CHILDREN'S VISION AND EYE HEALTH:
A Snapshot of Current National Issues

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About Prevent Blindness and the National Center for Children's Vision and Eye Health

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 taking care of their eyes and their vision, by promoting advances in public health systems that support eye health needs, and by advocating for public policy that emphasizes early detection and access to appropriate eye care.

Prevent Blindness is home to the National Center for Children's Vision and Eye Health (NCCVEH). The mission of the NCCVEH is to improve the systems that address children's vision and eye health. To accomplish this mission, the NCCVEH works towards a coordinated public health infrastructure to promote and ensure a comprehensive, multi-tiered continuum of vision care for young children. This coordinated approach to vision health for children leads to a uniform implementation of successful screening programs, increased follow-up to eye care, improved surveillance, and stakeholder engagement. The NCCVEH works in collaboration with national and state partners to provide technical assistance, education, training, resources, and leadership – advancing a universal approach to children's vision health in the United States. The NCCVEH is supported by a grant from HRSA – Maternal and Child Health Bureau (Grant # H7MMC24738 – Vision Screening for Young Children).

The efforts of the NCCVEH are focused on the following objectives:

1. Serve as a technical resource center to states in the development and improvement of comprehensive vision and eye health programs for children.
2. Enhance existing efforts in the surveillance of children's vision, screening, outcomes to eye care, and health disparities impacting access to eye care for children.
3. Develop and disseminate educational tools and information that promote a comprehensive approach to children's vision and eye health.

About this Report

The Children's Vision and Eye Health: A Snapshot of Current National Issues report is a compilation of current research, survey data, and best-practices that outline the current landscape for children's vision and eye health in the United States. It is our intent that the information and examples provided in this report translate into effective community-level health promotion strategies leading to improved vision. This report is designed to arm diverse stakeholders with 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, and others interested in improving the health of children.

When selecting among effective interventions to improve vision health outcomes, you should first assess your resources and immediate priorities. This report should be used along with technical assistance offered by the National Center for Children's Vision and Eye Health, local or state health experts, public health program managers, researchers, or others with relevant expertise in your community to ensure successful changes in your vision health system for children.

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The following staff members of Prevent Blindness and the National Center for Children's Vision and Eye Health also assisted in the development of this publication: Kira Baldonado and Arzu Bilazer .

This report was supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number H7MMC24738 – *Vision Screening for Young Children Grant* (total award amount $300,000; percentage financed with nongovernmental sources .5%). This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government.

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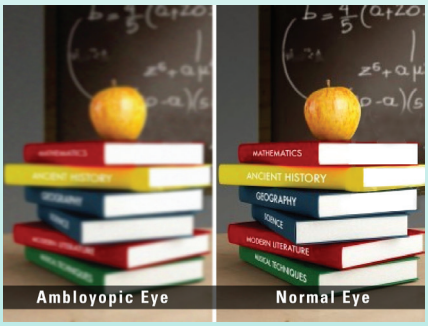
Vision plays an important role in children's physical, cognitive, and social development. More than one in five preschool-age children enrolled in Head Start have a vision disorder.[1] Uncorrected vision problems can impair child development, interfere with learning, and even lead to permanent vision loss; early detection and treatment are critical.[2,3,4,5,6] Visual functioning is a strong predictor of academic performance in school-age children,[7,8] and vision disorders of childhood may continue to affect health and well-being throughout the adult years.[9]

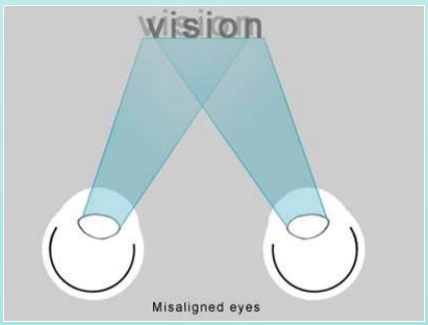
The economic costs of children's vision disorders are significant, amounting to $10 billion yearly in the United States.[10] This estimate takes into account the costs of medical care, vision aids and devices, caregivers, special education, vision screening programs, federal assistance programs, and quality of life losses. Families shoulder 45 percent of these costs—not including the value associated with diminished quality of life.[10]

This report brings together information about the scope of the problem, national and state-level policy changes, and efforts to build comprehensive systems to promote vision and eye health. Recent research provides new estimates of the prevalence of vision disorders among U.S. children and new knowledge about factors affecting risk and access to needed services. Nationally, the Affordable Care Act has expanded access to vision insurance coverage, while state-level initiatives have strengthened vision screening and eye health programs. Working with national experts in clinical and public health, an Expert Panel to the National Center for Children's Vision and Eye Health (NCCVEH) has released consensus guidelines for effective vision screening practices to ensure the early detection, diagnosis, and treatment of vision disorders for children 36 to 72 months of age.[11] The guidelines also address systems for accountability and public health surveillance of children's vision and eye health.[12, 13]

These steps are just the beginning. Much work remains to build awareness of the significance of vision disorders and to ensure that every state has a comprehensive system to promote vision and eye health. This report is intended as a tool to support those efforts.

Prevalence and Impact of Vision Disorders in U.S. Children





Vision loss

Nearly 3 percent of children younger than 18 years are blind or visually impaired, defined as having trouble seeing even when wearing glasses or contact lenses, according to the National Health Interview Survey.[14] Due to the survey's methodology, this estimate may include children with under-corrected, but correctable, vision disorders.

Amblyopia

Amblyopia (sometimes called "lazy eye"), found in about 2 percent of 6- to 72-month-old children, is the most common cause of vision loss in children.[15,16,17] 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 refractive error or unequal refractive error between eyes.[18] Typically, the vision loss affects only one eye, but people with amblyopia are nearly three times more likely than those without amblyopia to develop vision impairment in their better-seeing eye later in life.[19] Early detection of amblyopia is critical; treatment is most successful when initiated before the age of 7 years, and less effective at older ages.[20] Untreated, or treated too late, amblyopia can lead to permanent vision loss in one or both eyes.[6,21]

Strabismus

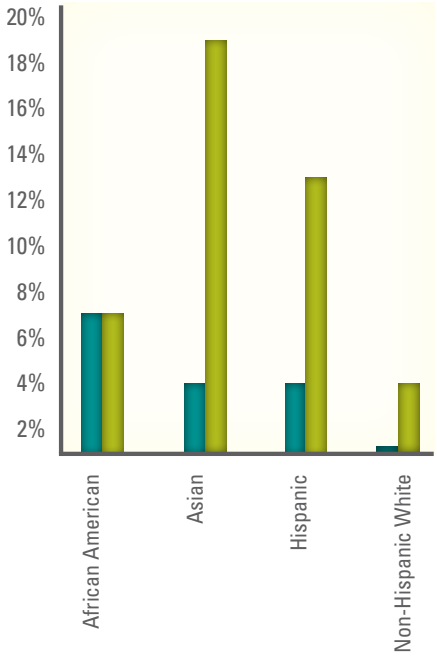
Between 2 and 4 percent of children under the age of 6 years have strabismus, a misalignment of the eyes that can lead to the development of amblyopia.[15,16,17] With the eyes oriented in different directions, the brain receives conflicting visual input, interfering with binocular vision development and depth perception. The effect on appearance of the eyes' misalignment also may negatively affect the emotional health, social relationships, and self-image of children with strabismus.[2]

Refractive Errors

The most common vision disorders in children are refractive errors—myopia, hyperopia, and astigmatism. Refractive errors occur when light is not focused on the retina, causing blurred vision. Uncorrected refractive errors in infants and preschool-age children are associated with parental concerns about developmental delay, as well as with clinically identified deficits in cognitive and visual-motor functions that may in turn affect school readiness.[3,4,5] Estimates of prevalence vary from study to study due to differences in diagnostic criteria and examination methods.

Myopia

Myopia is defined as a condition in which the visual images come to a focus in front of the retina of the eye resulting especially in defective vision of distant objects. Four percent of children 6 to 72 months of age[22] and 9 percent of older children (ages 5 to 17 years) have myopia, or nearsightedness.[23] The prevalence varies by age and race/ethnicity.[23,24,25]



Prevalence of myopia by race/ethnicity in U.S. children 6-72 months of age*
(myopia defined as SE≤-1.00 D)

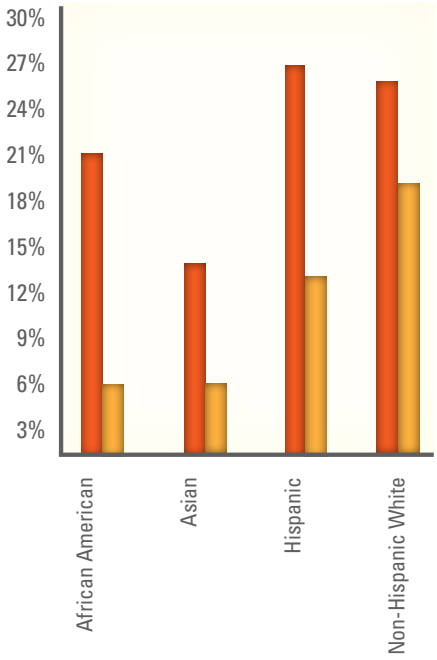
Prevalence of myopia by race/ethnicity in U.S. children ages 5-17 years*
(myopia defined as -.075 D or more in each principal meridian)

**Data for 6-to-72-month-old children are from the population-based Multi-Ethnic Pediatric Eye Disease Study. Data for 5-to-17-year-olds are from the Collaborative Longitudinal Evaluation of Ethnicity and Refractive Error Study, a multi-center but not population-based study.*

Sources: 23, 24, 25

Hyperopia

Hyperopia is defined as a condition in which the visual images come to a focus beyond the retina of the eye resulting especially in defective vision of near objects. The prevalence of hyperopia, or farsightedness (when nearby objects appear blurry), is 21 percent among children 6 to 72 months of age[22] and 13 percent among children ages 5 to 17 years.[23] As with myopia, the prevalence varies by age and race/ethnicity.[23,24,25]

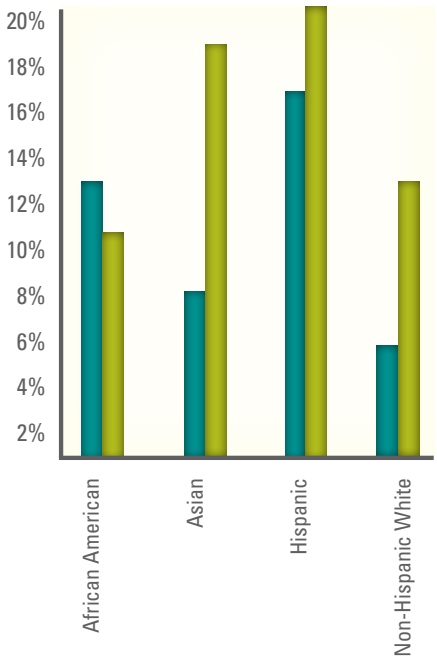


Prevalence of hyperopia by race/ethnicity in U.S. children 6-72 months of age*
(hyperopia defined as SE≥+2.00 D)

Prevalence of hyperopia by race/ethnicity in U.S. children ages 5-17 years*
(hyperopia defined as +1.25 D or more in each principal meridian)

** Data for 6-to-72-month-old children are from the population-based Multi-Ethnic Pediatric Eye Disease Study. Data for 5-to-17-year-olds are from the Collaborative Longitudinal Evaluation of Ethnicity and Refractive Error Study, a multi-center but not population-based study.*

Sources: 23, 24, 25



Astigmatism

Astigmatism is an irregularity in the shape of the cornea or lens that causes blurry vision at all distances if not corrected. Between 15 and 28 percent of children ages 5 to 17 years have astigmatism, depending on the diagnostic threshold used.[23] Children who have myopia or hyperopia are more likely to have astigmatism.[26]

Prevalence of astigmatism by race/ethnicity in U.S. children 6-72 months of age*
(astigmatism defined as 1.5 D or more)

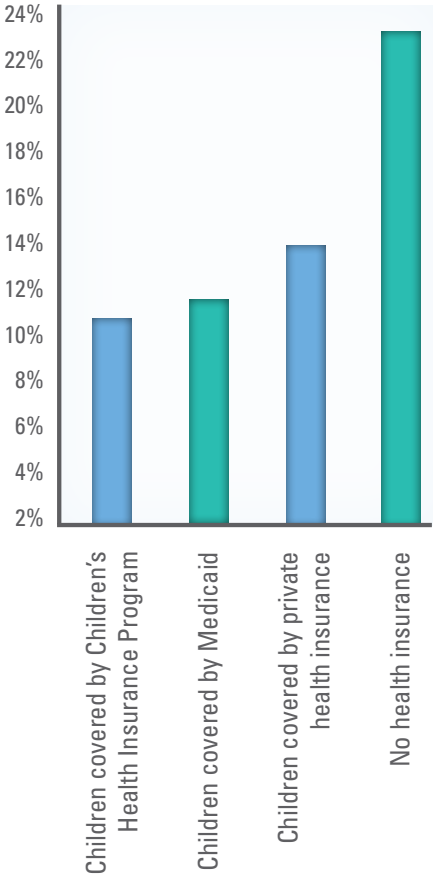
Prevalence of astigmatism by race/ethnicity in U.S. children ages 5-17 years*
(astigmatism defined as 1.25 or more)

** Data for 6-to-72-month-old children are from the population-based Multi-Ethnic Pediatric Eye Disease Study. Data for 5-to-17-year-olds are from the Collaborative Longitudinal Evaluation of Ethnicity and Refractive Error Study, a multi-center but not population-based study.*
Sources: 23, 24

Risk Factors

Both genetic and environmental factors play a role in the development of vision disorders. Family history is a risk factor for some vision disorders such as refractive error, as is premature birth.[27] The presence of some vision disorders increases the likelihood of developing other vision disorders, such as strabismus and amblyopia.[26,27] A number of neurodevelopmental disorders (e.g., cerebral palsy, Down syndrome, autism spectrum disorders, hearing impairment and speech delay) also are associated with higher rates of vision problems.[28] The most significant preventable risk factor for visual disorders in children is maternal smoking. Children of women who smoked cigarettes during pregnancy have higher rates of strabismus, hyperopia, and astigmatism.[22,26,27,29]

Parents unable to afford needed eyeglasses for their children, by child's health insurance status (2004-2006):
Source: 33



Access to Care

Too many children with vision disorders have unmet needs for care, leaving them vulnerable to negative effects on learning and development. Racial and socioeconomic inequities in access to care are evident across a variety of measures and studies. White children and children from families with higher incomes are more likely than other children to have diagnosed eye or vision disorders, suggesting greater access to diagnostic eye care.[30] Meanwhile, among children with diagnosed eye conditions, black children have lower overall health care expenditures than white children, but twice the expenditures for eye/vision-related emergency services, possibly indicating less access to a regular source of office-based health care.[30] The same pattern is evident when comparing children from families with incomes below 400 percent of the Federal Poverty Level to children from families with higher incomes.[30]

Nearly one in four (24%) adolescents with correctable refractive error has inadequate correction.[31] The odds of having inadequately corrected refractive error are significantly higher for Mexican American and non-Hispanic black youth, regardless of family income level; more than a third of Mexican American and non-Hispanic black adolescents have inadequately corrected refractive error.[31]

Among children with special health care needs (CSHCN), an estimated 6 percent have unmet vision care needs, but again, rates differ significantly across racial/ethnic and socioeconomic groups.[32] Compared to non-Hispanic white CSHCN, non-Hispanic black, multiracial, and Hispanic CSHCN are two to three times more likely to have unmet vision care needs.[32] CSHCN with no health insurance are almost twice as likely than CSHCN with private health insurance to have unmet vision care needs, while those Medicaid or SCHIP are less likely than those with private insurance to have unmet needs.[32] For 13 percent of CSHCN, an adult in the family had stopped working in order to care for the child; those children are about 1.5 times as likely to have unmet vision care needs.[32]

In a study of 5th-graders who wore eyeglasses or had been told that they needed to wear eyeglasses, 14 percent had gone without needed new or replacement eyeglasses within the last year because their parents could not afford the cost.[33] Children from families with lower incomes and children who lacked health insurance were more likely to have gone without needed eyeglasses.[33] Even among children covered by health insurance (public or private), only 15 percent reported having vision benefits that covered eye exams and eyeglasses.[33]

Vision Screening:

- Identifies children who may be at high risk for eye disease or in need of a professional eye examination
- Helps detect the possible presence ofdisorders at an early stage when treatment is more likely to be effective
- Provides valuable information and education about eye health
- Results in a referral to an eye care professional or primary care provider when screening tests indicate a need for diagnosis and treatment

Eye Examination:

- Provides a comprehensive evaluation of vision functioning and the health of the eye
- Is conducted by an Ophthalmologist or Optometrist who can diagnose and prescribe treatment for vision disorders

Children at high risk of vision disorders should bypass screening and be referred directly to an eye care professional:[11]

- Children born before 32 weeks of gestation
- Children with neurodevelopmental disorders
- Children with systemic diseases associated with vision problems
- Children who have a first-degree relative with strabismus or amblyopia
- Children with noticeable abnormalities such as crossed eyes (strabismus) or droopy eyelids (ptosis)
- Children whose parents are concerned about their vision

Nationally, only one-quarter of employees of private sector businesses have access to vision benefits through their employers.[34]

The role of health insurance in families' ability to access vision services was significantly strengthened by the passage of the Affordable Care Act. Pediatric vision care is an Essential Health Benefit under the ACA. All new individual and small group health insurance plans, including plans sold through the Health Insurance Marketplace created under the ACA, provide coverage of vision services for children younger than 19 years. In most states, this coverage amounts to a yearly comprehensive eye exam and eyeglasses, though benefits vary by state. (See Appendix, Pediatric Vision Benefits Available Under the Affordable Care Act.) In addition, all Marketplace plans cover vision screening by the primary care provider with no copay or coinsurance.

Screening and Intervention

Because young children and their parents may not be aware of reduced visual functioning, routine vision screening and/or eye examinations are vitally important to detect problems bbefore the child's development is compromised. Any possible problem identified by vision screening must be followed up with a comprehensive eye examination. Together, vision screening and eye examinations are complementary and essential elements of a strong public health approach to vision and eye health.

Some form of vision screening for children is **mandated** in 40 states. Of those, 40 require vision screening for school-age children. Only 15 states require vision screening for preschoolers. Few states specify vision screening protocols,[35] and screening methods vary widely from state to state. Additionally, all Head Start and Early Head Start programs—which together serve over one million children younger than 5 years[36] —are required to have a record of a vision screening completed for all enrollees within 45 days of entry. However, there is no national protocol for conducting these screenings.[37]

National Goals and Practice Standards

Early detection and intervention for vision problems are incorporated into national goals and health care standards. The Healthy People 2020 Objective V-1 is to "increase the proportion of preschool children aged 5 years and under who receive vision screening." The U.S. Preventive Services Task Force recommends vision screening at least once between the ages of 3 and 5 years.[6] National pediatric preventive care guidelines include vision screening by pediatricians yearly at ages 3 through 6 years, and then at regular intervals through late adolescence.[38,39]

Cost Effectiveness

Due to the time-sensitive nature of amblyopia treatment, vision screening for preschool-age children is considered a cost effective investment.[40] An analysis of the costs and outcomes of three screening scenarios found all three to be cost effective given a "willingness to pay" by policymakers of $4,000 to $10,500 for each case of visual loss prevented (depending on the method of screening).[41] Analyses of cost that take into account the quality-of-life effects of treatment for amblyopia have found that the societal benefits of both vision screening and comprehensive eye exams outweigh the costs.[42]

Screening Rates

Currently, it is difficult to determine with certainty how many children receive vision screening in the United States, because estimates vary depending on the source of data and type of screenings studied.[12,13] The main sources of data on screening rates are surveys of parents (or other adult members of households) that typically do not define what constitutes a vision assessment or specify the type of test or provider.

Healthy People 2020 uses the 2008 National Health Interview Survey for baseline data on vision screening. In that survey, 40 percent of children age 5 years and younger had ever had their "vision tested by a doctor or other health professional."[14] This estimate is consistent with the 2011 National Survey of Children's Health, which found that 40 percent of children age 5 years and younger had ever had their vision tested, and 83 percent of children ages 6 to 11 years had their vision tested within the past two years.[43] Neither survey provides information on the type of test, including whether the children received vision screening or comprehensive eye examinations. However, they do provide national, population-based data that point to significant disparities in vision assessment rates by household income and education levels, insurance coverage, race/ethnicity, and primary household language.

"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."

(Marsh-Tootle WL, Russ SA, Repka MX, 2015)

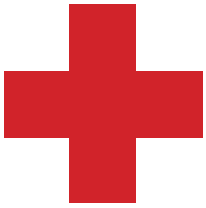
Receipt of vision screening in children age 17 years and younger
(2011 National Survey of Children's Health)

Percent screened by household income level

Under 200% of the Federal Poverty Level	62%
At or above 200% of the Federal Poverty Level	72%

Percent screened by highest education of adult in household

Less than high school education	52%
High school graduate	65%
More than high school education	71%



Percent screened by insurance coverage

Public insurance (such as Medicaid/SCHIP)	63%
Private health insurance	72%
Uninsured at time of survey	58%

Percent screened by consistency of insurance coverage

Consistently insured (currently insured and had no periods without insurance coverage in the previous 12 months)	69%
Not consistently insured (currently uninsured or had periods without insurance coverage in the previous 12 months)	60%

Percent screened by Special Health Care Needs Status

Children with special health care needs	80%
Children without special health care needs	64%

Percent screened by Hispanic ethnicity and primary household language

Hispanic children, Spanish is primary household language	48%
Hispanic children, English is primary household language	68%
Non-Hispanic children	71%

Percent screened by race/ethnicity

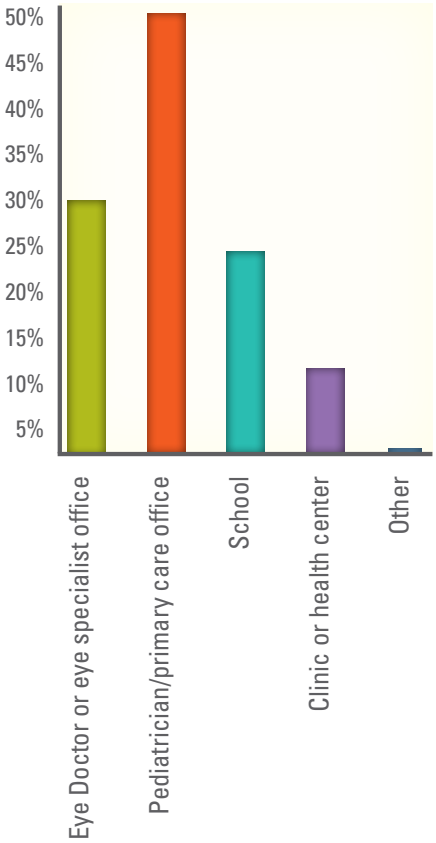
Hispanic	57%
White, non-Hispanic	72%
Black, non-Hispanic	71%
All other, non-Hispanic*	65%

* "All other, non-Hispanic" includes non-Hispanic children reporting more than one race category and non-Hispanic children reporting Asian, Native American, Native Alaskan, or Native Hawaiian (categories that were grouped due to small sample sizes in most states).

The survey asked whether children ever (for ages 0-5) or within the past 2 years (for ages 6-17) had their vision tested with pictures, shapes, or letters.

Source: *National Survey of Children's Health. NSCH 2011/12. Data query from the Child and Adolescent Health Measurement Initiative, Data Resource Center for Child and Adolescent Health website. Retrieved February 17, 2015 from www.childhealthdata.org*

Site of vision testing in children ages 3 to 6 years



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Survey of Children's Health (NSCH), 2011-2012

The medical home is an important site of vision screening. Medicaid's Early and Periodic Screening, Diagnosis, and Treatment program requires vision services to be provided "at intervals that meet reasonable standards as determined in consultation with medical experts" for all Medicaid enrollees younger than 21 years of age.[44] However, in nine states examined for a 2010 report by the Office of Inspector General of the Department of Health and Human Services, 60 percent of children on Medicaid received no vision screenings.[45] 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 at least in part to the lack of access to data from school-based screenings and the lack of standard billing codes for screening vision in children younger than 3 years of age.[46]

Follow-Up Rates and Systems

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 receiving diagnostic exams and treatment after failed screenings. No standardized system is in place to track screening and follow up across providers and sites in which screenings occur.[13] A system is sorely needed, both to provide population-level data and to ensure that individual children receive necessary services.

In a study of vision screening within medical home settings, fewer than half of preschool-age children who failed the screening were referred for diagnostic exams.[47] Children who receive referrals do not always obtain the necessary care—as many as two-thirds, in one study.[33] Cost, access to providers, and parental awareness of the significance of vision problems pose barriers to receiving eye exams and eyeglasses after failed screens.[48,49]

Our current knowledge about the outcomes of screening programs and follow-up care comes primarily from targeted studies of specific programs in limited geographic regions. Without a uniform method to track vision screening results and subsequent access to needed services, even within individual states, we lack vital information for assessing the effectiveness of these efforts and facilitating coordinated, comprehensive care across service systems.

Some states are addressing the lack of population-based data systems by incorporating vision screening and follow-up care into their existing immunization tracking systems (e.g., Michigan, Minnesota, Ohio, Rhode Island).[13] Building on state-level integrated health information systems leverages existing infrastructure (including measures to ensure confidentiality and security) and mechanisms for communication across service sites and providers.

State Approaches to Ensuring Children's Vision and Eye Health

State System Change Snapshot: Ohio

Improving State-Level Surveillance by Integrating Health Data Collection

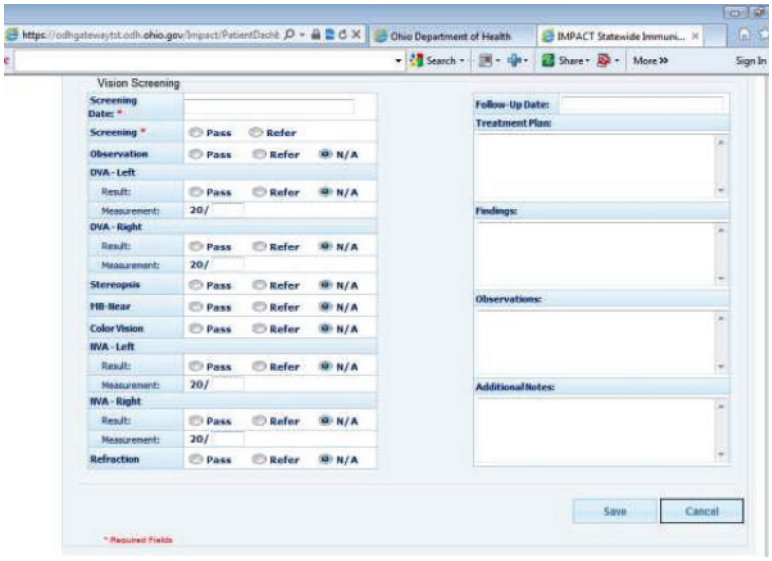
Ohio established surveillance of vision health at both the individual and population levels by integrating data on vision screening, eye examination, and treatment outcomes into its state immunization information system (ImpactSIIS, https://odhgateway.odh.ohio.gov/impact/). The Ohio Department of Health (ODH) developed a security protocol for all individuals authorized to access the vision health module, as well as training programs, staffing support, and internal data entry/analysis systems. All screening sites (including primary care, early education/Head Start, community screening programs, public health clinics) submit vision screening and referral data to the system via direct data entry or by uploading a separate data reporting file. Eye care providers in the state also have access to the data entry system, allowing them to submit examination outcomes and treatment recommendations.

This multi-stakeholder effort has yielded multiple achievements:

- Established a uniform set of data collection points
- Identified all sources of data on vision screening/referral and examination outcomes in the state
- Created a centralized mechanism for the secure collection of screening/referral data
- Developed a data analysis plan
- Developed an evaluation and monitoring plan
- Developed data system quality improvement methods

Efforts to further develop and improve the system are ongoing. Ohio's Title V Maternal and Child Health program incorporated vision screening into one of its ten State Performance Measures, annually tracking the "percent of children who receive timely, age-appropriate screening and referral." A broad set of stakeholders contributes to system improvement through engagement in needs assessments, workgroups, and other advisory mechanisms.

Figure: Screen shot from hearing and vision screening page in Ohio's ImpactSIIS



State System Change Snapshot: Massachusetts

Improving Annual Vision Screening Rates across a Pediatric Primary Care Network

Recognizing the importance of vision screening for preschool-age children, the Pediatric Physicians' Organization at Children's (PPOC, Boston Children's Hospital), one of the largest pediatric primary care physician organizations in the country, implemented a rigorous quality improvement process to improve screening rates in their network.

The PPOC, which cares for over 400,000 children at more than 90 primary care locations throughout Massachusetts, provided system-wide training and supported the development of practice-specific quality improvement cycles (Plan-Do-Study-Act) to improve vision screening processes and completion rates. Referrals for eye exams are now considered "critical referrals"; practices track them from initiation through closure communication with specialty care providers. Practices work closely with families to schedule comprehensive eye exams and ensure the exams have been completed.

Among the 34 practices that participated in the initial phase of this quality improvement effort, acuity screening increased from 25 to 31 percent for 3-year-olds, from 50 to 56 percent for 4-year-olds, and from 59 to 65 percent for 5-year-olds. Ocular alignment screening increased from 23 to 27 percent for 3-year-olds, from 42 to 44 percent for 4-year-olds, and from 44 to 50 percent for 5-year-olds. Efforts to further improve screening rates are ongoing, including additional training and consideration of new technologies for vision screening in young children.

State System Change Snapshot: Arizona

Increasing Provision of Preventive Health Services Through Changes in the Payment System

Arizona leveraged a proposed change in Medicaid payment policy, along with strong philanthropic support for screening in primary care settings, to create rapid improvement in the rates and quality of vision screening for young children. A large health foundation in the state convened key stakeholders to coordinate systems and resources to move the work forward.

Approximately 40 percent of Arizona children are enrolled in health insurance through Arizona Health Care Cost Containment System (AHCCCS), the state's Medicaid agency. The change in AHCCCS policy allows payment for instrument-based pediatric vision screening (ocular photoscreening) for children ages 3 to 5 years. Payment is limited to one occurrence in a lifetime, and the screening must occur in conjunction with a well-child medical visit. This new payment provides an incentive for primary care practices to purchase and use vision screening devices, the costs of which previously have been a barrier to acquisition. Additionally, the billing CPT code (99174 or 99177)can be used as a process measure indicating rate of screening in this population, ultimately driving further practice improvements for children's vision and eye health.

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 the 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?
- Are there populations that are being missed, are unable to access eye care, or need special considerations?
- What percentage of children ages 3 through 5 years receive 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 any statewide tracking of vision screening and follow-up? If so, does it integrate systems, sites, and providers to support population-based (all children) data?

Creating Effective Systems

Vision screening, eye examinations, population-based data systems, and measures of accountability are the cornerstones of a comprehensive system to ensure children's vision and eye health. A National Expert Panel convened by the NCCVEH has issued guidelines for each of these critical components.[11,12,13,50]

Vision screenings—usually conducted in a school, primary care practice, or community health center—identify general vision problems at an early stage.

- Screening should occur annually (best practice) or at least once (acceptable minimum standard) between the ages of 3 and 6 years, and periodically throughout the school years for children who do not receive comprehensive eye exams.
- 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, with subsequent referral to an ophthalmologist or optometrist for examination and treatment when indicated.

Eye examinations performed by optometrists or ophthalmologists are necessary to diagnose and treat eye disorders.

- Children who have failed a vision screening should be referred for a comprehensive eye exam.
- Children at high risk of vision disorders (see sidebar on page 7) should be referred directly to an eye care specialist without undergoing screening.
- Exam outcomes should be shared among key stakeholders with patient permission.

Population-based data systems provide the capacity to document receipt of services, measure the performance of screening and follow-up programs, track progress toward public health goals, and improve outcomes for children.

- Data systems should incorporate unique child identifiers to reduce duplication of services.
- Data systems must be able to accept data from all sites of screening and sources of care.
- Ideally, data systems for monitoring vision screening and eye care would be incorporated into state-level integrated health information systems.

Performance measures guide the use of aggregate population data for program accountability and system improvement.

- Specific, measurable goals must be established to monitor overall system performance at state and national levels and provide a basis for quality improvement activities.
- Performance measures should define the numerator, denominator, and age range of children included, and ideally would be reported by birth cohort.

The National Expert Panel's detailed recommendations for vision screening methods, integrated data systems to track screening and follow-up exams, and performance measures to monitor progress are available at http://visionsystems.preventblindness.org.

Proposed Performance Measures for Vision Care of Preschool-Age Children[12]

1) *Proportion of children receiving vision screening or eye examination*

   Numerator: Number of children from the denominator who completed a valid vision screening in a medical or community setting, or received an eye examination by an optometrist or ophthalmologist at least once between the ages of 36 to <72 months

   Denominator: All children who turn 72 months of age by December 31st of the reporting year in the entire population, or a representative sample

2) *Proportion of children with a neurodevelopmental disorder receiving timely eye examination*

   Numerator: Number of children from the denominator who completed an eye examination by an ophthalmologist or optometrist within 6 months of diagnosis of the neurodevelopmental disorder

   Denominator: All children who turn 72 months of age by December 31st of the reporting year in the state, or a representative sample, diagnosed with a neurodevelopmental disorder

3) *Proportion of children receiving follow-up eye examinations after vision screening referral*

   Numerator: Number of children from the denominator who completed an eye examination by an optometrist or ophthalmologist within 6 months of a referral from quantitative vision screening

   Denominator: All children who turn 72 months of age by December 31st of the reporting year in the state, a region, or a representative sample, who were referred after quantitative screening in a medical or community setting between the ages of 36 to <72 months

4) *Proportion of children with visually-significant eye conditions who receive treatment or additional visits to an ophthalmologist or optometrist*

   Numerator: Number of children from the denominator who obtained glasses and/or attended at least one follow-up appointment with an optometrist or ophthalmologist within 6 months of an eye examination

   Denominator: All children who turn 72 months of age by December 31st of the reporting year in the population, or a representative sample, who were prescribed treatment including glasses and/or instructed by an optometrist or ophthalmologist to return within six months (e.g. for treatment of amblyopia, strabismus, or amblyogenic refractive error)

Call to Action

State advocates and program and policy decision makers have multiple "entry points" to the system of services affecting children's vision and eye health. Actions that strengthen screening protocols, improve access to diagnostic exams and treatment, and bolster capacity for surveillance and performance measurement all contribute to the development and support of a comprehensive approach. These actions could include:

- Examining existing data to identify geographic, socioeconomic, and racial disparities in access to services and outcomes.
- Identifying gaps in data capacity.
- Clarifying existing state mandates, protocols, and guidelines for vision screening, and gauging the uniformity of their application across jurisdictions and the degree to which they align with current standards of practice.
- Convening stakeholders for priority setting and planning.

To be successful, these efforts require the knowledge, insights, and contributions of many stakeholders:

- Families
- Public health leaders
- Ophthalmologists and Optometrists
- Primary care providers (including pediatricians, community health centers, and other "medical homes")
- Early childhood educators
- Early care and education agencies
- Community organizations
- Insurance providers, Medicaid/CHIP, and other funders
- Epidemiologists and health information system specialists
- Legislators

Each of these stakeholders has a unique role to play in building and sustaining a comprehensive, effective system. Working together, they—and you—can forge a stronger vision and eye care system, ultimately improving the health and well-being of all children in your state.

SOURCES

[1] 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.

[2] 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.

[3] Roche-Levecq A, Brody BL, Thomas RG, Brown SI. Ametropia, Preschoolers' Cognitive Abilities, and Effects of Spectacle Correction. *Archives of Ophthalmology*, 2008;126(2):252-258.

[4] 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.

[5] Ibironke JO, Friedman DS, Repka MX, et al. Child Development and Refractive Errors in Preschool Children. *Optometry and Vision Science*, 2011;88(2):181-187.

[6] US Preventive Services Task Force. Vision Screening For Children 1 To 5 Years Of Age: US Preventive Services Task Force Recommendation Statement. *Pediatrics*, 2011;127(2):340-346.

[7] Maples WC. Visual Factors That Significantly Impact Academic Performance. *Optometry*, 2003;74(1):35-49.

[8] Basch CE. Vision and the Achievement Gap among Urban Minority Youth. *Journal of School Health*, 2011;81(10);599-605.

[9] Davidon S, Quinn GE. The Impact of Pediatric Vision Disorders in Adulthood. *Pediatrics*, 2011;127(2):334-339.

[10] 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.

[11] Cotter SA, Cyert LA, Miller JM, Quinn GE. Vision Screening for Children 36 to <72 Months: Recommended Practices. *Optometry and Vision Science*, 2015;92(1):6-16.

[12] Marsh-Tootle WL, Russ SA, Repka MX. Vision and Eye Health in Children 36 to <72 Months: Proposed Data Definitions. *Optometry and Vision Science*, 2015;92(1):17-23.

[13] Hartmann EE, Block SS, Wallace DK. Vision and Eye Health in Children 36 to <72 Months: Proposed Data System. *Optometry and Vision Science*, 2015;92(1):24-30.

[14] National Health Interview Survey, CDC/NCHS. Data retrieved from Healthy People 2020 website, https://www.healthypeople.gov/2020/topics-objectives/topic/vision/objectives#5373. Accessed February 4, 2015.

[15] Multi-Ethnic Pediatric Eye Disease Study Group. Prevalence of Amblyopia and Strabismus in African American and Hispanic Children Ages 6 to 72 Months: The Multi-Ethnic Pediatric Eye Disease Study. *Ophthalmology*, 2008;115(7):1229-1236.

[16] McKean-Cowdin R, Cotter SA, Tarczy-Hornoch K, et al. Prevalence of Amblyopia or Strabismus in Asian and Non-Hispanic White Preschool Children: Multi-Ethnic Pediatric Eye Disease Study. *Ophthalmology*, 2013;120(10):2117-2124.

[17] Friedman DS, Repka MX, Katz J, et al. Prevalence of Amblyopia and Strabismus in White and African American Children Aged 6 Through 71 Months: The Baltimore Pediatric Eye Disease Study. *Ophthalmology*, 2009;116(11):2128-2134.

[18] American Association for Pediatric Ophthalmology and Strabismus. http://www.aapos.org/terms/conditions/21. Accessed February 5, 2015.

[19] Chua B, Mitchel P. Consequences of Amblyopia on Education, Occupation, and Long Term Vision Loss. *British Journal of Ophthalmology*, 2004;88(9):1119-1121.

[20] Holmes JM, Lazar EL, Melia BM, et al. Effect Of Age On Response To Amblyopia Treatment In Children. *Archives of Ophthalmology*, 2011;129(11):1451-1457.

[21] Rein DB, Wittenborn JS, Zhang X, et al. The Potential Cost-Effectiveness Of Amblyopia Screening Programs. *Journal of Pediatric Ophthalmology & Strabismus*, 2012;49(3):146-155.

[22] Borchert MS, Varma R, Cotter SA, et al. Risk Factors For Hyperopia And Myopia In Preschool Children. *Ophthalmology*, 2011;118(10):1966-1973.

[23] Kleinstein RN, Jones LA, Hullett S, et al. Refractive Error And Ethnicity In Children. *Archives of Ophthalmology*, 2003;121(8):1141-1147.

[24] Wen G, Tarczy-Hornoch K, McKean-Cowdin R, et al. Prevalence Of Myopia, Hyperopia And Astigmatism In Non-Hispanic White And Asian Children: Multi-Ethnic Pediatric Eye Disease Study. *Ophthalmology*, 2013;120(10):2109-2116.

[25] Multi-Ethnic Pediatric Eye Disease Study Group. Prevalence of Myopia and Hyperopia in 6 to 72 Months Old African American and Hispanic Children: The Multi-Ethnic Pediatric Eye Disease Study. *Ophthalmology*, 2010;117(1):140-147.

[26] McKean-Cowdin R, Varma R, Cotter SA, et al. Risk Factors For Astigmatism In Preschool Children. *Ophthalmology*, 2011;118(10):1974-1981.

[27] Cotter SA, Varma R, Tarczy-Hornoch K, et al. Risk Factors Associated With Childhood Strabismus. *Ophthalmology*, 2011;118(11):2251-2261.

[28] Salt A, Sargent J. Common Visual Problems in Children with Disability. *Archives of Disease in Childhood*, 2014;99(12):1163-1168.

[29] Fernandes M, Yang X, Li JY, Cheikh-Ismail L. Smoking During Pregnancy And Vision Difficulties In Children: A Systematic Review. *Acta Ophthalmologica*, 2014 Dec 28 (epub ahead of print).

[30] 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.

[31] 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.

[32] Heslin KC, Casey R, Shaheen MA, et al. 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.

[33] 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.

[34] Wiatrowski WJ. Employment-Based Health Benefits In Small And Large Private Establishments, Beyond the Numbers: Pay & Benefits, vol. 2, no. 8 (U.S. Bureau of Labor Statistics, April 2013), http://www.bls.gov/opub/btn/volume-2/employment-based-health-benefits-in-small-and-large-private-establishments.htm.

[35] Unpublished data from 2011 survey of state Title V Maternal and Child Health programs conducted by the National Center for Children's Vision and Eye Health, Prevent Blindness.

[36] Early Childhood Learning & Knowledge Center, Office of Head Start, Administration for Children and Families, U.S. DHHS . Head Start Program Facts, Fiscal Year 2014. http://eclkc.ohs.acf.hhs.gov/hslc/data/factsheets/2014-hs-program-factsheet.html. Accessed February 27, 2015.

[37] Office of Head Start, Administration for Children and Families, U.S. DHHS. Vision Screening Resources (ACF-IM-HS-08-20). Information Memorandum Issued November 18, 2008.

[38] Committee on Practice and Ambulatory Medicine of American Academy of Pediatrics, Section on Ophthalmology of American Academy of Pediatrics, American Association of Certified Orthoptists, American Association for Pediatric Ophthalmology and Strabismus, American Academy of Ophthalmology. Eye Examination in Infants, Children and Young Adults by Pediatricians. *Pediatrics*, 2003;111(4):902–907.

[39] Hagan JF, Shaw JS, Duncan PM, eds. Bright Futures Guidelines for Health Supervision of Infants, Children and Adolescents. 3rd ed. Elk Grove Village, IL: *American Academy of Pediatrics*; 2008.

[40] 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(2):43-46.

[41]Rein DB, Wittenborn JS, Zhang X, et al. The Potential Cost-Effectiveness Of Amblyopia Screening Programs. *Journal of Pediatric Ophthalmology & Strabismus*, 2012;49(3):146-155.

[42] Nader N. Costs, Benefits of Child Vision Screening Depend on Predictive Criteria of Screening Tools. Ocular Surgery News U.S. Edition. March 1, 2005. http://www.healio.com/ophthalmology/pediatrics-strabismus/news/print/ocular-surgery-news/%7B59748996-8c93-4a2b-af48-5072ca102530%7D/costs-benefits-of-child-vision-screening-depend-on-predictive-criteria-of-screening-tools. Accessed Feb. 7, 2015.

[43] National Survey of Children's Health. NSCH 2011/12. Data query from the Child and Adolescent Health Measurement Initiative, Data Resource Center for Child and Adolescent Health website. Retrieved February 17, 2015 from www.childhealthdata.org.

[44] Centers for Medicare & Medicaid Services. EPSDT—A Guide for States. June 2014. http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Benefits/Downloads/EPSDT_Coverage_Guide.pdf. Accessed February 5, 2015.

[45] Office of Inspector General, DHHS. Most Medicaid Children In Nine States Are Not Receiving All Required Preventive Screening Services (OEI-05-08-00520), May 2010.

[46] Office of Inspector General. CMS Needs To Do More To Improve Medicaid Children's Utilization Of Preventive Screening Services (OEI-05-13-00690), November 2014.

[47] Kemper AR, Helfrich A, Talbot J, Patel N, Crews JE. Improving the Rate of Preschool Vision Screening: An Interrupted Time-Series Analysis. *Pediatrics*, 2011;128(5):1279-1284.

[48] 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.

[49] Traboulsi EI, Cimino H, Mash C, et al. 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.

[50] National Center for Children's Vision and Eye Health. *See The Future: A Call to Action to Improve Children's Vision and Eye Health in the United States*. December 2014.

Vision Screening Rates by State

The 2011 National Survey of Children's Health asked whether children ever (for ages 0-5) or within the past 2 years (for ages 6-17) had their vision tested with pictures, shapes, or letters.

Percent Answering Yes (Did Receive Vision Screening), by Age and Race/Ethnicity

State	Age 0-5	Age 6-11	Age 12-17	Hispanic	White, non-Hispanic	Black, non-Hispanic	Other, non-Hispanic
Alabama	43	86	78	49	70	72	69
Alaska	38	82	81	67	67	75	64
Arizona	27	78	77	53	70	56	60
Arkansas	37	81	78	55	66	70	68
California	40	73	69	57	67	79	57
Colorado	38	84	86	63	71	85	76
Connecticut	41	90	85	56	81	65	69
Delaware	43	86	87	54	77	77	70
District of Columbia	41	80	78	35	63	71	70
Florida	38	82	80	57	74	68	64
Georgia	42	82	77	50	72	71	63
Hawaii	37	78	73	64	63	65	63
Idaho	30	70	75	47	59	67	69
Illinois	39	84	84	62	72	71	76
Indiana	35	85	83	61	69	73	67
Iowa	40	86	85	53	73	52	71
Kansas	41	88	84	58	75	71	59
Kentucky	44	87	83	53	72	79	70
Louisiana	44	81	83	50	69	76	55
Maine	41	83	81	66	69	53	76
Maryland	47	80	79	55	72	70	71
Mass	41	89	85	64	77	64	62
Michigan	42	85	85	60	74	70	69
Minnesota	50	82	82	58	74	69	67
Mississippi	43	83	77	49	66	73	65
Missouri	43	86	80	50	71	71	75
Montana	40	81	81	50	68	48	63
Nebraska	34	87	84	53	71	72	82
Nevada	31	72	71	50	65	68	62
New Hampshire	41	89	86	65	75	81	66
New Jersey	41	87	88	62	79	72	67
New Mexico	37	84	76	62	70	56	68
New York	40	85	84	59	75	76	65
North Carolina	42	88	77	56	73	66	74
North Dakota	35	84	81	70	68	58	62

State	Age 0-5	Age 6-11	Age 12-17	Hispanic	White, non-Hispanic	Black, non-Hispanic	Other, non-Hispanic
Ohio	42	84	84	69	71	70	72
Oklahoma	39	86	76	52	70	66	71
Oregon	36	82	71	49	66	90	72
Penn.	41	87	85	55	76	69	55
Rhode Island	45	91	84	59	79	75	70
South Carolina	40	83	77	51	71	65	65
South Dakota	39	84	87	61	71	64	67
Tennessee	42	87	80	61	72	72	66
Texas	38	81	80	58	75	71	65
Utah	35	85	76	62	65	82	68
Vermont	44	88	85	76	75	59	66
Virginia	43	83	80	54	72	71	66
Washington	36	83	73	55	67	57	69
West Virginia	44	86	86	74	72	77	73
Wisconsin	40	91	79	63	73	69	64
Wyoming	45	86	84	71	71	16	76

RATES OF VISION SCREENING

top high percentage

top low percentage

Source: National Survey of Children's Health. NSCH 2011/12. Data query from the Child and Adolescent Health Measurement Initiative, Data Resource Center for Child and Adolescent Health website. Retrieved February 17, 2015 from www.childhealthdata.org.

Vision Screening Requirements by State*

*The information in the chart below was compiled based on information available at the time of publication. State policies can change often- reference the most current published state legislative code and/or public health rules available.

	Screening or Exam Required?			
State	**Pre-School**	**School-Age**	**Frequency of Required Screening**	**Other Information**
Alabama	N	Y	Annually	
Alaska	Y	Y	Upon school entrance and at regular intervals determined by the school district	
Arizona	N	N		
Arkansas	Y*	Y	*Public pre-K K, grades 1, 2, 4, 6, 8 transfer students	Requires follow-up eye exam after a failed screen
California	N	Y	K, grades 2, 5, 8 transfer students	
Colorado	N	Y	K, grades 1. 2, 3, 5, 7, 9 Transfer students and special education students	
Connecticut	N	Y	K, grades 1–6 and 9	
Delaware	N	Y	K, grades 2, 4, 7, and 9 or 10 transfer students, students referred by teacher/ administrator, students considered for special education, driver education students prior to in-car hours	
District of Columbia	Y	Y	Upon enrollment into public and private pre-K K, grades 1, 3, 5, 7, 9, 11	
Florida	N	Y	K, grades 1, 3, 6 transfer students entering K–5 students considered for special education	
Georgia	N	Y	Upon entry into school system	
Hawaii	N	Y*	*Physical exam required prior to entry into school system includes basic vision status	
Idaho	N	N		No recommendation or requirement for vision screening
Illinois	Y	Y	Annual screening for preschool children 3 years of age or older in any public/ private preschool or licensed child care eye exam prior to public/private school entry screening in public/private K, grades 2 and 8 transfer students, special education students, students referred by teachers	Recommends screening in grades 4, 6, 10, 12

Screening or Exam Required?

State	Pre-School	School-Age	Frequency of Required Screening	Other Information
Indiana	N	Y	K or grade 1–performed by ophthalmologist or optometrist screening only in grades 3, 5, 8 screening of students suspected of having vision problem pertains to public and private schools	
Iowa	N	Y	Prior to enrollment in public/private K and grade 3	May be satisfied by online vision screening conducted by parent/guardian; proof of a screening may be met either electronically through the state immunization information system or in a hard copy provided by the parent
Kansas	N	Y	At least once every 2 years while enrolled in public school	
Kentucky	Y	Y	Eye exam for all children age 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 grades 6 and 9	
Louisiana	N	Y	Entry into K, grades 1, 3, 5, 7, 9	
Maine	N	Y	Screen in grades K, 1, 3, 5, 7, 9	
Maryland	N	Y	Entry into school, K, 1, and in 8th or 9th grade	
Massachusetts	N	Y	Required–vision screening grades K,1,2,3,4,5, once in middle school, once in high school and new student entry	Eye exam required for children with neurodevelopmental delay diagnosis; required for school entry for children who fail screening
Michigan	Y	Y	Once b/t ages 3 thru 5 and in grades 1, 3, 5, 7 and 9, or in conjunction with driver training classes.	
Minnesota	Y	Y	Children registered for the first time in a minnesota school; once between the ages of 3 thru 4 and children in in grades 1, 3, 5, 7, and 10	
Mississippi	Y	Y	Children in all public school districts in the state	

Screening or Exam Required?

State	Pre-School	School-Age	Frequency of Required Screening	Other Information
Missouri	N	Y	Eye exam required for children enrolling in kindergarten or 1st grade; screening completed before end of 1st and 3rd grades	
Montana	N	N		Recommended for all students
Nebraska	Y	Y	Eye exam required within six months prior to the entrance of a child in the beginner grade or upon transfer; periodic screening ages 3 through 5 annually; grades K thru 4, 7 and 10	
Nevada	N	Y	Screening required for children entering elementary school and one additional grade of elementary school, one grade of middle or junior high schools, one grade of high school, and transfer students	
New Hampshire	N	N		Recommends screening for pre-K, K and 1st grades; eye exam recommended for first year in school
New Jersey	N	Y	Screening required biennially for students in kindergarten through grade 10	
New Mexico	Y	Y	Screen required for students enrolled in pre-kindergarten, K, 1, 3, transfer and new students	
New York	Y	Y	Screening required in grades pre-kindergarten, K, 1–3, 5, 7, and 10; an eye exam is recommended	
North Carolina	N	Y	Legislation requires screening for students entering kindergarten or upon school entry;	Nc DHHS recommends K–5 + 1 middle school grade
North Dakota	N	N		No requirement and no state support services available
Ohio	N	Y	Grades K, 1, 3, 5, 7 and 9	Eye exam required for children on an IEP
Oklahoma	N	Y	Kindergarten, 1st and 3rd grade at public schools	
Oregon	Y	Y	Children in preschool (ages 3–5), kindergarten, and grades 1, 2, or 3; 4 or 5; 7 or 8; and 10 or 11, upon first entry into school,	Screening required for students enrolled in driver education, upon entrance into special education, and upon parent or teacher referral

Screening or Exam Required?

State	Pre-School	School-Age	Frequency of Required Screening	Other Information
Pennsylvania	Y	Y	Annually for students age 3 years and older	
Rhode Island	N	Y	Vision screening is required prior to entry into Kindergarten and for new students. Vision screenings are also required in grades 1, 2, 3, 4, 5, 7, and 9.	
South Carolina	N	N		Screening is not required but is recommended
South Dakota	N	N		No screening requirement or recommendation
Tennessee	Y	Y	All students in grades pre-K, K, 2, 4, 6, and 8	
Texas	Y	Y	All children upon their first enrollment to any school (public or private) or in a licensed child care setting; screening for children age 4 years old, kindergarten, grades 1, 3, 5, and 7	
Utah	N	N		Recommends screening students every other year after pre-kindergarten and kindergarten screenings, and annually for students with hearing impairment and any student referred by school personnel, parent or self; students who are currently receiving services from the Utah Schools for the Deaf and Blind (USDB) or LEA vision staff who have a diagnosed significant visual impairment will be exempt from screening 2015 Legislation requires Division of Services for the Blind and Visually impaired to certify volunteer vision screeners

Screening or Exam Required?

State	Pre-School	School-Age	Frequency of Required Screening	Other Information
Vermont	N	Y	Screening grades K, 1, 3, 5, 7, 9, and 12	
Virginia	N	Y	Grades K, 3, 7, and 10 (and upon entry into a school system)	
Washington	N	Y	Students in kindergarten, 1st, 3rd, 5th and 7th grades (or annually, if school resources permit) and for any child showing symptoms of possible loss in visual acuity referred to the district by parents, guardians, or school staff	
West Virginia	N	Y	Students entering public school for the first time and once between the ages of 11 and 13 years old.	
Wisconsin	N	N		Allows individual schools and boards to request evidence of an eye exam, but does not require
Wyoming	N	N		

For more information, see School Requirements for Children's Vision at http://nationalcenter.preventblindness.org/school-requirements-childrens-vision.

Pediatric Vision Benefits Available Under the Affordable Care Act

Pediatric vision care is an essential health benefit under the Affordable Care Act; all new individual and small group health insurance plans, whether or not they are part of the ACA's Health Insurance Marketplace (also called "exchanges"), must provide coverage of vision services for children younger than 19 years. Coverage for essential health benefits is defined by a "benchmark plan" in each state. If a state's 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) chose to use FEDVIP, which covers an annual eye exam and one pair of eyeglasses per year.

Alabama
Alaska
Arizona
Arkansas
California
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Louisiana
Maryland
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
North Carolina
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming

Only 3 states chose to use CHIP for supplemental pediatric vision coverage. Each covers annual eye exams and, with some limitations, corrective lenses.

Kansas
Kentucky
North Dakota

In 6 states, the benchmark plan already included pediatric vision care. Coverage varies by state.

Colorado
Maine
Massachusetts
New Mexico
New York
Utah (covers ages 5-18 years only)

Sources:

Center for Consumer Information and Insurance Oversight, Centers for Medicare & Medicaid Services. Summaries of EHB Benchmark Plans. Accessed on February 17, 2015. http://www.cms.gov/cciio/resources/data-resources/ehb.html

Essential Health Benefit Benchmark Plans, as of January 3, 2013. Retrieved from The Henry J. Kaiser Family Foundation website on February 17, 2015. http://kff.org/health-reform/state-indicator/ehb-benchmark-plans/

National Academy for State Health Policy and Georgetown University Health Policy Institute. Benefits and Cost Sharing in Separate CHIP Programs, May 2014.

What is Included in a Strong Vision Health System of Care?

1. Ensure that all parents/caregivers receive educational material, which respects cultural and literacy needs, about the importance of:
    a. good vision for their child now and in the future;
    b. scheduling *and attending* an eye exam when their child does not pass vision screening.
2. Ensure that parent/caregiver's written approval for vision screening includes permission to:
    a. share screening results with the child's eye doctor and primary care provider;
    b. receive eye exam results for your file;
    c. talk with the child's eye doctor for clarification of eye exam results and prescribed treatments;
    d. share eye exam results with the child's primary care provider.
3. Screen vision with age-appropriate and evidence-based tools and procedures, including optotypes (pictures) and/or instruments.
    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, utilize national referral and rescreening guidelines, and clearly state that a screening does not replace an eye exam nor provide a diagnosis.
4. Create policies for screening or direct referral for children with special needs.
5. Rescreen or refer difficult-to-screen (untestable) children.
    a. Research suggests that untestable children *are twice as likely* to have a vision problem than children who pass a vision screening.[51]
    b. If you have reason to believe that the child may perform better on another day, consider rescreening the child within 6 months*. Otherwise, refer untestable children for an eye exam.
6. Provide parents/caregivers with vision screening results in easy-to-understand language, which respects cultural and literacy needs and provides steps to take for 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 that the eye exam occurs.
    a. Identify and remove barriers to follow up to eye care, such as transportation or a lack of knowledge of what will occur during the eye exam.
    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 for an eye examination with an eye doctor who specializes in the care and treatment of young children.
9. Receive eye exam results for your files.
10. Send a copy of eye exam results to the child's primary care provider.
11. Ensure that the eye doctor'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. Evaluate the effectiveness of your vision health program annually.
    a. Compare screening results to eye exam outcomes.
    b. Identify variations in referral rates among your screeners.
    c. Monitor screening procedures to ensure they follow current recommendations.
    d. Monitor follow up to eye care for children who do not pass vision screening or who were untestable.
    e. Look for common barriers in follow up to eye care and development and implement solutions.

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* (American Academy of Ophthalmology Pediatric Ophthalmology/Strabismus Panel, 2012)

Prevent Blindness Model Children's Vision Legislation

Proposed Template for Legislative Text

Prevent Blindness suggests the following textual template be used for the development of state legislation to support healthy vision in children, modified as necessary to fit into the state's existing body of laws.

Section 1. School-readiness vision health requirements

Upon entering *[insert here the first year of required school within the state – kindergarten or first grade]* or within 30 days of the start of the school year, the parent or guardian of each child shall present to school health personnel certification that the child within the previous 12 months has passed a vision screening conducted by an authorized vision screener trained in vision screening techniques approved by the *[insert here an appropriate oversight body]*. Medical professionals conducting vision screenings for purposes of school entry must also follow the approved techniques. Such techniques must follow nationally recognized vision screening protocol, and at minimum include the following:

a) Observation (ABCs: Appearance signs, Behavior signs, Complaint signs)

b) Recognition distance visual acuity screening (utilizing either HOTV or Lea Symbols, or vision screening instruments demonstrating a scientific evidence base and deemed as best- or acceptable-practice by the Advisory Committee of the National Center for Children's Vision and Eye Health)

c) Appropriate follow-up and data collection procedures

Children who fit into one of the following categories must provide proof of a comprehensive eye examination performed by a licensed optometrist or physician 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:

- Children who fail to pass the vision screening
- Children with readily recognized eye abnormalities
- Children with systemic diseases or using medications known to cause eye disorders
- Children with a family history of a first-degree relative with strabismus or amblyopia
- Children born prematurely at less than 32 completed weeks of gestation
- Children with a diagnosed with neurodevelopmental delay

Documentation of a comprehensive eye exam within the previous twelve months shall waive the requirement of a vision screening.

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

a) Date of the report
b) Name, phone number, and address of the child
c) Name of the child's school
d) Type of examination
e) A summary of significant findings, including diagnoses, treatment, prognosis, whether or not a return visit is recommended and, if so, when
f) Recommended educational adjustments for the child, if any, which may include the following: preferential seating in the classroom, eyeglasses for full-time use in school, eyeglasses for part-time use in school or any other recommendations
g) Name, phone number, address and signature of the examiner

For all students who do not have documentation of a screening performed by an authorized screener or documentation of an eye examination performed within the previous twelve months, the school shall be responsible for providing an authorized vision screening, conducted within *[insert here a reasonable time as determined by the state]*. For those children who fail the required vision screening, a comprehensive eye examination, performed by a licensed optometrist or physician trained in the provision of comprehensive eye care, shall be required to be obtained by the child's family.

All families of children shall be notified in both written and verbal formats of the results from the school-based vision screening and their responsibilities to provide a follow-up comprehensive eye examination via the school's established parental communication mechanism. Schools providing notification should attempt to provide all communication in a culturally and linguistically appropriate manner.

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 Health and School Readiness Commission

A State Children's Vision Health and 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 be comprised 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, and other members as determined appropriate by the governor.

The Commission shall:

a) 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;
b) pursue opportunities to offer free or low-cost eye exams, using a sliding scale, to students who fail vision screenings and are unable to afford an exam on their own;
c) pursue opportunities to provide geographically accessible opportunities for such examinations;
d) designate an agency to collect data from school health personnel concerning the results of the original screenings, the reports from the comprehensive eye exam, the outreach letters to unresponsive families, and referrals to child protective agencies, and submit the data to the Commission annually;
e) issue an annual report to the secretary of the department of health, the secretary of the department of education, the governor, and the state legislature, with the key findings, including evaluation of cost effectiveness, of the collected data and recommendations for possible modifications to the program;
f) perform other related tasks, as assigned by the governor.

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[51] (Vision In Preschoolers Study Group, 2007)

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