations in your state. info@preventblindness.org

Appendix C. The 12 Components of a Strong Vision Health System of Care

The NCCVEH at Prevent Blindness has developed a framework for a comprehensive vision screening process. The 12 Components of a Strong Vision Health System of Care begins with providing parents and caregivers with educational material about the importance of good vision for their children now and in the future, as well as scheduling an eye examination when their children do not pass a vision screening. This framework includes information on evidence-based tools and procedures and ends with conducting an annual evaluation.

The NCCVEH partnered with the National Association of School Nurses (NASN) to provide national guidance to school nurses and others responsible for vision screening of preschool- and school-aged children based on the 12 components. This NCCVEH/NASN guidance webpage—*Vision and Eye Health*—addresses vision screening within the broader context of comprehensive vision and eye health. (<https://www.nasn.org/nasn-resources/practice-topics/vision-health>) Overarching goals of this national partnership are to standardize approaches to vision health and facilitate follow-up to eye care for students that do not pass vision screening.

The 12 Components of a Strong Vision-Health System of Care*

1. Ensure that all parents/caregivers receive culturally relevant and literacy-level

appropriate educational material on the importance of:

- a. good vision for their child now and in the future, and
- b. scheduling and attending an eye examination when their child does not pass a vision screening.

2. Ensure that a parent's/caregiver's written approval for vision screening includes permission to:

- a. share screening results with the child's eye care provider and primary care provider;
- b. obtain eye examination results for their child's school file to share with screening program to ensure the treatment plan is followed at school, Head Start, or at other locations, and;
- c. talk with the child's eye care provider for clarification of eye examination results and prescribed treatments.

3. Screen vision with age-appropriate and evidence-based tools and procedures, including optotypes (pictures) and/or instruments. In addition:

- a. Follow national referral and rescreening guidelines.
- b. Include vision screening training for your staff that leads to certification in evidence-based vision screening procedures;
- c. Ensure that contracted

screening organizations use evidence-based tools and procedures, follow national referral and rescreening guidelines, and clearly state that a screening does not replace an eye examination nor provide a diagnosis.

4. Create policies for screening or direct referral for children with special health care needs.

5. Rescreen or refer difficult-to-screen (untestable) children.

- a. Research suggests that untestable children are at least twice as likely to have a vision problem than children who pass a vision screening.⁵¹

- b. If you have reason to believe that a child may perform better on another day, consider rescreening the child within six months**; otherwise, refer untestable children for an eye examination.

6. Provide parents/caregivers with vision screening results in easy-to-understand language that respects cultural and literacy needs and provides steps for a prompt follow-up with an eye care provider.

- a. Provide written and verbal results.

7. Create a system for following-up with parents/caregivers to help ensure the eye examination occurs.

- a. Identify and remove barriers

Appendix C. (continued)

- to follow-up to eye care, such as transportation or a lack of knowledge of what to expect during the eye examination.
- b. Consider ways to engage parents in peer-to-peer conversations to encourage follow-up to eye care and adherence to prescribed treatments.
8. Link parents/caregivers with an eye care provider who specializes in the care and treatment of young children (optometrist or pediatric ophthalmologist).
9. Receive eye exam results for your school files.
10. Send a copy of eye examination results to
- the child's primary care provider.
11. Ensure that the eye care provider's treatment plan is followed.
- a. Develop a plan to assist with eye patching and/or glasses, as recommended by the eye care provider.
12. Annually evaluate the effectiveness of your vision health program by:
- a. comparing screening results to eye examination outcomes;
- b. identifying variations in referral rates among screeners;
- c. monitoring screening procedures to ensure
- they follow current recommendations;
- d. monitoring follow-up to eye care for children who do not pass vision screening or who are untestable; and
- e. identifying common barriers in follow-up to eye care and develop and implement solutions.
- * National Center for Children's Vision and Eye Health at Prevent Blindness and the National Association of School Nurses
- ** American Academy of Ophthalmology Pediatric Ophthalmology/Strabismus Panel, 2012
- For additional resources for each component, refer to the NASN website at <https://www.nasn.org/nasn-resources/practice-topics/vision-health>.



Appendix D. Prevent Blindness Model Children’s Vision and Eye Health Legislation

Proposed Template for Legislative Text

Prevent Blindness recommends the following template be used when developing state legislation that supports healthy vision in children. This can be modified to align with existing state laws.

Section 1. School-readiness Vision Health Requirements

(A) Each school (preschool, public, private, parochial, and charter) shall provide vision and eye health services to children as identified and outlined:

1. Students shall receive a vision screening upon initial entry to school and every two additional grade levels as prescribed by the administering department by rule. Children in preschool (as defined) should be screened annually. At the school’s discretion, a school may provide vision screening services to students in grade levels that are not identified by this or any existing rule.
2. Students for whom a teacher has requested a vision screening.
3. Students that are not reading at grade level by the third grade shall receive a vision screening.

(B) A vision screening conducted pursuant to this section does not satisfy a requirement for a medical professional to complete a vision screening of a child according to

established guidelines for pediatric care.

(C) A student is not required to submit to any vision screening required by this section if the parent or guardian objects and submits a statement of the objection to the school for any reason including that the student received a comprehensive eye and vision examination in the last 12 months or if the student has a current diagnosis of permanent vision loss.

(D) For the purposes of assisting and implementing the vision and eye health requirements established by this section, the administrative department or its delegate, subject to appropriated monies, may:

1. Develop and provide vision screening training to screeners designated in **subsection x** of this section.
2. Provide schools with materials the department determines by rule to be necessary for conducting parent/caretaker education, vision screenings, and follow-up referrals from vision screenings.
3. Compile any school vision screening and referral outcome data—with all individual identifying information removed—for review and analysis by researchers, public agencies or any foundation, and nonprofit organization or other organization that provides free approved vision screening services or training, grants for vision screening

services, and eyeglasses or examinations.

(E) The administrative department shall adopt rules pursuant to **title xx, chapter x** to carry out this section. The rules may not require materials and equipment specific to any one provider and shall include, where consistent with the requirements of this section, feedback from the public education programs required to implement the vision screenings. Rules adopted to carry out **subsection X** of this section shall be done in consultation with the state departments of education and health and may include a public comment opportunity as deemed necessary.

(F) The school district governing board or charter school governing body shall provide the vision screening results to the parent or guardian of each student who does not pass the vision screening within 45 days after the screening and shall comply with all applicable privacy laws. The results shall be provided in both a verbal and written format in the preferred language of the parent or guardian. The results shall identify that the student did not pass the vision screening and must receive a comprehensive eye and vision examination by a medical professional. The results shall state that a vision screening is not equivalent to a comprehensive eye and vision examination as conducted by a licensed optometrist or physician specializing and trained in the provision of comprehensive eye care.

Appendix D. (continued)

(G) A preschool, public, or parochial school district governing board, or charter school governing body that provides vision screening services shall provide annual data submissions to the department in an approved format that complies with student privacy laws.

The vision screening must be conducted by a certified vision screener trained in vision screening techniques according to the rules developed by the [insert here an appropriate state administrative department]. Medical or eye care professionals conducting vision screenings for school-entry purposes must also follow the approved techniques outlined in Section 2.

(H) Such techniques must follow nationally recognized evidence-based vision screening protocol, and include, at a minimum, the following:

1. Observation (ABCs: Appearance signs, Behavior signs, Complaint signs)
2. Recognition-distance visual acuity screening (utilizing either age-appropriate optotypes in a standardized design format or vision screening instruments demonstrating a scientific evidence base for the child's target age to be screened and deemed as best or acceptable practice by the Advisory Committee of the National Center for Children's Vision and Eye Health)
3. Appropriate follow-up and data collection procedures

(I) Children that fit into one of the following categories must provide proof of a comprehensive eye examination performed by a licensed optometrist or physician specializing and trained in the provision of comprehensive eye care chosen by the child's parent or guardian indicating any pertinent diagnosis, treatment, prognosis, recommendation and evidence of follow-up treatment, if necessary. Categories include:

- Students that receive or are being considered for special education services and have not been examined in the last 12 months;
- Children that fail to pass the vision screening;
- Children with readily recognized eye abnormalities;
- Children with systemic medical conditions or use of medication associated with eye disorders, such as diabetes mellitus, juvenile idiopathic arthritis, and neurofibromatosis;
- Children with neurodevelopmental disorders, such as autism spectrum disorders, cerebral palsy, Down syndrome, hearing impairment, developmental delay, cognitive impairment, cognitive impairment, and speech delay;
- Family history (parent or siblings) of strabismus or amblyopia; and
- Children born prematurely

(prior to the 32nd week of pregnancy).

Documentation of a comprehensive eye examination within the previous 12 months shall waive the requirement of an eye examination for those children who fall into the categories described herein.

(J) Any person who conducts an eye examination of a child in response to such child having not passed a vision screening given in accordance with the provisions of this section shall forward a written report of the examination results to the school health personnel and a copy of said report to a parent or guardian. Said report shall include, but not be limited to, the following in accordance with appropriate medical release of information:

- Date of the report
- Name, phone number, and address of the child
- Name of the child's school
- Type of examination
- A summary of significant findings, including diagnoses, treatment, prognosis, whether a return visit is recommended and if so, when
- Recommended educational adjustments for the child that may include (but not be limited to) the following: preferential seating in the classroom, eyeglasses for full-time school use, eyeglasses for part-time school use or any other recommendations

Appendix D. (continued)

- Name, phone number, address, email, and signature of the examiner.

For all students without documentation of a screening performed by an authorized screener or documentation of an eye examination performed within the previous 12 months, the school shall be responsible for providing a vision screening in accordance with procedures outlined in Section 1, conducted within **[insert here a reasonable time as determined by the state]**. For those children who do not pass the required vision screening, a comprehensive eye examination performed by a licensed optometrist or physician specializing and trained in the provision of comprehensive eye care shall be required of the child's family.

The family of the child must provide a copy of the comprehensive eye examination report to the school health personnel within **[insert here a reasonable time as determined by the state]**.

For families unable to financially provide a comprehensive eye examination for the child... **[Insert here a statement regarding state funding designated for families of children who are unable to afford them]**.

[The following section should be included where an appropriate oversight body does not exist.]

Section 2. State Children's Vision and Eye Health and School Readiness Commission

A State Children's Vision and Eye Health School Readiness Commission (hereinafter referred to as "Commission") should be established to ensure the enactment of this state requirement.

The Commission shall be appointed by the governor and consist of one optometrist, one ophthalmologist, one pediatrician or family practice physician, one representative of a nonprofit voluntary health organization dedicated to preventing blindness, one representative of the state department of education, one representative of the state department of public health, one school nurse, one public health nurse, one school superintendent, one local health commissioner, one parent representative, and other members as determined appropriate by the governor.

The Commission shall:

1. provide linguistically and culturally appropriate materials to be used in vision screening forms, notifications, and other communications among the school, parents/guardians, and licensed optometrists/physicians trained in the provision of comprehensive eye care;

2. pursue opportunities to offer free or low-cost eye examinations, using a sliding scale, to students who do not pass vision screenings and are unable to afford their own examination;
3. pursue opportunities to provide geographically accessible opportunities for such examinations;
4. designate an agency to collect data from school health personnel concerning results of the original screenings, reports from the comprehensive eye examination, outreach letters to unresponsive families, and referrals to child protective agencies, and submit this data to the Commission annually;
5. issue an annual report to the state secretary of the department of health, the secretary of the department of education, the governor, the state legislature, and the community with the key findings, including evaluation of cost effectiveness, as well as collected data and recommendations for possible modifications to the program; and
6. perform other related tasks, as assigned by the governor.

REFERENCES:

- ¹ Zoe's Story. Children's Vision Massachusetts Story Bank. Accessed May 7, 2020. <https://childrensvision.preventblindness.org/wp-content/uploads/sites/20/2020/05/Zoes-Storybank.pdf>
- ² Samantha's Story. Children's Vision Massachusetts Story Bank. Accessed May 7, 2020. https://childrensvision.preventblindness.org/wp-content/uploads/sites/20/2020/05/CVMA-Samanthas-Story_1.pdf
- ³ Ying G, Maguire MG, Cyert LA, et al. Prevalence of vision disorders by racial and ethnic group among children participating in Head Start. *Ophthalmology*. 2014;121(3):630–636. doi:10.1016/j.ophtha.2013.09.036
- ⁴ Wen G, McKean-Cowdin R, Varma R, et al. General health-related quality of life in preschool children with strabismus or amblyopia. *Ophthalmology*. 2011;118(3):574-580. doi:10.1016/j.ophtha.2010.06.039
- ⁵ Roche-Leveq A, Brody BL, Thomas RG, Brown SI. Ametropia, preschoolers' cognitive abilities, and effects of spectacle correction. *Archives of Ophthalmology*. 2008;126(2):252-258. doi:10.1001/archophthalmol.2007.36
- ⁶ Atkinson J, Anker S, Nardini M, et al. Infant vision screening predicts failures on motor and cognitive tests up to school age. *Strabismus*. 2002;10(3):187-198. doi:10.1076/stra.10.3.187.8125
- ⁷ Ibranke JO, Friedman DS, Repka MX, et al. Child development and refractive errors in preschool children. *Optometry and Vision Science*. 2011;88(2):181-187. doi:10.1097/OPX.0b013e318204509b
- ⁸ Jonas DE, Amick HR, Wallace IF, et al. Vision in Children Ages 6 Months to 5 Years: A Systematic Review for the U.S. Preventive Services Task Force (Evidence Synthesis, No. 153). Agency for Healthcare Research and Quality. September 2017. Accessed May 8, 2020. <https://www.ncbi.nlm.nih.gov/books/NBK487841>
- ⁹ Basch CE. Vision and the achievement gap among urban minority youth. *Journal of School Health*. 2011;81(10):599-605. doi:10.1111/j.1746-1561.2011.00633.x
- ¹⁰ Davidson S, Quinn GE. The impact of pediatric vision disorders in adulthood. *Pediatrics*. 2011;127(2):334-339. doi:10.1542/peds.2010-1911
- ¹¹ World Health Organization (WHO). World Report on Vision. WHO publication ISBN 978-92-4-151657-0. 2019. Accessed May 7, 2020. <https://apps.who.int/iris/bitstream/handle/10665/328717/9789241516570-eng.pdf>
- ¹² Kong L, Fry M, Al-Samarraie M, Gilbert C, Steinkuller PB. An update on progress and the changing epidemiology of causes of childhood blindness worldwide. *Journal of AAPOS*. 2012;16:501-507. doi:10.1016/j.jaapos.2012.09.004
- ¹³ Varma R, Tarczy-Hornoch K, Jiang X. Visual impairment in preschool children in the United States: demographic and geographic variations from 2015 to 2060. *JAMA Ophthalmology*. 2017;135(6):610-616. doi:10.1001/jamaophthalmol.2017.1021
- ¹⁴ Wittenborn JS, Zhang X, Feagan CW, et al. The economic burden of vision loss and eye disorders among the United States population younger than 40 years. *Ophthalmology*. 2013;120(9):1728-1735. doi:10.1016/j.ophtha.2013.01.068
- ¹⁵ United Nations. Transforming our World: the 2030 Agenda for Sustainable Development. 2015. Accessed May 7, 2020. <https://sustainabledevelopment.un.org/post2015/transformingourworld>
- ¹⁶ World Bank Group, Inter-American Development Bank, UNICEF (for G20 Development Working Group). G20 Development Working Group: Investing in Early Childhood Development. March 2018. Accessed May 7, 2020. <https://www.ecdan.org/assets/background-study—early-childhood-development.pdf>
- ¹⁷ Tarczy-Hornoch K, Varma R, Cotter SA, et al. Risk factors for decreased visual acuity in preschool children: the Multi-Ethnic Pediatric Eye Disease and Baltimore Pediatric Eye Disease Studies. *Ophthalmology*. 2011;118(11):2262-2273. doi:10.1016/j.ophtha.2011.06.033
- ¹⁸ Child and Adolescent Health Measurement Initiative (CAHMI). 2016-2017 National Survey of Children's Health (2 years Combined Data Set). January 2019. Accessed May 7, 2020. https://www.childhealthdata.org/docs/default-source/nsch-docs/spss-codebook_-2016-2017nsch_drcv1_01-11-19.pdf

- ¹⁹ Ganz M, Xuan Z, Hunter DG. Patterns of eye care use and expenditures among children with diagnosed eye conditions. *Journal of the American Association of Pediatric Ophthalmology and Strabismus*. 2007;11(5):480-487. doi:10.1016/j.jaapos.2007.02.008
- ²⁰ Qiu M, Wang SY, Singh K, Lin SC. Racial disparities in uncorrected and undercorrected refractive error in the United States. *Investigative Ophthalmology & Visual Science*. 2014;55(10):6996-7005. doi:10.1167/iovs.13-12662
- ²¹ National Academies of Sciences, Engineering, and Medicine. Making Eye Health a Population Health Imperative: Vision for Tomorrow. National Academies Press (US). September 15, 2016. Accessed May 7, 2020. <https://www.ncbi.nlm.nih.gov/books/NBK385157/>
- ²² Zinn AA, Tsui I, Rossetto JD, et al. Visual function in infants with antenatal Zika virus exposure. *Journal of the American Association of Pediatric Ophthalmology and Strabismus*. 2018;22(6):452-456.e1. doi:10.1016/j.jaapos.2018.07.352
- ²³ Chua B, Mitchell P. Consequences of amblyopia on education, occupation, and long term vision loss. *British Journal of Ophthalmology*. 2004;88(9):1119-1121. doi:10.1136/bjo.2004.041863
- ²⁴ Karoven E, Ilkka-Petri V, Liinamaa J. Amblyopia screening in Finland. *Journal of AAPOS*. 2018;22(4):E68. doi.org/10.1016/j.jaapos.2018.07.250
- ²⁵ Jin HD, Demmler-Harrison GJ, Coats DK, et al. Long-term visual and ocular sequelae in patients with congenital Cytomegalovirus infection. *Pediatric Infectious Disease Journal*. 2017;36(9):877-882. doi:10.1097/INF.0000000000001599
- ²⁶ Manconachie GDE, Gottlob I, McLean RJ. Risk factors and genetics in common comitant strabismus: a systematic review of the literature. *JAMA Ophthalmology*. 2013;131(9):1180-1186. doi:10.1001/jamaophthalmol.2013.4001
- ²⁷ Tarczy-Hornoch K, Cotter SA, Borchert M, et al. Prevalence and causes of visual impairment in Asian and Non-Hispanic White preschool children: Multi-ethnic Pediatric Eye Disease Study. *Ophthalmology*. 2013;120(6):1220-1226. doi:10.1016/j.ophtha.2012.12.029
- ²⁸ DeCarlo DK, Swanson M, McGwinn G, Visscher K, Owsley C. ADHD and vision problems in the National Survey of Children's Health. *Optometry and Vision Science*. 2016;(93)5:459-465. doi:10.1097/OPX.0000000000000823
- ²⁹ National Center for Children's Vision and Eye Health (NCCVEH), Prevent Blindness. 2011. Unpublished data from 2011 survey of state Title V Maternal and Child Health programs.
- ³⁰ Head Start, Early Childhood Learning & Knowledge Center. Head Start Program Facts: Fiscal Year 2017. 2017. Accessed May 7, 2020. <https://eclkc.ohs.acf.hhs.gov/about-us/article/head-start-program-facts-fiscal-year-2017>
- ³¹ U. S. Department of Health and Human Services, Administration for Children and Families. Vision Screening Resources (ACF-IM-HS-08-20). Information Memorandum. November 18, 2008. Accessed May 7, 2020. <https://eclkc.ohs.acf.hhs.gov/sites/default/files/docs/policy-im/2016-08%5D/ACF-IM-HS-08-20.pdf>
- ³² Borchert MS, Varma R, Cotter SA, et al. Risk factors for hyperopia and myopia in preschool children: the Multi-Ethnic Pediatric Eye Disease and Baltimore Pediatric Eye Studies. *Ophthalmology*. 2011;118(10):1966-1973. doi:10.1016/j.ophtha.2011.06.030
- ³³ McKean-Cowdin R, Varma R, Cotter SA, et al. Risk factors for astigmatism in preschool children: the Multi-ethnic Pediatric Eye Disease and Baltimore Pediatric Eye Studies. *Ophthalmology*. 2011;118:1974-1981. doi:10.1016/j.ophtha.2011.06.031
- ³⁴ The Wilmer Eye Institute, Johns Hopkins School of Medicine. *Vision and Eye Health Requirements by State*. 2019 Unpublished data.
- ³⁵ Ruderman, Marjorie. *Children's Vision and Eye Health: A Snapshot of National Issues* (1st ed.). NCCVEH. 2016.
- ³⁶ Marsh-Tootle WL, Russ SA, Repka MX, National Expert Panel to the NCCVEH. Vision and eye health in children 36 to <72 months: proposed data definitions. *Optometry and Vision Science*. 2015;92(1):17-23. doi: 10.1097/OPX.0000000000000444
- ³⁷ Hartmann EE, Block SS, Wallace DK, National Expert Panel to the NCCVEH. Vision and eye health in children 36 to <72 Months: proposed data system. *Optometry and Vision Science*. 2015;92(1):24-30. doi:10.1097/OPX.0000000000000445
- ³⁸ Vision Objectives, Healthy People 2020. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Accessed May 7, 2020. <https://www.healthypeople.gov/2020/topics-objectives/topic/vision/objectives>

- ³⁹ Bright Futures / American Academy of Pediatrics. Recommendations for Preventive Pediatric Health Care (Periodicity Schedule). Accessed May 7, 2020. https://www.aap.org/en-us/Documents/periodicity_schedule.pdf
- ⁴⁰ Centers for Medicare & Medicaid Services. EPSDT - A Guide for States: Coverage in the Medicaid Benefit for Children and Adolescents. June 2014. Accessed May 8, 2020. https://www.ihc-pa.org/PDFS/CMS_EPSDT_Coverage_Guide_with_SAMHSA-CMS_050714_BHRS_Bulletin_June_2014.pdf
- ⁴¹ Office of Inspector General, Department of Health and Human Services. Most Medicaid Children In Nine States Are Not Receiving All Required Preventive Screening Services (OEI-05-08-00520). May 2010. Accessed May 7, 2020. <https://oig.hhs.gov/oei/reports/oei-05-08-00520.pdf>
- ⁴² Office of Inspector General, Centers for Medicare & Medicaid Services. Needs To Do More To Improve Medicaid Children's Utilization of Preventive Screening Services (OEI-05-13-00690). Recommendation Followup Memorandum Report. November 2014. Accessed May 7, 2020. <https://oig.hhs.gov/oei/reports/oei-05-13-00690.pdf>
- ⁴³ Zhang X, Elliott MN, Saaddine JB, et al. Unmet eye care needs among U.S. 5th grade students. *American Journal of Preventive Medicine*, 2012;43(1):55-58. doi:10.1016/j.amepre.2012.01.032
- ⁴⁴ Cotter SA, Cyert LA, Miller JM, Quinn GE, National Expert Panel to the NCCVEH. Vision screening for children 36 to <72 months: recommended practices. *Optometry and Vision Science*. 2015;92(1):6-16. doi:10.1097/OPX.0000000000000429
- ⁴⁵ Turner AW, Xie J, Arnold A-L, Dunn RA, Taylor HR. Eye health service access and utilization in the National Indigenous Eye Health Survey. *Clinical & Experimental Ophthalmology*. 2011;39(7):598-603. doi:10.1111/j.1442-9071.2011.02529.x
- ⁴⁶ Cooper-Patrick L, Gallo JJ, Gonzales JJ, et al. Race, gender, and partnership in the patient-physician relationship. *JAMA*. 1999;282(6):583-9. doi:10.1001/jama.282.6.583
- ⁴⁷ Murphy MK. Future Directions for Improving Access and Care Delivery. Presented at: National Academies of Sciences, Engineering, and Medicine's Dissemination Workshop on Making Eye Health a Population Imperative. March 13, 2017.
- ⁴⁸ Kemper AR, Crews JE, Strickland B, Saaddine JB. Vision screening among children aged <6 Years – Medical Expenditure Panel Survey, United States, 2009-2010. *MMWR*. 2014;63(02):43-46. Accessed May 7, 2020. <https://www.cdc.gov/mmwr/preview/mmwrhtml/su6302a7.htm>
- ⁴⁹ Wiatrowski WJ. Employment-based Health Benefits in Small and Large Private Establishments. Beyond the Numbers, U.S. Bureau of Labor Statistics, U.S. Department of Labor. April 2013. Accessed May 7, 2020. <http://www.bls.gov/opub/btn/volume-2/employment-based-health-benefits-in-small-and-large-private-establishments.htm>
- ⁵⁰ Chu R, Huang K, Barnhardt C, Chen A. The effect of an on-site vision examination on adherence to vision screening recommendations. *The Journal of School Nursing*. 2015;31(2):84-90. doi: 10.1177/1059840514524599
- ⁵¹ Traboulsi EL, Cimino H, Mash C, Wilson R, Crowe S, Lewis H. Vision First, a program to detect and treat eye diseases in young children: the first four years. *Transactions of the American Ophthalmological Society*. 2008;106:179-186.
- ⁵² Zinn AA, Tsui I, Rossetto J, et al. Screening criteria for ophthalmic manifestations of congenital Zika virus infection. *JAMA Pediatrics*. 2017;171(9):847-854. doi:10.1001/jamapediatrics.2017.1474
- ⁵³ Capretti MG, Marsico C, Guidi SG, et al. Neonatal and long-term ophthalmological findings in infants with symptomatic and asymptomatic congenital cytomegalovirus infection. *Journal of Clinical Virology*. 2017;97:59-63. doi:10.1016/j.jcv.2017.11.001
- ⁵⁴ Merrill K, Areaux RG. Strabismus patterns in patients with intrauterine drug exposure. *Journal of Binocular Vision and Ocular Motility*. 2020;70(1):11-14. doi:doi.org/10.1080/2576117X.2019.1686913
- ⁵⁵ Heslin KC, Casey R, Shaheen MA, Cardenas F, Baker RS. Racial and ethnic differences in unmet need for vision care among children with special health care needs. *Archives of Ophthalmology*, 2006;124(6):895-902. doi:10.1001/archophth.124.6.895

- ⁵⁶ Tanski S, Garfunkel LC, Duncan PM, Weitzman M, eds. Performing Preventive Services: A Bright Futures Handbook. American Academy of Pediatrics publication. 2010. Accessed May 8, 2020. <https://brightfutures.aap.org/materials-and-tools/PerfPrevServ/Pages/default.aspx>
- ⁵⁷ American Academy of Ophthalmology. Pediatric Eye Evaluations Preferred Practice Pattern[®]. Elsevier, Inc. 2017. Accessed May 7, 2020. [https://www.aaojournal.org/article/S0161-6420\(17\)32958-5/pdf](https://www.aaojournal.org/article/S0161-6420(17)32958-5/pdf)
- ⁵⁸ Perkins J, McKee C. Vision services for children on Medicaid: a review of EPSDT services. National Health Law Program Issue Brief. May 12, 2015. Accessed May 8, 2020. <https://healthlaw.org/resource/issue-brief-vision-services-for-children-on-medicaid-a-review-of-epsdt-services/#.WyqP12cah5I>
- ⁵⁹ Healthy People 2020. U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Accessed May 8, 2020. <https://www.healthypeople.gov/>
- ⁶⁰ Vision Objectives. U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, Healthy People 2020. Accessed May 8, 2020. <https://www.healthypeople.gov/2020/topics-objectives/topic/vision/objectives>
- ⁶¹ Individuals with Disabilities Education Act, 20 USC Chapter 33 (2017). Accessed May 8, 2020. <https://uscode.house.gov/view.xhtml;jsessionid=38B91C0FF393B5DDFB3EA9224470BBA3?req=granulaid%3AUSC-prelim-title20-chapter33&saved=L3ByZWxpUB0aXRszTIwL2NoYXB0ZXIzMy9zdWJjaGFdGVyMg%3D%3D%7CZ3JhbnVsZWlkOIVTQy1wcmVsaW0tdGI0bGUyMC1jaGFwdGVyMzMtc3ViY2hhcHRlcjl%3D%7C%7C%7C0%7Cfalse%7Cprelim&edition=prelim>
- ⁶² Institute of Medicine (US) Committee on Robert Wood Johnson Foundation Initiative on the Future of Nursing. The Future of Nursing: Leading Change, Advancing Health. National Academies Press (US). 2011. Accessed May 8, 2020. <https://pubmed.ncbi.nlm.nih.gov/24983041/>
- ⁶³ Vision and Eye Health. National Association of School Nurses (NASN). Accessed May 8, 2020. <https://www.nasn.org/nasn-resources/practice-topics/vision-heal>